LIFE14 CCA/GR/000389 - AgroClimaWater
Promoting water efficiency and supporting the shift towards a climate resilient agriculture in Mediterranean countries

Deliverable C3.1: Proposal of farm specific Action Plans (GAPs and monitoring measurement equipment)

Action C3: Selection of the pilot farms and formulation of the adaptation strategy for the three F.ORs

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INTRODUCTION

The current deliverable constitutes the presentation of the farm specific Action Plan developed for each of the 10 pilot farms of each sub-basin (Voukolies-Maleme, Havgas-Milatos, Agri). These Action Plans aim to enhance adaptive capacity by rationalizing water management in terms of both quantity and quality and more specifically to:

- Rationalize irrigation
- Optimize rainwater use
- Minimize water discharges and runoff
- Increase soil water retention and avoid deep percolation
- Minimize evaporation from soil and transpiration by plants
- Improve the use of applied substance (fertilizers, insecticides, pesticides)

The selection of pilot farms was carefully made for each sub-basin based on the methodologies presented in detail in Section 2. After the farm selection procedure, a farm specific action plan was compiled for each action plan containing:

1. Description of farm: This section of action plan contains information retrieved mainly by Action C2, which resulted from processing of data collected through the 1st and 2nd AWMS forms including some general descriptive characteristics (farmer name, crop, coordinates, size) and information related to water management and cultivation practices currently applied (irrigation method, fertilizing, orchard management, plant protection, mean crop yield etc.). Additional important characteristics recorded during the on-site visits are also mentioned, if needed.
2. Description of practices and interventions scheduled to be applied: According to farm specific characteristics information collected below and taking into account the good agricultural practices proposed in the context of LIFE AGROCLIMAWATER project a farm tailor-made list of practices and interventions, accompanied by a description, was compiled for each farm.
3. Monitoring: In order to investigate the performance of practices and interventions proposed for each farms, a monitoring schedule was compiled in which the appropriate equipment is also described.

1. SELECTION OF PILOT FARMS

1.1 Introduction

The selection of ten farms per pilot area for demonstration purposes is a key procedure within the LIFE-AgroClimaWater project, since these farms will be the nucleus for important Implementation (C) and Monitoring (D) Actions. The 10 pilot farms for each sub-basin are selected among the 100 farms recorded in the context of Action A1 and presented in Deliverable A1.3. Since some of those farms were found to be located outside of the sub-basin's domain, they were substituted by other farms and the final farms list is presented in Annex. Will be close to what is considered representative of the current status in the area

A. Will include different of the most common cases (i.e. organic and conventional, irrigated and rainfed, etc.)
B. Will belong to farmers that are willing to accept interventions to their farms with no restrictions
C. Will be appropriate for demonstration purposes (ease of access)

Although these general criteria should apply in all areas, the fact that the present status is different in each one of them, as analytically described in the deliverable of Action C.2, and the fact that different crops should be selected within each area, leads to the necessity of having a set of area specific criteria that may not be applicable, or be of different degree of importance in different areas or different crops within each area. Therefore, a general outline of selection phases which are common for all three areas has been developed, while specific criteria for each area and crop will be used within each phase in different areas.

1.1 Selection of pilot farms in Cretan sites

1.1.1 General outline of the selection procedure in Cretan sites

The selection procedure was performed in 4 steps, The general description of each step was as follows:

- STEP 1: Define the target of number of orchards for each crop, within each area, depending on descriptions in the proposal of the project
- STEP 2: Use the mandatory criteria, as described in the project proposal for defining the number of orchards per crop, area and criterion (i.e. number of organic orchards, number of irrigated orchards, etc.
- STEP 3: Exclusion of non-representative orchards. As example, orchards with young and non-productive trees, or orchards with extreme deviations from the typical management of the area had to be excluded, if they were considered as non-typical for the area.
- STEP 4: Defining the target orchards in steps 1-3, the assistance of FOR agronomists was used in order to limit the existing list, incorporating the final two mandatory criteria: 1) how cooperative each farmer was so far and 2) the ease of access to the orchard, which is important for demonstration purposes. Based on all the above, a list of farms that had to be visited by IOTSP scientific team was defined (about 20-25 out of the 100 orchards in each area) and the final selection was performed based on scoring and evaluation during the on-site visits.

1.1.2 Analysis and outcome of the evaluation procedure for Cretan sites

STEP 1: The slots for the 10 orchards per area had to be initially divided on a per crop basis. Since in Havgas-Milatos sub-basin the only pilot crop was olive, the 10 slots had to be dedicated to this single crop. In Voukolies-Maleme sub-basins, given that the crop ratio according to acreage was 5.7:1 (olives:citrus), and given that the typical management (organic vs. conventional and irrigated vs. rainfed) was less variable for citrus as compared to olives, it was decided that citrus should occupy 2 out of 10 slots in this area. Therefore, the final slot layout for crops in each area was:

- Havgas-Milatos: 10 olive orchards
- Voukolies-Maleme: 8 olive orchards and 2 citrus orchards (1 orange + 1 lemon)

Since citrus orchards do not represent a single crop, it was decided that 2 crops could be included in the 2 pilot orchards: one orange tree orchard representing the traditional status and the crop occupying the highest acreage and one lemon tree orchard, representing the current trend for new citrus plantings in the area.

STEP 2: The mandatory criteria as described in different parts of the proposal were: 1) the inclusion of both organic and conventional farms, 2) the inclusion of both irrigated and rainfed farms, and 3) the inclusion of orchards in areas with higher slope in order to demonstrate extra practices for reducing soil erosion. All 3 criteria were taken into account in both areas for olive trees. However, for citrus orchards, the following facts were considered: 1) the survival of a citrus crop under the climatic conditions of Crete requires irrigation, 2) the typical management of citrus, due to higher N requirements is conventional instead of organic (organic farms are more abandoned than fully managed), and 3) there is a clear distribution according to landscape in the area of Voukolies-Maleme sub-basins, with citrus occupying lowland with deeper and more fertile soils and olives occupying the higher slope areas in less fertile soils. Based on the above, the representative scheme for citrus orchards to be selected was decided to be conventional management, irrigated and in relatively flat orchards.

Concerning the irrigation management of olive orchards in each pilot area, again there was a clear differentiation. In Voukolies-Maleme sub-basins, the typical recorded status was that of irrigated orchards, since even in orchards recorded as rainfed, there were still the remains of an irrigation systems and existing access to an irrigation network, which could still be used in years of extreme drought if farmers decided that trees were stressed in an extensive degree. On the other hand, in Havgas-Milatos sub-basin, irrigated orchards were limited in the northern part of Havgas-Milatos basin and the typical management status in the largest part of the area was that of rainfed orchards.

As for organic vs conventional management, both cases had to be included in the defined slots in both areas, having more cases of conventional farms in total, as it is the real as well as the recorded situation. It has to be mentioned, that in Havgas-Milatos sub-basin, there was a specific status with farms that according to farmer interviews, used to be conventional when there was irrigation water availability in the past (marginal areas for rainfed management of olive trees), but were converted to organic when irrigation stopped, since the farmers decided that limited yield did not justify the costs for applying typical practices like fertilizing and chemical spraying. This was a situation where there is an interesting challenge to demonstrate if the proposed practices could increase yield in a marginal area for olive tree growing.

Finally, concerning olive tree cultivation in high-slope land, it was decided to dedicate two slots in each area to demonstrate measures to reduce soil erosion.
Based on the above, the slots for different scenarios for the 10 farms in each area was decided to be as follows:

Voukolies-Maleme sub-basins			
Crop	Conventional / Organic	Irrigated / rainfed	Flat / sloppy
Citrus	2 / 0	2 / 0	2 / 0
Olive	6 / 2	6 / 2	6 / 2
Havgas-Milatos sub-basin			
Crop	Conventional / Organic	Irrigated / rainfed	Flat / sloppy
Olive	6 / 4	2 / 8	8 / 2

STEP 3: The FOR agronomists were informed that during the selection procedure of farms that are worth visiting, the following cases had to be excluded:

- Farms with young trees not in full production
- Orchards where use of irrigation water was significantly deviating from the typical recorded situation
- Orchards with planting densities considered as non-typical for the area (too dense or too sparse plantings)
- Orchards with known problems of soil-born or wood diseases (e.g. *Phytophthora* in citrus, or Hesca in olives)

Concerning the fruit yield criterion, most of the selected orchards had to be examples with yield close to the typical recorded situation for the area. Due to the limited number of slots for citrus orchards, this was defined as a mandatory criterion for this crop. However, due to the fact that a great variability was recorded in yield of olive orchards, it was decided that cases of extremely high or extremely low yield was recorded could be considered as potential options for the selection procedure, as long as their low or high productivity was not due to one of the above mentioned reasons (tree age, diseases, extreme densities, etc.). The cases of deviations at the high or the low end of deviation from typical could not occupy more than one slot per pilot area.

STEP 4: The accessibility of each farm and the cooperation of the farmer were initially used as criteria by FOR agronomists to prepare a short list of farms that could be potentially selected as pilot farms. Both criteria, along with all criteria mentioned in steps 1-3, were re-evaluated on-site during the visits of IOTSP personnel and FOR agronomists, with farmers present. Advantages and disadvantages of each case were recorded and evaluated (in a scale of 0-5) in order to reach the final decision for selecting the 10 pilot farms in the area.
Based on the above mentioned procedure, the final list of pilot farms selected in the two Cretan sites are presented in Tables 1 and 2, while their spatial distribution is presented in Fig. 1 and 2.

Table 1. List of the pilot farms selected in Voukolies-Maleme sub-basin.

CITRUS			
Farm	Irrigated	Conventional	Low Slope

Code						
19.C01	✓		✓		✓	
28.C02	✓		✓		✓	
OLIVES						
Farm code	Irrigated	Rainfed	Conventional	Organic	Low Slope	High Slope
01.01		✓		✓	✓	
02.02		✓	✓		✓	
11.01	✓		✓		✓	
17.01	✓		✓		✓	
18.03	✓			✓		✓
19.02	✓		✓		✓	
24.02	✓		✓		✓	
25.02	✓		✓			✓

Table 2. List of the pilot farms selected in Havgas-Milatos sub-basin.

OLIVES						
Farm code	Irrigated	Rainfed	Conventional	Organic	Low Slope	High Slope
4.00	✓		✓		✓	
8.01		✓	✓		✓	
9.01		✓	✓		✓	
12.03		✓		✓		✓
30.03		✓	✓		✓	
33.02	✓		✓		✓	
34.01		✓		✓	✓	
36.01		✓	✓		✓	
40.01		✓		✓		✓
40.02		✓		✓	✓	

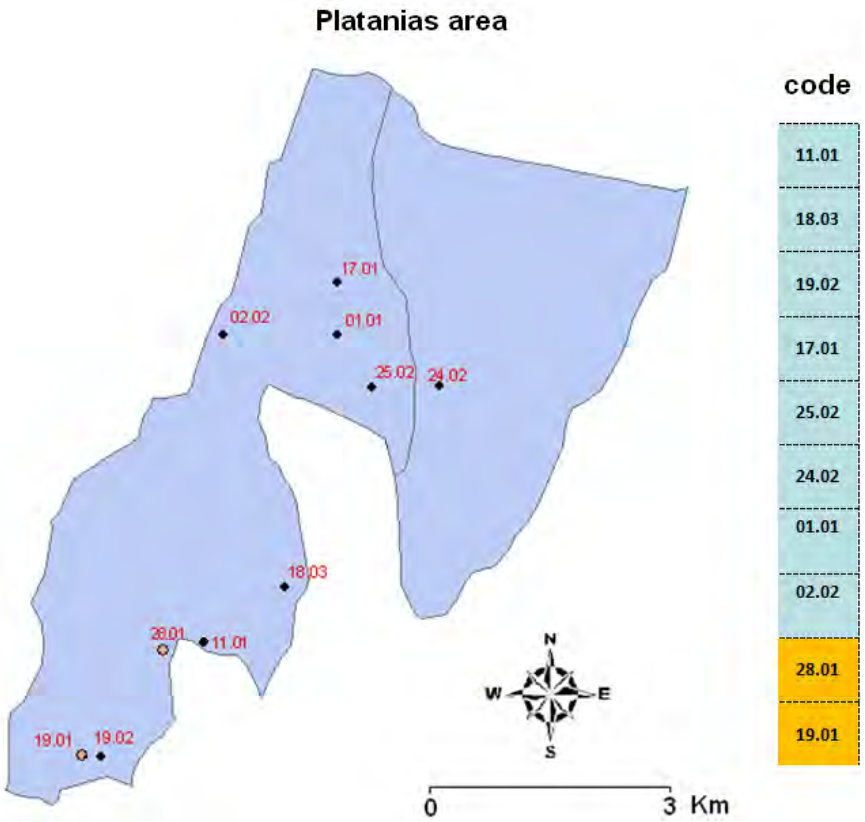


Fig. 1. The selected 10 pilot farms in Voukolies-Maleme sub-basins with the corresponding codes (blue colour represents olive trees while yellow citrus).

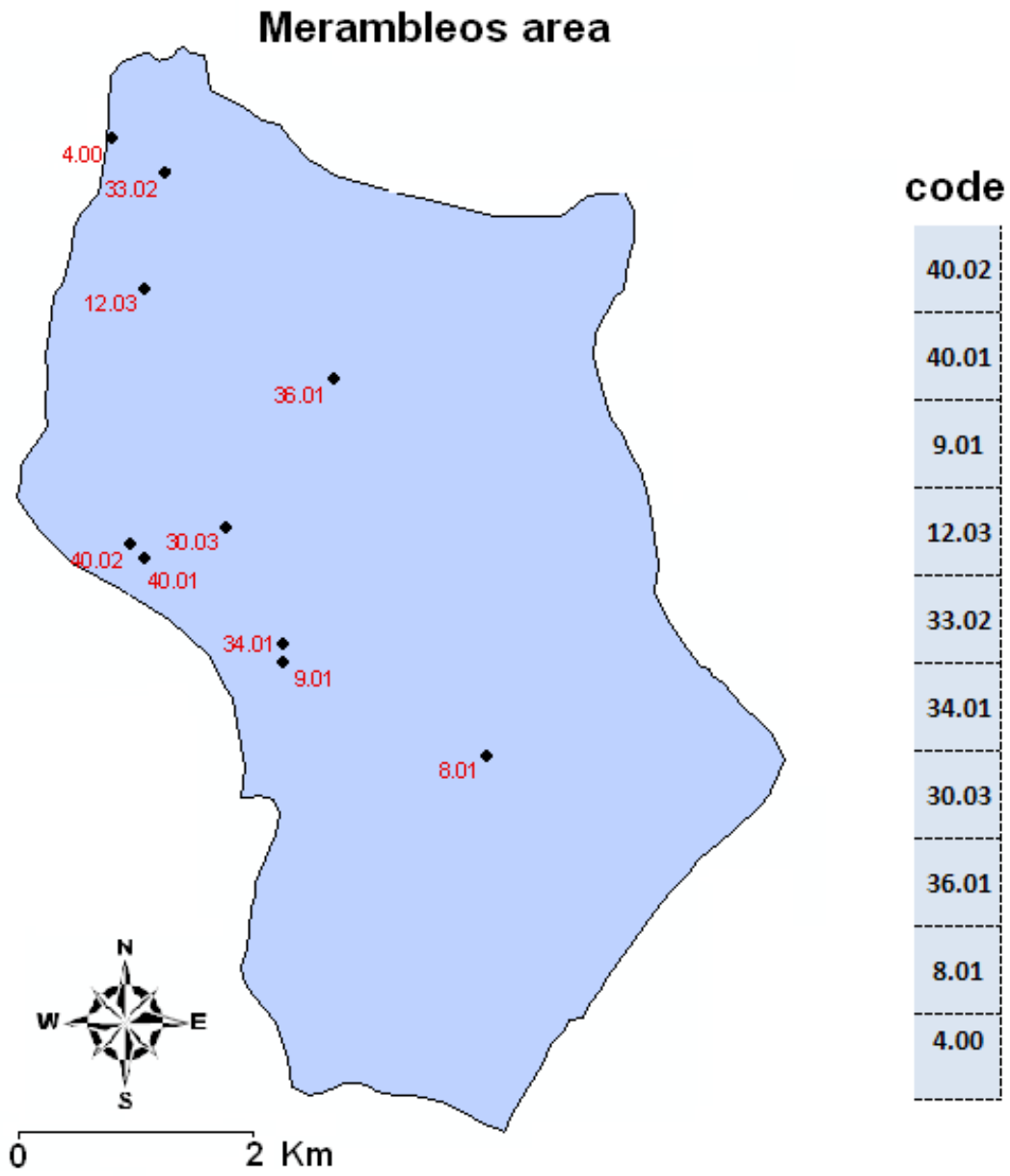


Fig. 2. The selected 10 pilot farms in Havgas-Milatos sub-basin with the corresponding codes.

1.1.3 Selection of pilot farms in the Italian site

In a similar manner, a two stage evaluation process was applied for the selection of the 10 pilot farms within the 100 farms selected in the Agri sub-basin as written below.

STEP 1: Depending on the variability of different cases and the importance of different crops, they were distributed in pilot slots as follows: 3 peach orchards, 2 apricot orchards, 2 citrus orchards and 3 olive groves.

STEP 2: The mandatory criteria, defined in the proposal, followed for the selection were:

A. Irrigation: e.g. irrigated and rainfed orchards will be included for olives. Only irrigated for all other crops.
B. Management: e.g. organic and conventional orchards will be included for olives, only conventional for peach (because of the unique organic peach orchard was affected by Sharka disease), apricot and citrus (because of the unique organic citrus orchard was non-productive (1st date of planting 2015).

STEP 3: Non-representative fields were excluded. Factors that could be set for excluding fields:
1. Tree age: Non-productive orchards have been excluded
2. Fruit yield: orchards with extremely high or low yields have been excluded
3. Water use: orchards deviating from typical water use (close to min and max values) have been excluded
4. Planting densities: e.g. low planting densities are excluded as they do not represent the current trends and the future status in peach cultivation.
5. Diseases: the presence of some diseases (e.g. Sharka disease) could be the reason of eradication of entire parcel. In order to avoid the risk of lose a pilot site, orchards with an high spread of disease have been excluded.

STEP 4: Farm visits.
By visiting a farm some criteria were used in order to select the most applicable 10 cases:
Scoring of field (0-5) according to the following criteria:
1. How cooperative the farmer was so far (as judged from FOR's agronomists) and how interested he was on learning/applying new techniques (after a talking with the farmers)
2. Accessibility of the farm: farms should be easily accessible for demonstration purposes.
Orchards with scores 0 and 1 in one of these two parameters have been excluded. For each slot as defined in STEPS 1, 2 and 3, the orchards that fulfill the requirements and had the highest scores have been selected.
The results of the selection process are presented in Fig. 3 and Table 3, while some general characteristics of the pilot farms are presented below:

Slot 1: Irrigated / Conventional / Apricot (parcel 29)
Slot 2: Irrigated / Conventional / Apricot/ (parcel 79)
Slot 3: Irrigated / Conventional/ Citrus/ (parcel 62)
Slot 4: Irrigated / Conventional/ Citrus/ (parcel 44)
Slot 5: Irrigated / Conventional / Peach / (parcel 110)
Slot 6: Irrigated / Conventional/Peach (parcel 84)
Slot 7: Irrigated / Conventional/ Peach (parcel 85)
Slot 8: Irrigated / Organic / Olive orchard (parcel 107)
Slot 9: Irrigated / Conventional / Olive orchard/ (parcel 101)
Slot 10: Rainfed / Organic / Olive orchard (parcel 97)

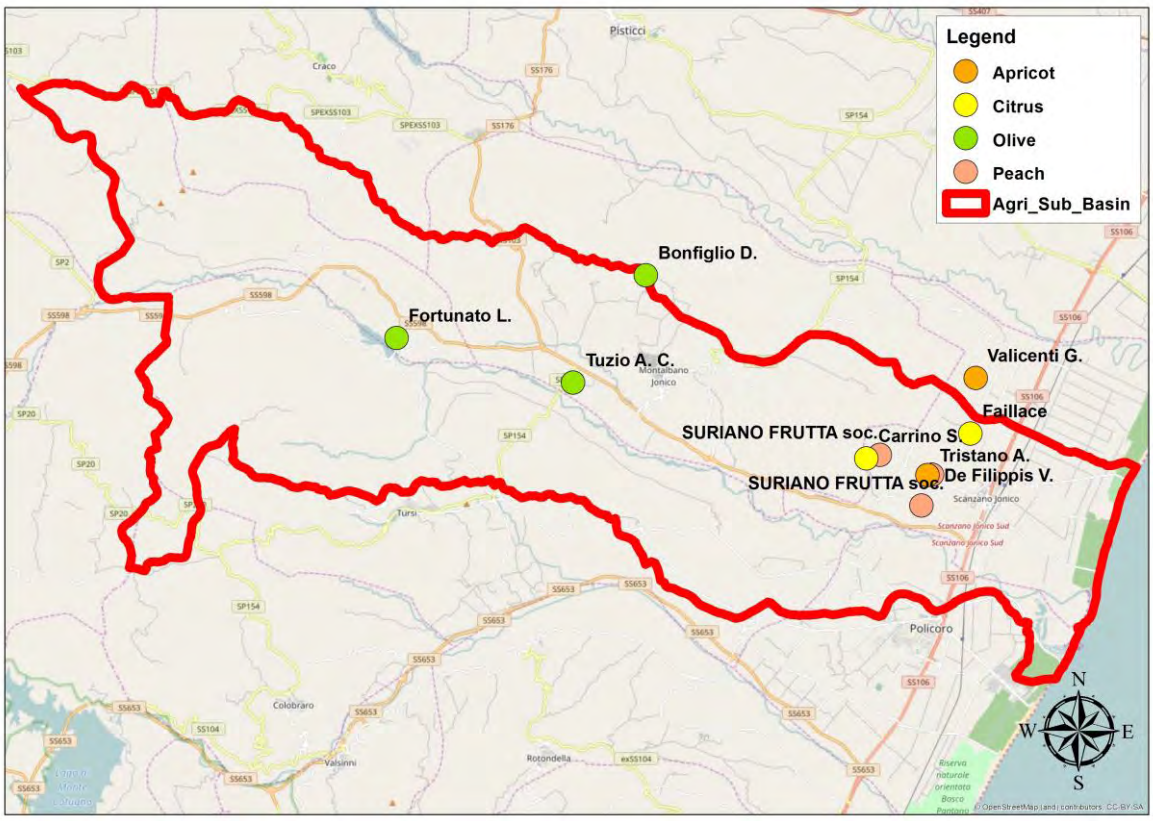


Fig. 3. Map of the pilot sites in the pilot sub-basin of Agri.

Table 3. List of the pilot sites in Agri sub-basin.

N°	Crop	Cultivar	Farmer	Note
1	Apricot	ORANGE RUBIS	Tristano A.	
2	Apricot	MOGADOR	Valicenti G.	
3	Citrus	Orange, NEW ALL	Faillace	
4	Citrus	Clementine	Carrino S.	
5	Peach	Sagittaria	De Filippis V.	
6	Peach	Nectarine, ZINCAL 3	SURIANO FRUTTA soc.	
7	Peach	Nectarine, ZINCAL 8	SURIANO FRUTTA soc.	
8	Olive	Ogliarola	Bonfiglio D.	Organic management
9	Olive	Coratina	Tuzio A. C.	
10	Olive	Ogliarola	Fortunato L.	Organic management

2. Action plans for the pilot farms of Voukolies and Maleme sub-basins

2.1 Pilot farm 1 (number code 11.01)

Farm Description

- Farmer / Manager: Thomakis Stylianos
- Crop: Olive
- Coordinates: Latitude 482590.48, Longitude 3925255.01.
- Size: 0.4 ha / 80 trees
- Tree age: 36 years
- Water management: Irrigated / drip irrigation
- Agrochemicals management: Conventional farm
- Mean yield: 7,5 tn/ha (considered typical for the area)
- Annual irrigation applied (empirical application):
    - 25 mm/year (very low compared to actual needs)
- Fertilizing:
    - Nitrogen: NO
    - Phosphorus: NO
    - Potassium: NO
    - Boron: NO
- Fertigation: NO
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: YES
    - Cover crops: NO
    - Grazing: NO
    - Pruning: Yes (1 per year / winter)
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: 2 (typical for the area)

Based on the above data, the farm is an irrigated one, although application of irrigation water is minimal, despite the fact that there are no limitations of water availability. It has been selected as a conventional olive orchard with typical yield for the area, where most of the proposed practices have not been applied (typical situation in most orchards according to the existing reports of Action C.2). Moreover, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion. An overview of farm location and a photo from the visit is presented in Fig. 4.

Fig. 4. Location overview and photo from visit to farm 11.01 in Voukolies-Maleme sub-basin

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Already applied in the control plot by the farmer. Periodic application of chemical weed control by the farmer will not be applied in the demonstration plot.
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.

5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as over-pruned and therefore the expected impact of winter pruning on minimizing water losses is not expected to be high.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected light pruning, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.
9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. All means of nutrient application (soil application, foliar application and fertigation) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
11. Fertigation: Not applied by the farmer in the control plot. The setup for the incorporation of a fertigation system will be installed in the orchard. Initial tests during spring 2017 will demonstrate if the irrigation network can support a low cost alternative (venturi system), or if a fertigation tank is needed. Depending on climatic restrictions of each year, the fertigation system will be used as a way to overcome common fertilizing issues such as: a) application of nitrogen in years with long dry periods during late winter and early spring, that do not favor soil application. b) increased efficiency of potassium uptake by the trees, which is limited even in irrigated orchards when soil application is practiced in years with long dry periods.
12. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application.
13. Irrigation network: Based on the existing irrigation network setup in the orchard, it was decided to introduce a separate irrigation network in the demonstration plot. Otherwise, monitoring of irrigation would not be possible based on the existing setup. The installation of the irrigation network will be implemented in the first half of spring 2017. Volumetric valves will be introduced in the demonstration plots in order to minimize water losses.
14. Application of irrigation based upon meteorological data / Deficit irrigation: A regulated deficit irrigation scheme will be applied in the

demonstration plot, based upon meteorological data and monitoring sensors. Since the amount of irrigation water applied by the farmer is already low, no great savings, if any, in the total amount of water applied are expected. However, avoidance of water stress in critical growth stages will be the key goal, along with limitation of water losses through deep percolation. Application of irrigation in demonstration plot will be practiced by FOR agronomists.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Recording of irrigation water use: Two water meters will be installed in order to record irrigation water usage (FOR agronomists) in control and demonstration plots after each irrigation event.
9. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

2.2 Pilot farm 2 (number code 18.03)

Farm Description

- Farmer / Manager: Spyridoula Kariotaki
- Crop: Olive
- Coordinates: Latitude 483638.85, Longitude 3925999.56.
- Size: 0.4 ha / 152 trees
- Tree age: 31 years
- Water management: Irrigated / drip irrigation

- Agrochemicals management: Organic farm
- Mean yield: 15 tn/ha (considered high for organic farm, needs to be monitored)
- Annual irrigation applied (empirical application):
    - 25 mm/year (very low compared to actual needs)
- Fertilizing:
    - Nitrogen (N): 60 kg/ha
    - Phosphorus (P_2O_5): 60 kg/ha
    - Potassium (K_2O): 560 kg/ha (high amount / needs to be monitored)
    - Boron: NO
- Fertigation: NO
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: YES (1/year)
    - Cover crops: NO
    - Grazing: NO
    - Pruning: Yes (1 per year / winter)
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: 0 (typical if fruit fly control is covered by the national program)

Based on the above data, the farm is an irrigated one, although application of irrigation water is minimal, despite the fact that there are no limitations of water availability. It has been selected as an organic olive orchard with yield that is considered high for the area and needs to be monitored (not typical for an organic farm not adequately irrigated). Moreover, the reported yield does not correspond to the observed status of the trees with minimal growth of shoots. Therefore, it might represent an example of exhausted trees in terms of resources, which is worth to improve, since this kind of trees might be more venerable to environmental stresses, including water stress. Most of the proposed practices have not been applied (typical situation in most orchards according to the existing reports of Action C.2). Moreover, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. However, the most important criterion for the selection of this orchard was that it was located in a sloppy area with signs of erosion and will be used for demonstrating measures to reduce surface runoff. An overview of farm location is presented in Fig. 5.

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Already applied in the control plot by the farmer.
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.

4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees had minimal new growth and a not very dense canopy. Therefore the expected impact of winter pruning on minimizing water losses is not expected to be high, at least during the first year.

Fig. 5. Location overview of farm 18.03 in Voukolies-Maleme sub-basin

6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected minimal pruning, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.
9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.

10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. All means of nutrient application (soil application, foliar application and fertigation) will be used in order to optimize nutrient use efficiency, as analyzed below. Application of appropriate fertilizing is considered a critical parameter for this orchard, based upon the visual status of the trees.
11. Fertigation: Not applied by the farmer in the control plot. The setup for the incorporation of a fertigation system will be installed in the orchard. Initial tests during spring 2017 will demonstrate if the irrigation network can support a low cost alternative (venturi system), or if a fertigation tank is needed. Depending on climatic restrictions of each year, the fertigation system will be used as a way to overcome common fertilizing issues such as: a) application of nitrogen in years with long dry periods during late winter and early spring, that do not favor soil application. b) increased efficiency of potassium uptake by the trees, which is limited even in irrigated orchards when soil application is practiced in years with long dry periods.
12. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application.
13. Irrigation network: Based on the existing irrigation network setup in the orchard, it was decided to introduce a separate irrigation network in the demonstration plot. Otherwise, monitoring of irrigation would not be possible based on the existing setup. The installation of the irrigation network will be implemented in the first half of spring 2017. Volumetric valves will be introduced in the demonstration plots in order to minimize water losses.
14. Application of irrigation based upon meteorological data / Deficit irrigation: A regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data and monitoring sensors. Since the amount of irrigation water applied by the farmer is already low, no great savings, if any, in the total amount of water applied are expected. However, avoidance of water stress in critical growth stages will be the key goal, along with limitation of water losses through deep percolation. Application of irrigation in demonstration plot will be practiced by FOR agronomists.
15. Reduction of surface runoff: Means of physical reduction of surface runoff will be introduced along the contour lines in the orchard. Establishment is expected to be implemented during spring 2017.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for

monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.

4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Recording of irrigation water use: Two water meters will be installed in order to record irrigation water usage (FOR agronomists) in control and demonstration plots after each irrigation event.
9. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.
10. Surface runoff: Traps for monitoring the amount of surface runoff will be introduced. Measurements will include 3 consecutive winters.

2.3 Pilot farm 3 (number code 19.02)

Farm Description

- Farmer / Manager: Mamidakis Ioannis
- Crop: Olive
- Coordinates: Latitude 481172.65, Longitude 3923860.93.
- Size: 0.6 ha / 150 trees
- Tree age: 11 years
- Water management: Irrigated / drip irrigation
- Agrochemicals management: Conventional farm
- Mean yield: 6.7 tn/ha (considered typical for the area)
- Annual irrigation applied (empirical application):
    - Variable depending on water availability of the network. Not irrigated last year.
- Fertilizing:
    - Nitrogen (N): 157 kg/ha
    - Phosphorus (P_2O_5): 52.5 kg/ha
    - Potassium (K_2O): 105 kg/ha
    - Boron: NO
- Fertigation: NO
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: YES (1)
    - Cover crops: NO

- Grazing: NO
- Pruning: Yes (1 per year / winter)
- Shredding of prunings: NO

- Plant protection
  - Number of applications per year: 1 (typical for the area)

Based on the above data, the farm is an irrigated one, although application of irrigation water is variable and due to its location is greatly affected by the availability of water in the public irrigation network. As an extreme example, during the summer of 2016, there was no water availability in the network and the trees were significantly stresses. Varying the management of water application from none to partially irrigated can greatly affect orchard productivity and this poses a critical challenge in this field. There is the possibility of access to irrigation water through a private well and this is an option that will be considered during the project, since it may resolve the existing problem.

It has been selected as a conventional olive orchard with typical yield for the area, where most of the proposed practices have not been applied (typical situation in most orchards according to the existing reports of Action C.2). Moreover, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. Apart from the water stress issues, according to visual evaluation during the selection procedure, trees seemed to be well managed in terms of pruning and nutrient application. However, based on recorded data, fertilizer application might be in high rates as compared to typical crop requirements and this has to be monitored and resolved during the project. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion. An overview of farm location is presented in Fig. 6.

Fig. 6. Location overview of farm 19.02 in Voukolies-Maleme sub-basin

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-

growth (minimal number: one per year). Already applied in the control plot by the farmer.

2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as well-pruned and therefore the expected impact of winter pruning on minimizing water losses is not expected to be high.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected light pruning, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.
9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. All means of nutrient application (soil application, foliar application and fertigation) will be used in order to optimize nutrient use efficiency, as analyzed below. The amount of fertilizers used is expected to be reduced.
11. Fertigation: Not applied by the farmer in the control plot. The setup for the incorporation of a fertigation system will be installed in the orchard. Initial tests during spring 2017 will demonstrate if the irrigation network can support a low cost alternative (venturi system), or if a fertigation tank is needed. Depending on climatic restrictions of each year, the fertigation system will be used as a way to overcome common fertilizing issues such as: a) application of nitrogen in years with long dry periods during late winter and early spring, that do not favor soil application. b) increased efficiency of potassium uptake by the trees, which is limited even in irrigated orchards when soil application is practiced in years with long dry periods. The effectiveness of this method depends on resolving the issues of irrigation water availability.
12. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on

leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application.

13. Irrigation network: Based on the existing irrigation network setup in the orchard, it was decided to introduce a separate irrigation network in the demonstration plot. Otherwise, monitoring of irrigation would not be possible based on the existing setup. The installation of the irrigation network will be implemented in the first half of spring 2017. Volumetric valves will be introduced in the demonstration plots in order to minimize water losses. The source of irrigation water should be changed in order to reduce year to year variations. The availability of water in an existing well is a good option for this orchard.
14. Application of irrigation based upon meteorological data / Deficit irrigation: A regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data and monitoring sensors. Since the amount of irrigation water applied by the farmer is already low and variable, no great savings, if any, in the total amount of water applied are expected. However, if water availability limitations are overcome, then avoidance of water stress in critical growth stages and reduction of irrigation status from year to year will be favorable for this orchard case. Application of irrigation in demonstration plot will be practiced by FOR agronomists.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.

8. Recording of irrigation water use: Two water meters will be installed in order to record irrigation water usage (FOR agronomists) in control and demonstration plots after each irrigation event.
9. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

2.4 Pilot farm 4 (number code 17.01)

Farm Description

- Farmer / Manager: Kantilaki Aikaterini
- Crop: Olive
- Coordinates: Latitude 484293.81, Longitude 3929802.68.
- Size: 2 ha / 400 trees
- Tree age: 66 years
- Water management: Irrigated / drip irrigation
- Agrochemicals management: Conventional farm
- Mean yield: 7,5 tn/ha (considered typical for the area)
- Annual irrigation applied (empirical application):
    - 50 mm/year (low compared to actual needs)
- Fertilizing:
    - Nitrogen (N): 108 kg/ha
    - Phosphorus (P_2O_5): 36 kg/ha
    - Potassium (K_2O): 72 kg/ha
    - Boron: NO
- Fertigation: NO
- Foliar application of nutrients: YES
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: YES (1)
    - Cover crops: NO
    - Grazing: NO
    - Pruning: Yes (1 per year / winter)
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: None recorded (typical if fruit fly control is covered by the national program).

Based on the above data, the farm is an irrigated one, although application of irrigation water is low, despite the fact that there are no limitations of water availability. It has been selected as a conventional olive orchard with typical yield for the area, where most of the proposed practices have not been applied (typical situation in most orchards according to the existing reports of Action C.2). Moreover, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. According to visual evaluation during the selection procedure, trees seemed to be well managed in terms of pruning and nutrient application, while based on the existing records the applied amounts of fertilizers seem to be close to the typical crop requirements, with the exception of B. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion. An overview of farm location and a photo from the visit is presented in Fig. 7.

Fig. 7. Location overview and photo from visit to farm 17.01 in Voukolies-Maleme sub-basin

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Already applied in the control plot by the farmer. Periodic application of chemical weed control by the farmer will not be applied in the demonstration plot.
2. No weed control during winter (October − first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot. However, application of herbicides has reduced the indigenous flora of the orchard.

3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as well-pruned and therefore the expected impact of winter pruning on minimizing water losses is not expected to be high.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected light pruning, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.
9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. All means of nutrient application (soil application, foliar application and fertigation) will be used in order to optimize nutrient use efficiency, as analyzed below.
11. Fertigation: Not applied by the farmer in the control plot. The setup for the incorporation of a fertigation system will be installed in the orchard. Initial tests during spring 2017 will demonstrate if the irrigation network can support a low cost alternative (venturi system), or if a fertigation tank is needed. Depending on climatic restrictions of each year, the fertigation system will be used as a way to overcome common fertilizing issues such as: a) application of nitrogen in years with long dry periods during late winter and early spring, that do not favor soil application. b) increased efficiency of potassium uptake by the trees, which is limited even in irrigated orchards when soil application is practiced in years with long dry periods.
12. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application.
13. Irrigation network: Based on the existing irrigation network setup in the orchard, it was decided to introduce a separate irrigation network in the demonstration plot. Otherwise, monitoring of irrigation would not be possible based on the existing setup. The installation of the irrigation network will be

implemented in the first half of spring 2017. Volumetric valves will be introduced in the demonstration plots in order to minimize water losses.

14. Application of irrigation based upon meteorological data / Deficit irrigation: A regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data and monitoring sensors. Since the amount of irrigation water applied by the farmer is already low, no great savings, if any, in the total amount of water applied are expected. However, avoidance of water stress in critical growth stages will be the key goal, along with limitation of water losses through deep percolation. Application of irrigation in demonstration plot will be practiced by FOR agronomists.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Recording of irrigation water use: Two water meters will be installed in order to record irrigation water usage (FOR agronomists) in control and demonstration plots after each irrigation event.
9. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

2.5 Pilot farm 5 (number code 25.02)

Farm Description

- Farmer / Manager: Paraskakis Emmanouel
- Crop: Olive
- Coordinates: Latitude 484725.26, Longitude 3928502.94.

- Size: 0.4 ha / 80 trees
- Tree age: 16 years
- Water management: Irrigated / drip irrigation
- Agrochemicals management: Conventional farm
- Mean yield: 7,5 tn/ha (considered typical for the area)
- Annual irrigation applied (empirical application):
    - 38 mm/year (very low compared to actual needs)
- Fertilizing:
    - Nitrogen (N): 44 kg/ha
    - Phosphorus (P_2O_5): 60 kg/ha
    - Potassium (K_2O): 60 kg/ha
    - Boron: NO
- Fertigation: NO
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: YES
    - Weed mowing: NO
    - Cover crops: NO
    - Grazing: NO
    - Pruning: Yes (1 per year / winter)
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: 1 (typical for the area)

Based on the above data, the farm is an irrigated one, although application of irrigation water is minimal, despite the fact that there are no limitations of water availability. It has been selected as a conventional olive orchard with typical yield for the area, where most of the proposed practices have not been applied (typical situation in most orchards according to the existing reports of Action C.2). Moreover, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. However, the most important feature of this certain orchard is that it represents a case where soil tillage is applied in a sloppy area, greatly enhancing the risk of erosion. Therefore, it will provide the possibility of presenting the advantages of no-tillage, along with application of preventive measures against soil erosion. An overview of farm location and a photo from the visit is presented in Fig. 8.

Fig. 8. Location overview and photo from visit to farm 25.02 in Voukolies-Maleme sub-basin

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Weed control is currently practiced by soil tillage in control plots.
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Not applied in control plots.
5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as over-pruned and therefore the expected impact of winter pruning on minimizing water losses is not expected to be high.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected light pruning, impact is not expected to be high.

7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.
9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. All means of nutrient application (soil application, foliar application and fertigation) will be used in order to optimize nutrient use efficiency, as analyzed below.
11. Fertigation: Not applied by the farmer in the control plot. The setup for the incorporation of a fertigation system will be installed in the orchard. Initial tests during spring 2017 will demonstrate if the irrigation network can support a low cost alternative (venturi system), or if a fertigation tank is needed. Depending on climatic restrictions of each year, the fertigation system will be used as a way to overcome common fertilizing issues such as: a) application of nitrogen in years with long dry periods during late winter and early spring, that do not favor soil application. b) increased efficiency of potassium uptake by the trees, which is limited even in irrigated orchards when soil application is practiced in years with long dry periods.
12. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application.
13. Irrigation network: Based on the existing irrigation network setup in the orchard, it was decided to introduce a separate irrigation network in the demonstration plot. Otherwise, monitoring of irrigation would not be possible based on the existing setup. The installation of the irrigation network will be implemented in the first half of spring 2017. Volumetric valves will be introduced in the demonstration plots in order to minimize water losses.
14. Application of irrigation based upon meteorological data / Deficit irrigation: A regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data and monitoring sensors. Since the amount of irrigation water applied by the farmer is already low, no great savings, if any, in the total amount of water applied are expected. However, avoidance of water stress in critical growth stages will be the key goal, along with limitation of water losses through deep percolation. Application of irrigation in demonstration plot will be practiced by FOR agronomists.
15. Reduction of surface runoff: Means of physical reduction of surface runoff will be introduced along the contour lines in the orchard. Establishment is expected to be implemented during spring 2017.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Recording of irrigation water use: Two water meters will be installed in order to record irrigation water usage (FOR agronomists) in control and demonstration plots after each irrigation event.
9. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.
10. Surface runoff: Traps for monitoring the amount of surface runoff will be introduced. Measurements will include 3 consecutive winters.

2.6 Pilot farm 6 (number code 24.02)

Farm Description

- Farmer / Manager: Paraskakis Alexandros
- Crop: Olive
- Coordinates: Latitude 485375.11, Longitude 3928459.89.
- Size: 0.7 ha / 105 trees
- Tree age: 26 years
- Water management: Irrigated / drip irrigation
- Agrochemicals management: Conventional farm
- Mean yield: 5.7 tn/ha (considered low for the area)
- Annual irrigation applied (empirical application):
    - 21 mm/year (very low compared to actual needs)
- Fertilizing:

  - Nitrogen (N): 115 kg/ha
  - Phosphorus (P_2O_5): 29 kg/ha
  - Potassium (K_2O): 57.7 kh/ha
  - Boron: NO
- Fertigation: NO
- Foliar application of nutrients: YES
- Organic material applied: NO
- Orchard Management:
  - Soil tillage: YES
  - Weed mowing: NO
  - Cover crops: NO
  - Grazing: NO
  - Pruning: Yes (1 per year / winter)
  - Shredding of prunings: NO
- Plant protection
  - Number of applications per year: 1 (typical for the area)

Fig. 9. Location overview and photo from visit to farm 24.02 in Voukolies-Maleme sub-basin

Based on the above data, the farm is an irrigated one, although application of irrigation water is minimal, despite the fact that there are no limitations of water

availability. It has been selected as a conventional olive orchard with typical yield for the area, where most of the proposed practices have not been applied (typical situation in most orchards according to the existing reports of Action C.2). Moreover, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. Although the farm is ranked in the group of non-high slope orchards, with low risk of erosion, it provides an example of orchard where soil tillage is applied and therefore, it can be used as a case study for providing comparative data between treatments of soil tillage (control) versus no tillage (demonstration) in an orchard with low erosion risk. An overview of farm location and a photo from the visit is presented in Fig. 9.

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Not applied in control plot by the farmer, since weed control is performed by soil tillage.
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Not applied in control plots by the farmer.
5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as well-pruned and therefore the expected impact of winter pruning on minimizing water losses is not expected to be high.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected light pruning, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.
9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. All means of nutrient application (soil application, foliar application and fertigation) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.

11. Fertigation: Not applied by the farmer in the control plot. The setup for the incorporation of a fertigation system will be installed in the orchard. Initial tests during spring 2017 will demonstrate if the irrigation network can support a low cost alternative (venturi system), or if a fertigation tank is needed. Depending on climatic restrictions of each year, the fertigation system will be used as a way to overcome common fertilizing issues such as: a) application of nitrogen in years with long dry periods during late winter and early spring, that do not favor soil application. b) increased efficiency of potassium uptake by the trees, which is limited even in irrigated orchards when soil application is practiced in years with long dry periods.
12. Foliar application of nutrients: Already applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application.
13. Irrigation network: Based on the existing irrigation network setup in the orchard, it was decided to introduce a separate irrigation network in the demonstration plot. Otherwise, monitoring of irrigation would not be possible based on the existing setup. The installation of the irrigation network will be implemented in the first half of spring 2017. Volumetric valves will be introduced in the demonstration plots in order to minimize water losses.
14. Application of irrigation based upon meteorological data / Deficit irrigation: A regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data and monitoring sensors. Since the amount of irrigation water applied by the farmer is already low, no great savings, if any, in the total amount of water applied are expected. However, avoidance of water stress in critical growth stages will be the key goal, along with limitation of water losses through deep percolation. Application of irrigation in demonstration plot will be practiced by FOR agronomists.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.

6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Recording of irrigation water use: Two water meters will be installed in order to record irrigation water usage (FOR agronomists) in control and demonstration plots after each irrigation event.
9. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

2.7 Pilot farm 7 (number code 01.01)

Farm Description

- Farmer / Manager: Vagionaki Georgia
- Crop: Olive
- Coordinates: Latitude 480430.23, Longitude 3925776.48.
- Size: 1 ha / 220 trees
- Tree age: 46 years
- Water management: Non-irrigated
- Agrochemicals management: Organic farm
- Mean yield: 10 tn/ha (considered as high for the area)
- Annual irrigation applied:
    - 0 mm/year (although there is an irrigation network available)
- Fertilizing:
    - Nitrogen (N): 30 kg/ha
    - Phosphorus (P_2O_5): 30 kg/ha
    - Potassium (K_2O): 30 kg/ha
    - Boron: YES
- Fertigation: Not applicable
- Foliar application of nutrients: NO
- Organic material applied: YES
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: YES
    - Cover crops: NO
    - Grazing: NO
    - Pruning: Yes (1 per year / winter)
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: 4 (typical for control of fruit fly)

Based on the above data, the farm was selected as a rainfed example of an organic farm with a yield above the average for a rainfed organic farm in the area. This demonstrates by itself a significant effort by the farmer. Organic matter is applied on a regular basis and will be a good example to monitor the effects of long-term application. However, a significant number of other proposed practices have not been applied (typical situation in most orchards according to the existing reports of Action C.2). Moreover, the orchard has ease of access for a demonstration farm and the

farmer was ranked as having good collaboration so far in the project. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion. An overview of farm location and a photo from the visit is presented in Fig. 10.

Fig. 10. Location overview and photo from visit to farm 01.01 in Voukolies-Maleme sub-basin

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Already applied in the control plot by the farmer.

2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as over-pruned and therefore the expected impact of winter pruning on minimizing water losses is not expected to be high.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected light pruning, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.
9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
11. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application. Depending on soil and leaf analyses data, application of macronutrients (mostly K) might also be applied through the leaves, given that the uptake of K during the high demand period is limited in rainfed orchards.
12. Irrigation network: Despite the fact that the orchard is considered as a rainfed one, an existing irrigation network is available, but not used in most of the years. However, under extreme drought conditions the farmer may intervene and apply water, usually in 1 irrigation event. No work will be performed in the existing network and no water will be applied during the demonstration period. If farmer intervenes during the 3 year period, both control and demonstration plots will receive a single irrigation.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

2.8 Pilot farm 8 (number code 02.02)

Farm Description

- Farmer / Manager: Vagionakis Nikolaos
- Crop: Olive
- Coordinates: Latitude 481082.43, Longitude 3925778.58.
- Size: 2 ha / 480 trees
- Tree age: >30 years
- Water management: Rainfed
- Agrochemicals management: Conventional farm
- Mean yield: 4,5 tn/ha (considered low for the area)
- Annual irrigation applied:
    - 0 mm/year
- Fertilizing:
    - Nitrogen (N): 156 kg/ha
    - Phosphorus (P_2O_5): NO
    - Potassium (K_2O): NO
    - Boron: NO
- Fertigation: Not applicable

- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: NO
    - Cover crops: NO
    - Grazing: NO
    - Pruning: Yes (1 per year / winter)
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: 0 (low)

Fig. 11. Location overview of farm 02.02 in Voukolies-Maleme sub-basin

Based on the above data, the farm is a rainfed one, with a relatively large size for the standards of the area. Given that there was a great variability among size, age and productivity of trees within the farm, the selected part was the most problematic one, due to differentiations in management in recent years (recently added to the owner's property). Therefore, it represents an example of a rainfed orchard with low yield, where its low productivity does not justify (according to farmer's view) the extra cost to apply water. Consequently, it represents a case where appropriate management during the project may be of great impact on orchard productivity. As in all cases, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion. An overview of farm location and a photo from the visit is presented in Fig. 11.

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Not currently applied in the control plot by the farmer.

2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as not-well pruned, although there is a limited growth and a high number of water sprouts.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected light pruning, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.
9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
11. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application. Depending on soil and leaf analyses data, application of macronutrients (mostly K) might also be applied through the leaves, given that the uptake of K during the high demand period is limited in rainfed orchards.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable

2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

2.9 Pilot farm 9 (number code 28.01)

Farm Description

- Farmer / Manager: Antonogiannaki Maria
- Crop: Citrus - Orange
- Coordinates: Latitude 482272.01, Longitude 3925199.70.
- Size: 2 ha / 1000 trees
- Tree age: 36 years
- Water management: Irrigated / drip irrigation
- Agrochemicals management: Conventional farm
- Mean yield: 40 tn/ha (within the typical range)
- Annual irrigation applied (empirical application):
    - 300 mm/year (relatively low compared to crop needs, but typical among the available farms)
- Fertilizing:
    - Nitrogen (N): 117 kg/ha
    - Phosphorus (P_2O_5): NO
    - Potassium (K_2O): 138 kg/ha
- Fertigation: YES
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: YES (2)
    - Cover crops: NO
    - Grazing: NO

- Pruning: Yes (1 per year / winter)
- Shredding of prunings: NO

- Plant protection
  - Number of applications per year: 3 (typical depending on pest problems)

Fig. 12. Location overview and photo from visit to farm 28.01 in Voukolies-Maleme sub-basin

Based on the above data, the farm represents a typical irrigation scheme for the area, with existing fertigation equipment (typical in many citrus orchards) and the general status of the orchard was considered as a well-maintained compared to the average status for the area. A conventional management is applied, which is typical for citrus orchards in the area where farmers still invest a significant effort. As in all cases, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion (typical situation for citrus orchards in the area). An overview of farm location and a photo from the visit is presented in Fig. 12.

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Already applied in the control plot by the farmer.
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Will be applied, at a minimal rate, as needed.
6. Summer pruning: Not to be applied in general, since its effect is estimated as non-important. However, depending on weather and water availability, the situation will be monitored and summer pruning might be applied in case of extreme scenarios, in order to avoid tree stress. Not to be applied at all by the farmer in control plots.
7. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
8. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. All means of nutrient application (soil application, foliar application and fertigation) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
9. Fertigation: Already applied by the farmer in the control plot. The setup for the incorporation of a fertigation system will be installed in the orchard. Initial tests during spring 2017 will demonstrate if the irrigation network can support a low cost alternative (venturi system), or if a fertigation tank is needed. It will be used to cover the needs for key macronutrient like potassium. Depending on climatic restrictions of each year, the fertigation system will also be used as a way to overcome common fertilizing issues such as application of nitrogen in years with long dry periods during late winter and early spring, that do not favor soil application.
10. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (typically Zinc and Manganese) and macronutrients like Magnesium, when soil and leaf analysis data indicate reduced uptake due to antagonism.
11. Irrigation network: Based on the existing irrigation network setup in the orchard, it was decided to introduce a separate irrigation network in the demonstration plot. Otherwise, monitoring of irrigation would not be possible based on the existing setup. The installation of the irrigation network will be implemented in the first half of spring 2017. Volumetric valves will be introduced in the demonstration plots in order to minimize water losses.

12. Application of irrigation based upon meteorological data / Deficit irrigation: A regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data and monitoring sensors. Since the amount of irrigation water applied by the farmer is close to the deficit irrigation regime, no great savings, if any, in the total amount of water applied are expected. However, avoidance of water stress in critical growth stages will be the key goal, along with limitation of water losses through deep percolation. Application of irrigation in demonstration plot will be practiced by FOR agronomists.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Recording of irrigation water use: Two water meters will be installed in order to record irrigation water usage (FOR agronomists) in control and demonstration plots after each irrigation event.
9. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

2.10 Pilot farm 10 (number code 19.01)

Farm Description

- Farmer / Manager: Mamidakis Ioannis
- Crop: Citrus - Lemon
- Coordinates: Latitude 481089.60, Longitude 3923898.58.

- Size: 0.4 ha / 100 trees
- Tree age: 10 years
- Water management: Irrigated / drip irrigation
- Agrochemicals management: Conventional farm
- Annual irrigation applied (empirical application):
    - Variable depending on water availability
- Fertilizing:
    - Nitrogen (N): 117 kg/ha
    - Phosphorus (P_2O_5): NO
    - Potassium (K_2O): 138 kg/ha
- Fertigation: NO
- Foliar application of nutrients: NO
- Organic material applied: YES
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: YES (2)
    - Cover crops: NO
    - Grazing: NO
    - Pruning: Yes (1 per year / winter)
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: 3 (typical depending on pest problems)

Fig. 13. Location overview of farm 19.01 in Voukolies-Maleme sub-basin

Based on the above data, the farm represents the most dynamic citrus crop that attracts the interest of citrus growers for establishing new plantations in Voukolies-Maleme sub-basins. Although the usual irrigation scheme applied by the farmer is considered as typical for the area, problems with water availability may reduce the total amount of water applied. Given the fact that the orchard is adjacent to selected olive farm 19.02, it shares common problems with water availability, which could be solved accessing irrigation water available through a private well and this is an option that will be considered during the project, since it may resolve the existing problem.

Apart from the water availability problems, the farm is well-maintained, has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. According to visual evaluation during the selection procedure, trees seemed to be well managed in terms of pruning and nutrient application. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion, which is typical for citrus farms in the area. An overview of farm location is presented in Fig. 13.

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Already applied in the control plot by the farmer.
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Will be applied, at a minimal rate, as needed.
6. Summer pruning: Not to be applied in general, since its effect is estimated as non-important. However, depending on weather and water availability, the situation will be monitored and summer pruning might be applied in case of extreme scenarios, in order to avoid tree stress. Not to be applied at all by the farmer in control plots.
7. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities. Practice is also applied by the farmer in control plots (manure application).
8. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. All means of nutrient application (soil application, foliar application and fertigation) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
9. Fertigation: Already applied by the farmer in the control plot. The setup for the incorporation of a fertigation system will be installed in the orchard. Initial tests during spring 2017 will demonstrate if the irrigation network can support a low cost alternative (venturi system), or if a fertigation tank is needed. It will be used to cover the needs for key macronutrient like potassium. Depending on climatic restrictions of each year, the fertigation system will also be used as a way to overcome common fertilizing issues such as application of nitrogen in years with long dry periods during late winter and early spring, that do not favor soil application.

10. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (typically Zinc and Manganese) and macronutrients like magnesium, when soil and leaf analysis data indicate reduced uptake due to antagonism.
11. Irrigation network: Based on the existing irrigation network setup in the orchard, it was decided to introduce a separate irrigation network in the demonstration plot. Otherwise, monitoring of irrigation would not be possible based on the existing setup. The installation of the irrigation network will be implemented in the first half of spring 2017. Volumetric valves will be introduced in the demonstration plots in order to minimize water losses. Moreover, the possibility of access to the adjacent well will be investigated during the project (common actions for orchard 19.02)
12. Application of irrigation based upon meteorological data / Deficit irrigation: A regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data and monitoring sensors. Since the amount of irrigation water applied by the farmer is close to the deficit irrigation regime, no great savings, if any, in the total amount of water applied are expected. However, avoidance of water stress in critical growth stages will be the key goal, along with limitation of water losses through deep percolation. Application of irrigation in demonstration plot will be practiced by FOR agronomists.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.

8. Recording of irrigation water use: Two water meters will be installed in order to record irrigation water usage (FOR agronomists) in control and demonstration plots after each irrigation event.
9. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

3. Action plans for the pilot farms of Havgas-Milatos sub-basin

3.1 Pilot farm 1 (number code 40.02)

Farm Description

- Farmer / Manager: Chronakis Ioannis
- Crop: Olive
- Coordinates: Latitude 642141.7267, Longitude 3905767.845.
- Size: 0.4 ha / 96 trees
- Tree age: 56 years
- Water management: Rainfed
- Agrochemicals management: Organic farm
- Mean yield: 3.8 tn/ha (considered typical for the area)
- Annual irrigation applied (no access to irrigation network):
    - 0 mm/year
- Fertilizing:
    - Nitrogen (N): NO
    - Phosphorus (P_2O_5): NO
    - Potassium (K_2O): NO
    - Boron: NO
- Fertigation: N/A
- Foliar application of nutrients: YES
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: NO
    - Cover crops: NO
    - Grazing: NO
    - Pruning: N/A
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: 0 (typical if fruit fly control is applied by the national program)

Based on the above data, the farm is a rainfed one (typical for the area), with no access to irrigation network. It has been selected as a typical low cropping, organic, rainfed olive orchard, where most of the proposed practices have not been applied (typical situation in most orchards according to the existing reports of Action C.2). Yield is greatly affected by water stress during summer, as verified during the on-site visit. Moreover, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion. An overview of farm location and a photo from the visit is presented in Fig. 14.

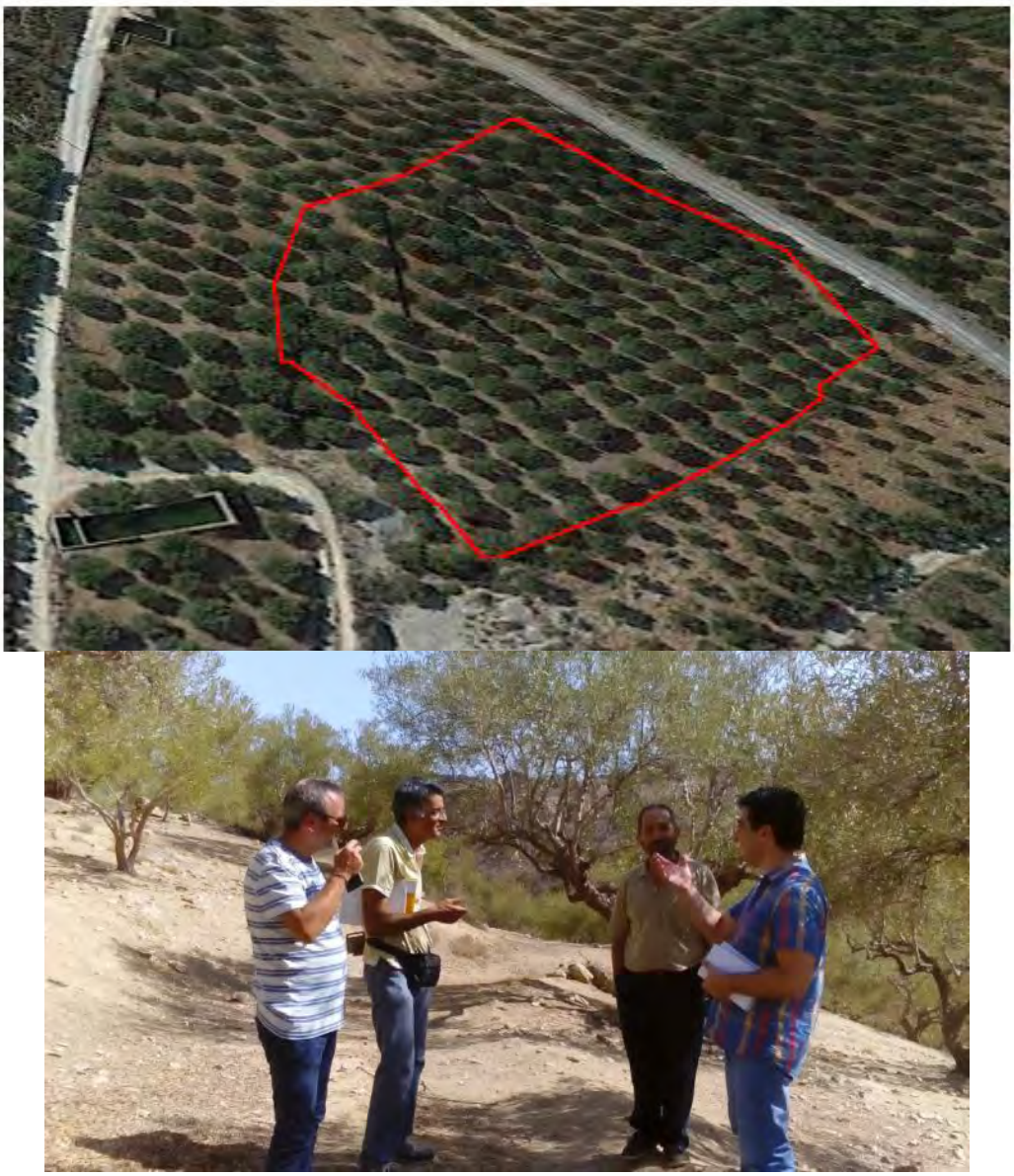


Fig. 14. Location overview and photo from visit to farm 40.02 in Havgas-Milatos sub-basin

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). The need is questionable and will be evaluated on an annual basis, since according to farmer's point of view, typically no weeds are growing during spring due to lack of water.
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot. Weed growth is though limited.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer. Effectiveness needs to be evaluated, since limited growth is observed in the orchard floor in dry years.

4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as over-pruned and therefore the expected impact of winter pruning on minimizing water losses is not expected to be high.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected light pruning, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.
9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
12. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below.
10. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application. Depending on soil and leaf analyses data, application of macronutrients (mostly K) might also be applied through the leaves, given that the uptake of K during the high demand period is limited in rainfed orchards.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil

moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.

4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

3.2 Pilot farm 2 (number code 40.01)

Farm Description

- Farmer / Manager: Chronakis Ioannis
- Crop: Olive
- Coordinates: Latitude 642258.8156, Longitude 3905657.497.
- Size: 0.4 ha / 88 trees
- Tree age: 50 years
- Water management: Rainfed
- Agrochemicals management: Organic farm
- Mean yield: 3.8 tn/ha (considered typical for the area)
- Annual irrigation applied (no access to irrigation network):
    - 0 mm/year
- Fertilizing:
    - Nitrogen (N): NO
    - Phosphorus (P_2O_5): NO
    - Potassium (K_2O): NO
    - Boron: NO
- Fertigation: N/A
- Foliar application of nutrients: YES
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: NO
    - Cover crops: YES
    - Grazing: NO
    - Pruning: YES (winter pruning, once per year)
    - Shredding of prunings: YES
- Plant protection
    - Number of applications per year: 1 (typical for the area)

Based on the above data, the farm is a rainfed one (typical for the area), with no access to irrigation network. It has been selected as a typical low cropping, organic,

rainfed olive orchard, where some of the proposed practices are applied (annual pruning, shredding of prunings, etc), although in a not appropriate way in some cases, while most of other practices are not applied, as it is the typical of the area, despite the fact that they are recommended for rainfed orchards. Yield is greatly affected by water stress during summer, as verified during the on-site visit. Moreover, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. Finally, the most important advantage of the farm is that it is suitable for demonstration of practices recommended for high slope areas, with high risk of erosion. An overview of farm location and a photo from the visit is presented in Fig. 15.

Fig. 15. Location overview and photo from visit to farm 40.01 in Havgas-Milatos sub-basin

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). The need is questionable and will be evaluated on an annual basis, since according to farmer's point of view, typically no weeds are growing during spring due to lack of water.
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot. Weed growth is though limited.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer. Effectiveness needs to be evaluated, since limited growth is observed in the orchard floor in dry years.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as over-pruned and therefore the expected impact of winter pruning on minimizing water losses is not expected to be high.
6. Shredding of prunings: Already applied by farmer in a limited extend, and in a wrong way (application away from the area of active root growth. Will only be applied in demonstration plots, although, due to the expected light pruning, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.
9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
13. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below.
10. Foliar application of nutrients: Already applied by the farmer and will be applied in demonstration plots in a more extensive way, according to actual nutrient requirements. Will be used for application of micronutrients (mostly

Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application. Depending on soil and leaf analyses data, application of macronutrients (mostly K) might also be applied through the leaves, given that the uptake of K during the high demand period is limited in rainfed orchards.

11. Reduction of surface runoff: Means of physical reduction of surface runoff will be introduced along the contour lines in the orchard. Establishment is expected to be implemented during spring 2017.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.
9. Surface runoff: Traps for monitoring the amount of surface runoff will be introduced. Measurements will include 3 consecutive winters.

3.3 Pilot farm 3 (number code 9.01)

Farm Description

- Farmer / Manager: Dinerakis Zaharias
- Crop: Olive
- Coordinates: Latitude 643360.723, Longitude 3904827.734.
- Size: 1 ha / 270 trees
- Tree age: 46 years

- Water management: Rainfed
- Agrochemicals management: Conventional farm
- Mean yield: 4.0 tn/ha (considered typical for the area)
- Annual irrigation applied (no access to irrigation network):
    - 0 mm/year
- Fertilizing:
    - Nitrogen (N): NO
    - Phosphorus (P_2O_5): NO
    - Potassium (K_2O): NO
    - Boron: NO
- Fertigation: N/A
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: NO
    - Cover crops: NO
    - Grazing: NO
    - Pruning: NO
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: 2 (typical for the area)

Fig. 16. Location overview and photo from visit to farm 9.01 in Havgas-Milatos sub-basin

Based on the above data, the farm is a rainfed one (typical for the area), with no access to irrigation network. It has been selected as a typical low cropping, rainfed olive orchard, with minimal interventions from the farmer. This scheme was reported for several rainfed orchards in the area. Moreover, most of the proposed practices are not applied (typical situation in most orchards according to the existing reports of Action C.2). Yield is greatly affected by water stress during summer, as verified during the on-site visit and the non-pruned trees seemed to be severely affected by long dry periods. As in all cases, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion. An overview of farm location and a photo from the visit is presented in Fig. 16.

List of good agricultural practices and interventionss

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). The need is questionable and will be evaluated on an annual basis, since according to farmer's point of view, typically no weeds are growing during spring due to lack of water.
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot. Weed growth is though limited.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer. Effectiveness needs to be evaluated, since limited growth of is observed in the orchard floor in certain years.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.

5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as over-pruned and therefore the expected impact of winter pruning on minimizing water losses is not expected to be high.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected light pruning, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.
9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
14. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below.
10. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application. Depending on soil and leaf analyses data, application of macronutrients (mostly K) might also be applied through the leaves, given that the uptake of K during the high demand period is limited in rainfed orchards.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.

4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

3.4 Pilot farm 4 (number code 12.03)

Farm Description

- Farmer / Manager: Lavrentaki Maria
- Crop: Olive
- Coordinates: Latitude 642259.5622, Longitude 3907792.944.
- Size: <0.4 ha / 60 trees
- Tree age: 86 years
- Water management: Rainfed
- Agrochemicals management: Organic farm
- Mean yield: 5.6 tn/ha (considered within typical limits for the area)
- Annual irrigation applied (no access to irrigation network):
    - 0 mm/year
- Fertilizing:
    - Nitrogen (N): NO
    - Phosphorus (P_2O_5): NO
    - Potassium (K_2O): NO
    - Boron: NO
- Fertigation: N/A
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: YES
    - Cover crops: NO
    - Grazing: NO
    - Pruning: YES (winter)
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: 0 (typical if fruit fly control is applied by the national program)

Based on the above data, the farm is a rainfed one (typical for the area), with no access to irrigation network. It has been selected as a typical low cropping, organic, rainfed olive orchard, where most of the proposed practices have not been applied

(typical situation in most orchards according to the existing reports of Action C.2). Yield is greatly affected by water stress during summer, as verified during the on-site visit. Moreover, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. According to farmer's point of view, limited orchard management actions are applied due to its low productivity, mostly due to water stress. This was the main reason for turning the farm into an organic management scheme, since according to him, cost of conventional interventions is not justified anyway. However, the most important criterion for the selection of this orchard was that it was located in a sloppy area and will be used for demonstrating measures to reduce surface runoff. An overview of farm location and a photo from the visit is presented in Fig. 17.

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Already applied by the farmer in control plots.
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot. Weed growth is though limited.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer. Effectiveness needs to be evaluated, since limited growth is observed in the orchard floor in certain years.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Already applied periodically by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as over-pruned and therefore the expected impact of winter pruning on minimizing water losses is not expected to be high.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected light pruning, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.
9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.

Fig. 17. Location overview and photo from visit to farm 12.03 in Havgas-Milatos sub-basin

10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below.
11. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application. Depending on soil and leaf analyses data, application of macronutrients (mostly K) might also be applied through the leaves, given that the uptake of K during the high demand period is limited in rainfed orchards.

12. Reduction of surface runoff: Means of physical reduction of surface runoff will be introduced along the contour lines in the orchard. Establishment is expected to be implemented during spring 2017.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.
9. Surface runoff: Traps for monitoring the amount of surface runoff will be introduced. Measurements will include 3 consecutive winters.

3.5 Pilot farm 5 (number code 33.02)

Farm Description

- Farmer / Manager: Terzis Georgios
- Crop: Olive
- Coordinates: Latitude 642419.5218, Longitude 3908703.308.
- Size: 0.4 ha / 98 trees
- Tree age: 36 years
- Water management: Irrigated / drip irrigation
- Agrochemicals management: Conventional farm
- Mean yield: 5.0 tn/ha (considered typical for the area)
- Annual irrigation applied (empirical application):
    - Recently converted to irrigated / not enough data available

- Fertilizing:
  - Nitrogen (N): 130 kg/ha
  - Phosphorus (P_2O_5): NO
  - Potassium (K_2O): NO
  - Boron: NO
- Fertigation: Possible (considered by the farmer in the future)
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
  - Soil tillage: YES (not on an annual basis)
  - Weed mowing: YES
  - Cover crops: NO
  - Grazing: NO
  - Pruning: Yes (once every 2 to 3 years)
  - Shredding of prunings: NO
- Plant protection
  - Number of applications per year: 1 (typical for the area)

Based on the above data, the farm is one of the few irrigated ones in the area, having an access to a private borehole. As in most cases of irrigated orchards in the are, quality of irrigation water is very low (saline). The farm was recently converted to an irrigated scheme and not enough data exist on water use, although it is expected to be higher than crop requirements. It is fenced and easily accessed, which is an advantage in this area, since it limits external intervention, such as uncontrolled grazing. It has been selected as a typical irrigated orchard in the area, where most of the proposed practices have not been applied (typical situation in most orchards according to the existing reports of Action C.2). The farmer was ranked as having good collaboration so far in the project. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion. Therefore, despite the fact that tillage is periodically applied, it is not expected to contribute to soil erosion. An overview of farm location and a photo from the visit is presented in Fig. 18.

Fig. 18. Location overview and photo from visit to farm 33.02 in Havgas-Milatos sub-basin

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Since the farm was recently converted to irrigated, the exact strategy of weed control by the farmer in control plots has not be finalized.
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as well-pruned and therefore the expected impact of winter pruning on minimizing water losses is not expected to be high.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected light pruning, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two

applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.

9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. All means of nutrient application (soil application, foliar application and fertigation) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
11. Fertigation: Not applied by the farmer in the control plot, but might be applied in the future (is under consideration for high cropping years). The setup for the incorporation of a fertigation system will be installed in the orchard. Initial tests during spring 2017 will demonstrate if the irrigation network can support a low cost alternative (venturi system), or if a fertigation tank is needed. Depending on climatic restrictions of each year, the fertigation system will be used as a way to overcome common fertilizing issues such as: a) application of nitrogen in years with long dry periods during late winter and early spring, that do not favor soil application. b) increased efficiency of potassium uptake by the trees, which is limited even in irrigated orchards when soil application is practiced in years with long dry periods. Moreover, the application of K through fertigation may reduce the negative effects of salinity.
12. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application.
13. Irrigation network: Based on the existing irrigation network setup in the orchard, it was decided to introduce a separate irrigation network in the demonstration plot. Otherwise, monitoring of irrigation would not be possible based on the existing setup. The installation of the irrigation network will be implemented in the first half of spring 2017. Volumetric valves will be introduced in the demonstration plots in order to minimize water losses.
14. Application of irrigation based upon meteorological data / Deficit irrigation: A regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data and monitoring sensors. Since the amount of irrigation water applied by the farmer is already low, no great savings, if any, in the total amount of water applied are expected. However, avoidance of water stress in critical growth stages will be the key goal, along with limitation of water losses through deep percolation. Application of irrigation in demonstration plot will be practiced by FOR agronomists.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demontration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Recording of irrigation water use: Two water meters will be installed in order to record irrigation water usage (FOR agronomists) in control and demonstration plots after each irrigation event.
9. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

3.6 Pilot farm 6 (number code 34.01)

Farm Description

- Farmer / Manager: Tzagkournis Elefterios
- Crop: Olive
- Coordinates: Latitude 643347.4936, Longitude 3904976.376
- Size: 1.04 ha/ 220 trees
- Tree age: 51 years
- Water management: Rainfed
- Agrochemicals management: Organic farm
- Mean yield: 3.8 tn/ha (typical for the area)
- Annual irrigation applied:
    - 0 mm/year
- Fertilizing:
    - Nitrogen (N): NO
    - Phosphorus (P_2O_5): NO
    - Potassium (K_2O): NO
    - Boron: NO
- Fertigation: Not applicable
- Foliar application of nutrients: NO

- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: YES
    - Cover crops: NO
    - Grazing: YES
    - Pruning: NO
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: 1 (typical for the area)

Fig. 19. Location overview and photo from visit to farm 34.01 in Havgas-Milatos sub-basin

Based on the above data, the farm was selected as a rainfed example of an organic farm with a yield about the average for a rainfed organic farm in the area. Organic matter is not applied on a regular basis. Moreover, the majority of the proposed practices have not been applied (typical situation in most orchards according to the existing reports of Action C.2). The orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion. An overview of farm location and a photo from the visit is presented in Fig. 19.

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Already applied in the control plot by the farmer.
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots,.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.
9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
11. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application. Depending on soil and leaf analyses data, application of macronutrients (mostly K) might also be applied through the leaves, given that the uptake of K during the high demand period is limited in rainfed orchards.
12. Irrigation network: Despite the fact that the orchard is considered as a rainfed one, an existing irrigation network is available, but not used in most of the years. However, under extreme drought conditions the farmer may intervene and apply water, usually in 1 irrigation event. No work will be performed in the existing network and no water will be applied during the demonstration period. If farmer intervenes during the 3 year period, both control and demonstration plots will receive a single irrigation.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

3.7 Pilot farm 7 (number code 30.03)

Farm Description

- Farmer / Manager: Stefanakis Fedon
- Crop: Olive
- Coordinates: Latitude 642904.994, Longitude 3905899.207
- Size: 0.4ha / 108 trees
- Tree age: 46 years
- Water management: Non-irrigated
- Agrochemicals management: Conventional farm
- Mean yield: 6.7 tn/ha (above the average for the area)
- Annual irrigation applied:
    - 0 mm/year (although there is an irrigation network available)
- Fertilizing:
    - Nitrogen (N): NO
    - Phosphorus (P_2O_5): NO
    - Potassium (K_2O): NO
    - Boron: NO

- Fertigation: Not applicable
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: YES
    - Cover crops: NO
    - Grazing: YES
    - Pruning: Yes (1 per year / winter)
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: 2 (typical for the area)

Based on the above data, the farm is a rainfed one, but provides an example of a higher than the average reported yield of rainfed farms in the area. Most of the proposed practices are not applied as in most orchards in the area. As in all cases, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion. An overview of farm location and a photo from the visit is presented in Fig. 20.

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Already applied by the farmer and will continue to be implemented in the demonstration plot
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as not-well pruned also due to the uncontrolled grazing.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected light pruning, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.

9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.

Fig. 20. Location overview and photo from visit to farm 30.03 in Havgas-Milatos sub-basin

10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil

application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.

11. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application. Depending on soil and leaf analyses data, application of macronutrients (mostly K) might also be applied through the leaves, given that the uptake of K during the high demand period is limited in rainfed orchards.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

3.8 Pilot farm 8 (number code 36.01)

Farm Description

- Farmer / Manager: Fragkakis Dimitrios
- Crop: Olive
- Coordinates: Latitude 643761.4961, Longitude 3907071.479
- Size: 0.8ha / 128 trees
- Tree age: 86 years
- Water management: Non-irrigated

- Agrochemicals management: Conventional farm
- Mean yield: 1.9 tn/ha
- Annual irrigation applied:
    - 0 mm/year
- Fertilizing:
    - Nitrogen (N): NO
    - Phosphorus (P_2O_5): NO
    - Potassium (K_2O): NO
    - Boron: NO
- Fertigation: Not applicable
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: NO
    - Cover crops: NO
    - Grazing: YES
    - Pruning: Yes (1 per year / winter)
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: 0

Based on the above data, the farm was selected as a rainfed example of a conventional farm with a yield below the average for the area. In this farm significant amounts of stones exists, a typical situation in Havgas-Milatos sub-basin. According to farmer, this, along with drought has a significant impact to yield and thus cost of typical olive orchard management practices is not justified. Therefore, there is a challenge of proving that productivity can be increased by appropriate management and demonstrate it to farmers in the area with a similar mentality. The majority of the proposed practices have not been applied (typical situation in most orchards according to the existing reports of Action C.2). As in all cases, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion. An overview of farm location and a photo from the visit is presented in Fig. 21.

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Not applied by the farmer and will be implemented in the demonstration plot.
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.

Fig. 21. Location overview and photo from visit to farm 36.01 in Havgas-Milatos sub-basin

5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as not-well pruned.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected problem of stones in soil, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.

9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
11. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application. Depending on soil and leaf analyses data, application of macronutrients (mostly K) might also be applied through the leaves, given that the uptake of K during the high demand period is limited in rainfed orchards.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demonstration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

3.9 Pilot farm 9 (number code 8.01)

Farm Description

- Farmer / Manager: Dinerakis Konstantinos
- Crop: Olive
- Coordinates: Latitude 644967.8897, Longitude 3904092.032
- Size: 0.8ha / 168 trees
- Tree age: 41 years
- Water management: Non-irrigated
- Agrochemicals management: Conventional farm
- Mean yield: 5 tn/ha (within the typical range for the area)
- Annual irrigation applied:
    - 0 mm/year (although there is an irrigation network available)
- Fertilizing:
    - Nitrogen (N): NO
    - Phosphorus (P_2O_5): NO
    - Potassium (K_2O): NO
    - Boron: NO
- Fertigation: Not applicable
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: NO
    - Cover crops: NO
    - Grazing: NO
    - Pruning: Yes (1 per year / winter)
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: 6 (typical for bait spray control of fruit fly)

Based on the above data, the farm was selected as a rainfed example of a conventional orchard with a yield at the upper typical range of rainfed orchards in the area. Trees seem to be adequately managed by the farmer as compared to typical. The majority of the proposed practices have not been applied (typical situation in most orchards according to the existing reports of Action C.2). As in all cases, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion. An overview of farm location and a photo from the visit is presented in Fig. 22.

Fig. 22. Location overview and photo from visit to farm 8.01 in Havgas-Milatos sub-basin

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Not applied by the farmer and will be implemented in the demonstration plot

2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as not-well pruned.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.
9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
11. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application. Depending on soil and leaf analyses data, application of macronutrients (mostly K) might also be applied through the leaves, given that the uptake of K during the high demand period is limited in rainfed orchards.
12. Irrigation network: Despite the fact that the orchard is considered as a rainfed one, an existing irrigation network is available, but not used in most of the years. However, under extreme drought conditions the farmer may intervene and apply water, usually in 1 irrigation event. No work will be performed in the existing network and no water will be applied during the demonstration period. If farmer intervenes during the 3 year period, both control and demonstration plots will receive a single irrigation.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demontration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.
3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

3.10 Pilot farm 10 (number code 4.00)

Farm Description

- Farmer / Manager: Antoniadis Georgios
- Crop: Olive
- Coordinates: Latitude 641590.5379298, Longitude 3909015.8719782
- Size: 0.5 ha / 110 trees
- Tree age: 41 years
- Water management: Irrigated / drip irrigation
- Agrochemicals management: Conventional farm
- Mean yield: 4 tn/ha (typical)
- Annual irrigation applied (empirical application):
    - 70 mm/year (low compared to actual needs, significant problem with water salinity)
- Fertilizing:
    - Nitrogen (N): 80 kg/ha
    - Phosphorus (P_2O_5): NO
    - Potassium (K_2O): NO
    - Boron: NO

- Fertigation: YES
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: NO
    - Weed mowing: YES (1/year)
    - Cover crops: NO
    - Grazing: NO
    - Pruning: Yes (1 per year / winter)
    - Shredding of prunings: NO
- Plant protection
    - Number of applications per year: 1 (typical for control of fruit fly)

Based on the above data, the farm is an irrigated one, although application of irrigation water is variable and due to its location is greatly affected by the availability of water in the public irrigation network. It is very important to mention that the Meramblos costal area in faces the significant problem of salt water intrusion. Thus, the irrigation water derives from groundwater can be characterized as saline water with huge amounts of NaCl. It has been selected as a typical example of conventional saline irrigated olive orchard with typical yield for the area, where many of the proposed practices have not been applied (typical situation in most orchards according to the existing reports of Action C.2). Moreover, the orchard has ease of access for a demonstration farm and the farmer was ranked as having good collaboration so far in the project. Finally, the farm is ranked in the group of non-high slope orchards, with low risk of erosion. An overview of farm location and a photo from the visit is presented in Fig. 23.

Fig. 23. Location overview and photo from visit to farm 4.00 in Havgas-Milatos sub-basin

List of good agricultural practices and interventions

1. Weed mowing: applied during the high water demand season (late spring and summer period). Number of applications will depend on climate and weed re-growth (minimal number: one per year). Already applied in the control plot by the farmer.
2. No weed control during winter (October – first half of spring): Already applied by the farmer and will continue to be implemented in the demonstration plot.
3. Cover crops: Sowing during winter for 3 consecutive years. Mowing of cover crops will be applied at crop flowering period. Not applied in the control plots by the farmer.
4. No soil tillage: Already applied by the farmer and will continue to be implemented in the demonstration plot.
5. Winter pruning: Already applied annually by the farmer and will continue to be applied in the demonstration plot, but based on the guidelines of IOTSP. From the visits to the farm, trees were considered as well-pruned and therefore the expected impact of winter pruning on minimizing water losses is not expected to be high.
6. Shredding of prunings: Not applied by farmer. Will only be applied in demonstration plots, although, due to the expected light pruning, impact is not expected to be high.
7. Summer pruning: Not applied by the farmer. Will be applied in demonstration plot once per year (July), given that: a) significant number of water sprouts are detected, or b) a long drought period may overstress the trees. Therefore, the need and the extend for summer pruning may vary from year to year and will be judged based on tree status and the meteorological data.
8. Application of transpiration-reducing products: Not applied by the farmer in the control plots. Application of kaolin clay on an annual basis. One or two applications (starting at June, depending on weather forecast), are expected to reduce transpiration losses during the summer. No applications during autumn.

9. Application of organic material: Locally available organic materials will be applied 3 times during the project (winter application). The source and amount of organic material may vary from year to year depending on availability. The goal will be to favor the use of balanced compost material, if available in adequate quantities.
10. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. All means of nutrient application (soil application, foliar application and fertigation) will be used in order to optimize nutrient use efficiency, as analyzed below. The amount of fertilizers used is expected to be reduced.
11. Fertigation: Applied by the farmer in the control plot. The setup for the incorporation of a fertigation system will be installed in the orchard. The fertigation system will be used as a way to overcome common fertilizing issues such as: a) application of nitrogen in years with long dry periods during late winter and early spring, that do not favor soil application, b) increased efficiency of potassium uptake by the trees, which is limited even in irrigated orchards when soil application is practiced in years with long dry periods, c) the positive role of potassium to reduce the saline concentration in irrigation water will be investigated.
12. Foliar application of nutrients: Not applied by farmer in control plots. Will be used for application of micronutrients (mostly Boron) if required based on leaf analysis in order to improve uptake efficiency and avoid pollution linked to soil application.
13. Irrigation network: Based on the existing irrigation network setup in the orchard, it was decided to introduce a separate irrigation network in the demonstration plot. Otherwise, monitoring of irrigation would not be possible based on the existing setup. The installation of the irrigation network will be implemented in the first half of spring 2017. Volumetric valves will be introduced in the demonstration plots in order to minimize water losses.
14. Application of irrigation based upon meteorological data / Deficit irrigation: A regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data and monitoring sensors. Since the amount of irrigation water applied by the farmer is already low and variable, no great savings, if any, in the total amount of water applied are expected. However, if water availability limitations are overcome, then avoidance of water stress in critical growth stages and reduction of irrigation status from year to year will be favorable for this orchard case. Application of irrigation in demonstration plot will be practiced by FOR agronomists.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring equipment and procedures will be established in this pilot farm:

1. Recording of applications (control plot): farmers will record the practices applied to control part of the orchard, by filling the relevant forms, presented in another part of this deliverable
2. Recording of applications (demontration plot): FOR agronomists will be recording the application of above mentioned practices by filling similar forms for the demonstration part of the orchard.

3. Recording of soil moisture: Three access tubes will be installed in each part of the field (demonstration and control plots) during spring 2017, for monitoring soil moisture at different soil depths at 3 spots per orchard. Soil moisture recordings will be performed by FOR agronomists at 15 day intervals for 3 years using PR-2 sensors recording soil moisture at different soil depths.
4. Recording of Leaf Area Index: Leaf Area Index will be measured using relevant equipment by IOTSP personnel. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil sampling: Soil samples (depth 0-30 cm) will be taken 1 time per year (winter period) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
6. Leaf samples: Leaf samples will be taken 2 times per year (winter and summer) in control and demonstration plots by FOR agronomists for monitoring purposes and for assisting the issuing of fertilizing schedule.
7. Nitrate leaching: Soil sampling for assessing nitrate leaching at 3 depths (20, 40 and 100 cm) will be performed in control and demonstration plots during the irrigation period and during winter.
8. Recording of irrigation water use: Two water meters will be installed in order to record irrigation water usage (FOR agronomists) in control and demonstration plots after each irrigation event.
9. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

4. ACTION PLANS FOR THE PILOT FARMS OF AGRI SUB-BASIN

4.1 Pilot farm 1 (number code 29)

Farm Description

- Farmer / Manager: Tristano Alessandro
- Crop: Apricot, Orange rubis
- Coordinates: 40.258885 ; 16.666309
- Size: 1.3 ha / 769 trees
- Planting year 2008
- Water management: Drip irrigation system (double line)
- Agrochemicals management: Conventional farm
- Mean yield: 19.23 t/ha
- Annual irrigation applied:
    - 2300 m^3/ha
- Fertilizing:
    - Nitrogen (N): YES
    - Phosphorus (P_2O_5): YES
    - Potassium (K_2O): YES
    - Calcium: YES
- Fertigation: yes
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: YES
    - Weed mowing: YES
    - Cover crops: NO
    - Grazing: NO
    - Pruning: Yes (2 per year)
    - Shredding of prunings: YES
- Plant protection
- Number of applications per year: 6
- Irrigation system characteristics:
    - Length irrigation line: 3845
    - Emitters distance: 2,5
    - n° emitters: 1538
    - Emitters flow rate (L/H): 24
    - Irrigation sector flow rate MC/H: 36,91
    - Flow rate L/sec: 10,25
    - N sectors: 3

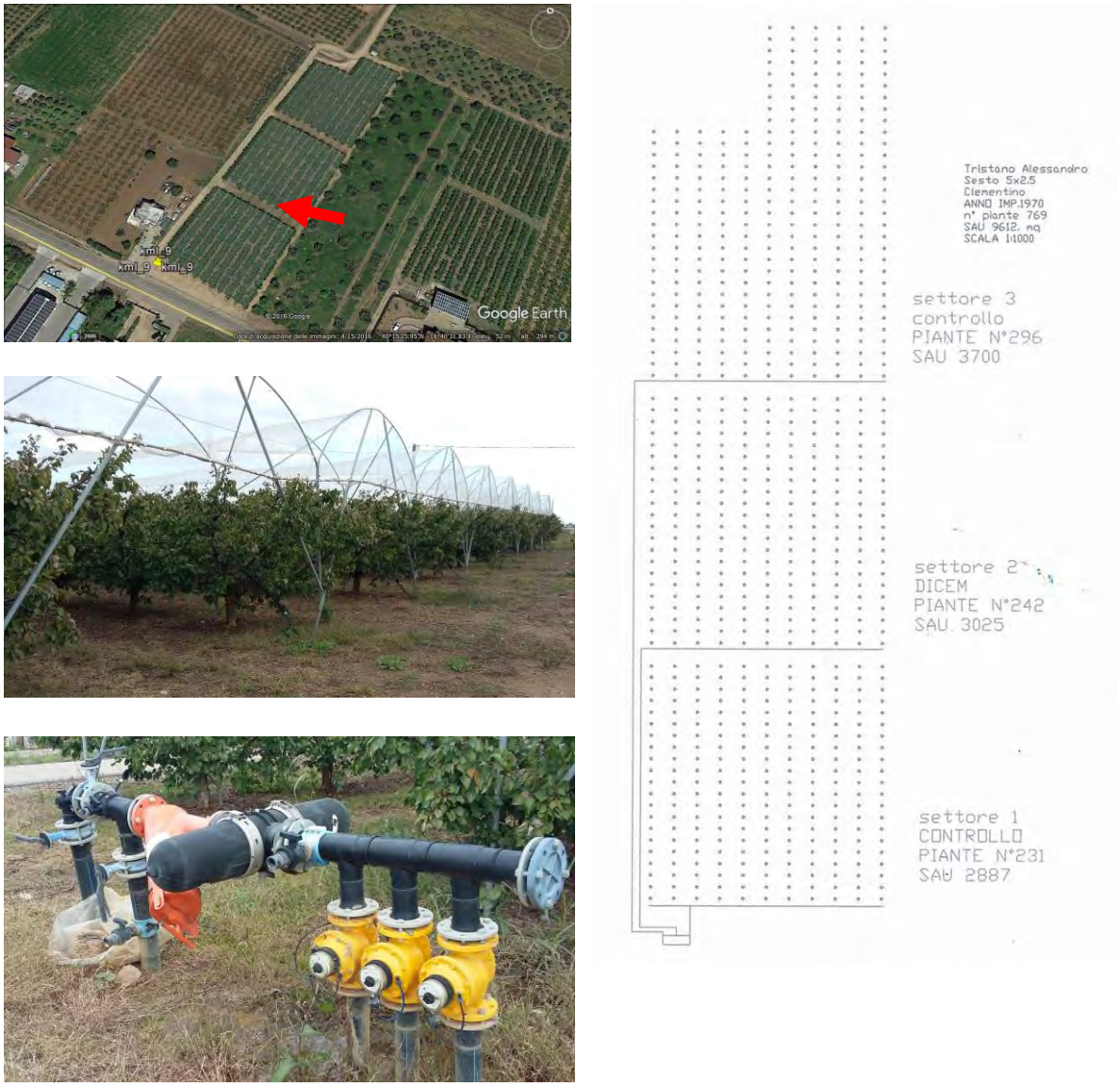


Fig. 24. Location overview, photos and other information for pilot farm 1 in Agri sub-basin.

The pilot site 1 is composed by three sectors (0.30 ha each). An overview of the farm is presented in Fig. 24. Irrigation and nutrition are managed empirically and weed mowing (a wide soil portion of 80 cm on the both sides of the row) in the inter row portion is applied. Some practices related to the reduction of water consumption are already applied as follows:

- Fertigation
- 2 pruning events per year
- shredding of the pruning residues into the field.

The mean volume of irrigation water used per year is 2300 m3/ha and the mean yield of last 5 years is 19.23 t/ha. In addition, 1 event of soil cultivation and 3 mowing interventions per year are performed. Four fertilizations interventions per year were performed from March to May and no organic matter source (manure, compost…) was added to the soil. A register of PPPs and agrochemicals products application is already used.

List of good agricultural practices and interventions

The pilot parcel will be divided into two parts: the demonstration plot (approx. 0,2 hectares), where the proposed agricultural practices will be applied and the control plot where the traditional practices will continue to be exercised allowing for comparisons between the traditional and the proposed ones. The irrigation system will be divided in two parts and in each part water-meters will be installed, in order to precisely control the amount of irrigation water that is applied to the orchard. Only for demonstration part, volumetric valves will be installed, together with a timer, in order to automate shifts and volumes of each single irrigation.

In the demonstration plot the following practices will be applied:

1. No soil tillage
2. Spontaneous cover crops: Mowing of cover crops (in a reduced soil portion of 20 cm, compared to the control, 80 cm) will be applied during the periods of high competition for nutrient, water and light between the main crop and the cover crops.
3. Shredding of prunings: Pruning residues will be shredded into the demonstration plot.
4. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
5. Application of organic material: Organic matters (compost, manure) will be applied 3 times during the project (winter application). In particular, 10 t/ha of compost will be added yearly during winter (dormancy of plant) along the wetted row, without exceeding the max value of 180 U of N set by the Nitrates Directive.
6. Winter pruning: Already applied annually by the farmer and it will continue to be applied in the demonstration plot, but based on the guidelines of UNIBAS.
7. Summer pruning: UNIBAS research group will evaluate each year the need for pruning during pre or post harvest. Pre-harvest pruning improves light penetration and, therefore, standardizes the quality of fruits in different zones of the canopy. Any interventions in post harvest will aim to reduce the transpiration, avoiding the shaded areas in the canopy and then increase the WUE.
8. Irrigation schedule: In order to define the irrigation volumes a daily water balance calibrated on the need of the crop in relation to the climatic conditions will be calculated.
9. Deficit irrigation: During the post harvest period, a regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data, monitoring sensors and the use of crop coefficients (K_C).

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring procedures will be performed in this pilot farm:

1. Irrigation water use: Two water meters will be installed in order to record irrigation water use in control and demonstration plots after each irrigation event.

2. Soil characterization. Chemical-physical and hydrological characteristics of the soil will be studied in order to know the capacity to retain water, define the wilting point (WP) and the field capacity and the optimal threshold for the crop.
3. Soil water content: Monitoring of soil moisture in the demonstration plot will be performed using 2 soil moisture sensors at two soil depths (20, 50 cm).
4. Transpiration water losses: Leaf Area Index will be measured once during summer using relevant equipment (LiCor LAI 2000) by UNIBAS personnel. The water saving obtained with pruning for reducing the transpiring surface of plant will be calculated based on LAI differences between the demonstration and the control plots. This measurement does not require the permanent installation of equipment in the orchard.
5. Soil characterization: Soil samples (depth 0-30 cm) will be taken 1 time at the beginning of the first implementation year (2017) in control and demonstration plots for soil characterization.
6. Nitrate leaching: Soil sampling for assessing nitrate leaching at 2 depths (50, 25 cm) in the soil portion wetted by irrigation will be performed in control and demonstration plots during the growing season at 15 day-intervals.
7. Organic fertilizers analysis: to evaluate macro and microelements quantity one analysis of organic fertilizers will be performed.
8. Assessment of orchard input (fertilizers, chopped pruning material and weeds) and output (plant nutritional request) for nutritional balance.
9. Biomass from weed mowing: quantification of biomass (dry weight) from weed mowing by a representative sub-sample will be calculated.
10. Biomass from pruning: quantification of biomass(dry weight) from pruning residues by a representative sub-sample will be calculated.
11. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

Equipment

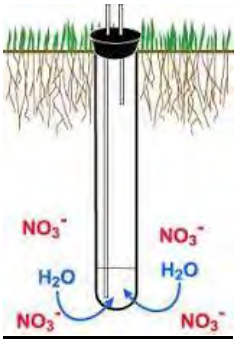
The following monitoring equipment will be used in order to monitor the parameters described above.

Water meter

Timer

WaterScout SM 100 sensor shown with the WatchDog Irrigation Station

Water Scout Sensor



Lysimeter

Nitrachek 404

Nitracheck

Laboratory oven

Field scale

Timer

LiCor, LAI 2000

4.2 Pilot farm 2 (number code 79)

Farm Description

- Farmer / Manager: Valicenti Giuseppe
- Crop: Apricot, mogador
- Coordinates: 40.285893; 16.693747
- Size: 1.5 ha / 854 trees
- Planting year 2015
- Water management: Drip irrigation system (single line)

- Agrochemicals management: Conventional farm
- Mean yield: NA t/ha
- Annual irrigation applied:
    - 2000 m^3/ha
- Fertilizing:
    - Nitrogen (N): YES
    - Phosphorus (P_2O_5): YES
    - Potassium (K_2O): YES
    - Calcium: YES
- Fertigation: yes
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: YES
    - Weed mowing: YES
    - Cover crops: NO
    - Grazing: NO
    - Pruning: Yes (2 per year)
    - Shredding of prunings: YES
- Plant protection
    - Number of applications per year: 5
- Irrigation system characteristics:
    - Length irrigation line: 3416
    - Emitters distance: 0,6
    - n° emitters: 5693
    - Emitters flow rate (L/H): 2,3
    - Irrigation sector flow rate MC/H: 13,09
    - Flow rate L/sec: 3,64
    - N sectors: 1

Fig. 25. Location overview, photos and other information for pilot farm 2 in Agri sub-basin.

The pilot site 2 is composed by two sectors (0.70 ha each). An overview of the farm is presented in Fig. 25. In the pilot site 2 some practices related to the reduction of water consumption are already applied before the LIFE AgroClimaWater implementation, namely fertigation. The mean volume of irrigation water used per year is 5000 m^3/ha. Three fertilizations interventions per year were performed from March to May and no organic matter source (manure, compost…) was added to the soil.

A register of PPPs and agrochemicals products application is already used. No more data are available because the planting year is 2015.

List of good agricultural practices and interventions

The pilot parcel will be divided into two parts: the demonstration plot (approx. 0,2 hectares), where the proposed agricultural practices will be applied and the control plot where the traditional practices will continue to be exercised allowing for comparisons between the traditional and the proposed ones. The irrigation system will be divided in two parts and in each part water-meters will be installed, in order to precisely control the amount of irrigation water that is applied to the orchard. Only for demonstration part, volumetric valves will be installed, together with a timer, in order to automate shifts and volumes of each single irrigation.

In the demonstration plot the following practices will be applied:

1. No soil tillage
2. Spontaneous cover crops: Mowing of cover crops (in a reduced soil portion of 20 cm, compared to the control, 80 cm) will be applied during the periods of high competition for nutrient, water and light between the main crop and the cover crops.
3. Shredding of prunings: Pruning residues will be shredded into the demonstration plot.
4. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
5. Application of organic material: Organic matters (compost, manure) will be applied 3 times during the project (winter application). In particular, 10 t/ha of compost will be added yearly during winter (dormancy of plant) along the wetted row, without exceeding the max value of 180 U of N set by the Nitrates Directive.
6. Winter pruning: Already applied annually by the farmer and it will continue to be applied in the demonstration plot, but based on the guidelines of UNIBAS.
7. Summer pruning: UNIBAS research group will evaluate each year the need for pruning during pre or post harvest. Pre-harvest pruning improves light penetration and, therefore, standardizes the quality of fruits in different zones of the canopy. Any interventions in post harvest will aim to reduce the transpiration, avoiding the shaded areas in the canopy and then increase the WUE.
8. Irrigation schedule: In order to define the irrigation volumes a daily water balance calibrated on the need of the crop in relation to the climatic conditions will be calculated.
9. Deficit irrigation: During the post harvest period, a regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data, monitoring sensors and the use of crop coefficients (K_C).

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring procedures will be performed in this pilot farm:

1. Irrigation water use: Two water meters will be installed in order to record irrigation water use in control and demonstration plots after each irrigation event.
2. Soil water content: Monitoring of soil moisture in the demonstration plot will be performed using 2 soil moisture sensors at two soil depths (20, 50 cm).
3. Transpiration water losses: Leaf Area Index will be measured once during summer using relevant equipment (LiCor, LAI 2000) by UNIBAS personnel. The water saving obtained with pruning for reducing the transpiring surface of plant will be calculated based on LAI differences between the demonstration and the control plots. This measurement does not require the permanent installation of equipment in the orchard.

4. Soil characterization: Soil samples (depth 0-30 cm) will be taken 1 time at the beginning of the first implementation year (2017) in control and demonstration plots for soil characterization.
5. Nitrate leaching: Soil sampling for assessing nitrate leaching at 2 depths (50, 25 cm) in the soil portion wetted by irrigation will be performed in control and demonstration plots during the growing season at 15 day-intervals.
6. Organic fertilizers analysis: to evaluate macro and microelements quantity one analysis of organic fertilizers will be performed.
7. Assessment of orchard input (fertilizers, chopped pruning material and weeds) and output (plant nutritional request) for nutritional balance.
8. Biomass from weed mowing: quantification of biomass (dry weight) from weed mowing by a representative sub-sample will be calculated.
9. Biomass from pruning: quantification of biomass(dry weight) from pruning residues by a representative sub-sample will be calculated.
10. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

Equipment

The following monitoring equipment will be used in order to monitor the parameters described above.

Water meter

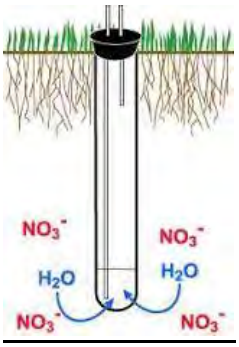
Timer

Water Scout Sensor

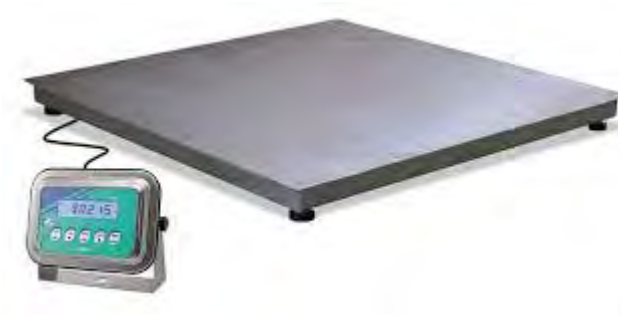
Volumetric valve

Nitrachek 404

Nitracheck



Lysimeter



Field scale

Laboratory oven

Timer

LiCor, LAI 2000

4.3 Pilot farm 3 (number code 63)

Farm Description

- Farmer / Manager: Faillace Franco
- Crop: Orange, New All
- Coordinates: 40.269127; 16.691766
- Size: 1 ha / 491 trees
- Planting year 1990
- Water management: Drip irrigation system
- Agrochemicals management: Conventional farm
- Mean yield: 35 t/ha

- Annual irrigation applied:
    - 3500 m3/ha
- Fertilizing:
    - Nitrogen (N): YES
    - Phosphorus (P2O5): YES
    - Potassium (K2O): YES
    - Calcium: YES
- Fertigation: NO
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: YES
    - Weed mowing: YES
    - Cover crops: yes
    - Grazing: NO
    - Pruning: Yes (2 per year)
    - Shredding of prunings: YES
- Plant protection
    - Number of applications per year: 6
- Irrigation system characteristics
    - Length of irrigation line: 2455
    - Emitters distance: 5
    - n° emitters: 491
    - Emitters flow rate (L/H): 24
    - Irrigation sector flow rate MC/H: 11,78
    - Flow rate L/sec: 3,27
    - N sectors: 1

Currently, an empirical management of irrigation is applied in the pilot site 3 and weed mowing is periodically performed to the soil. An overview of the farm is presented in Fig. 26. In the pilot site 3 some practices related to the reduction of water consumption are already applied before the LIFE AgroClimaWater implementation. In particular, the following BMPs are already applied:

- 2 pruning events per year
- shredding of the pruning residues into the field

The mean volume of irrigation water used per year is 4000 m^3/ha and the mean yield of last 5 years is 30 t/ha. In addition, 1 event of soil cultivation and 3 mowing interventions per year are performed. 3 fertilizations interventions per year were performed from March to July and no organic matter source (manure, compost…) was added to the soil. A register of PPPs and agrochemicals products application is already used.

Fig. 26. Location overview, photos and other information for pilot farm 3 in Agri sub-basin.

List of good agricultural practices and interventions

The pilot parcel will be divided into two parts: the demonstration plot (approx. 0,2 hectares), where the proposed agricultural practices will be applied and the control plot where the traditional practices will continue to be exercised allowing for comparisons between the traditional and the proposed ones. The irrigation system will be divided in two parts and in each part water-meters will be installed, in order to precisely control the amount of irrigation water that is applied to the orchard. Only for demonstration part, volumetric valves will be installed, together with a timer, in order to automate shifts and volumes of each single irrigation.

In the demonstration plot the following practices will be applied:

1. No soil tillage
2. Spontaneous cover crops: Mowing of cover crops (in a reduced soil portion of 20 cm, compared to the control, 80 cm) will be applied during the periods of high competition for nutrient, water and light between the main crop and the cover crops.
3. Shredding of prunings: Pruning residues will be shredded into the demonstration plot.
4. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use

efficiency, as analyzed below. This will be a significant improvement, as compared to present status.

5. Application of organic material: Organic matters (compost, manure) will be applied 3 times during the project (winter application). In particular, 10 t/ha of compost will be added yearly during winter (dormancy of plant) along the wetted row, without exceeding the max value of 180 U of N set by the Nitrates Directive.
6. Winter pruning: Already applied annually by the farmer and it will continue to be applied in the demonstration plot, but based on the guidelines of UNIBAS.
7. Summer pruning: UNIBAS research group will evaluate each year the need for pruning during pre or post harvest. Pre-harvest pruning improves light penetration and, therefore, standardizes the quality of fruits in different zones of the canopy. Any interventions in post harvest will aim to reduce the transpiration, avoiding the shaded areas in the canopy and then increase the WUE.
8. Irrigation schedule: In order to define the irrigation volumes a daily water balance calibrated on the need of the crop in relation to the climatic conditions will be calculated.
9. Deficit irrigation: During the post harvest period, a regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data, monitoring sensors and the use of crop coefficients (K_C).

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring procedures will be performed in this pilot farm:

1. Irrigation water use: Two water meters will be installed in order to record irrigation water use in control and demonstration plots after each irrigation event.
2. Soil water content: Monitoring of soil moisture in the demonstration plot will be performed using 2 soil moisture sensors at two soil depths (30, 60 cm).
3. Transpiration water losses: Leaf Area Index will be measured once during summer using relevant equipment (LiCor LAI 2000) by UNIBAS personnel. The water saving obtained with pruning for reducing the transpiring surface of plant will be calculated based on LAI differences between the demonstration and the control plots. This measurement does not require the permanent installation of equipment in the orchard.
4. Soil characterization: Soil samples (depth 0-30 cm) will be taken 1 time at the beginning of the first implementation year (2017) in control and demonstration plots for soil characterization.
5. Nitrate leaching: Soil sampling for assessing nitrate leaching at 2 depths (60, 30 cm) in the soil portion wetted by irrigation will be performed in control and demonstration plots during the growing season at 15 day-intervals.
6. Organic fertilizers analysis: to evaluate macro and microelements quantity one analysis of organic fertilizers will be performed.
7. Assessment of orchard input (fertilizers, chopped pruning material and weeds) and output (plant nutritional request) for nutritional balance.
8. Biomass from weed mowing: quantification of biomass (dry weight) from weed mowing by a representative sub-sample will be calculated.

9. Biomass from pruning: quantification of biomass(dry weight) from pruning residues by a representative sub-sample will be calculated.
10. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

Equipment

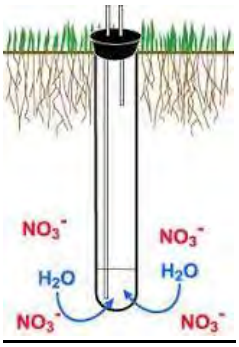
The following monitoring equipment will be used in order to monitor the parameters described above.

Water Scout Sensor

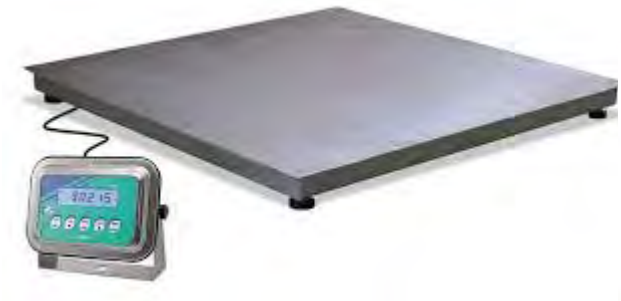
Volumetric valve

Nitrachek 404

Nitracheck



Lysimeter



Field scale

Laboratory oven

Timer

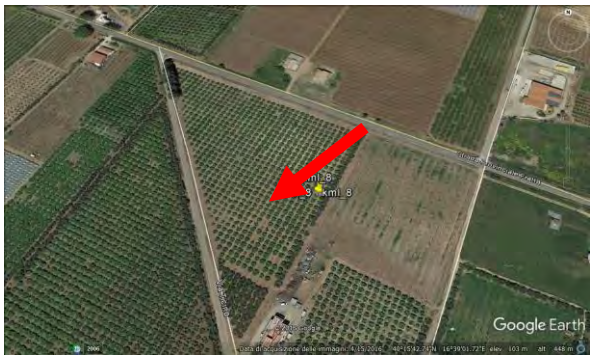
LiCor, LAI 2000

4.4 Pilot farm 4 (number code 44)

Farm Description

- Farmer / Manager: Carrino Salvatore
- Crop: Clementine
- Coordinates: 40.261734; 16.650656
- Size: 2 ha / 806 trees
- Planting year 1980
- Water management: Microjet irrigation system
- Agrochemicals management: Conventional farm
- Mean yield: 25 t/ha
- Annual irrigation applied:
  - 4000 m^3/ha
- Fertilizing:
  - Nitrogen (N): YES
  - Phosphorus (P_2O_5): YES
  - Potassium (K_2O): YES
  - Calcium: YES
- Fertigation: NO
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
  - Soil tillage: YES
  - Weed mowing: YES
  - Cover crops: no
  - Grazing: NO
  - Pruning: Yes (2 per year)
  - Shredding of prunings: YES
- Plant protection
  - Number of applications per year: 6
- Irrigation system characteristics:
  - Length irrigation line: 4030
  - Emitters distance: 5
  - n° emitters: 806
  - Emitters flow rate (L/H): 120
  - Irrigation sector flow rate MC/H : 96,72
  - Flow rate L/sec: 26,87

- N sectors: 2



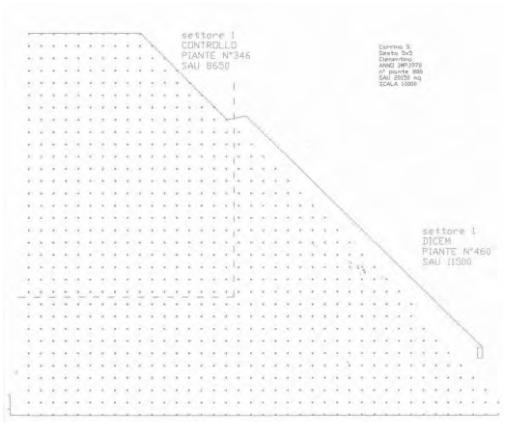


Fig. 27. Location overview, photos and other information for pilot farm 4 in Agri sub-basin

Currently, an empirical management of irrigation is applied in the pilot site 4 and weed mowing is periodically performed to the soil. An overview of the farm is presented in Fig. 27. In the pilot site 4 some practices related to the reduction of water consumption are already applied before the LIFE AgroClimaWater implementation. In particular, the following BMPs are already applied:

- 2 pruning events per year
- shredding of the pruning residues into the field

The mean volume of irrigation water used per year is high, i.e. 4000 m^3/ha and the mean yield of last 5 years is 25 t/ha. In addition, 1 event of soil cultivation and 3 mowing interventions per year are performed. Three fertilizations interventions per year were performed from March to July and no organic matter source (manure,

compost…) was added to the soil. A register of PPPs and agrochemicals products application is already used.

List of good agricultural practices and interventions

The pilot parcel will be divided into two parts: the demonstration plot (approx. 0,2 hectares), where the proposed agricultural practices will be applied and the control plot where the traditional practices will continue to be exercised allowing for comparisons between the traditional and the proposed ones. The irrigation system will be divided in two parts and in each part water-meters will be installed, in order to precisely control the amount of irrigation water that is applied to the orchard. Only for demonstration part, volumetric valves will be installed, together with a timer, in order to automate shifts and volumes of each single irrigation.

In the demonstration plot the following practices will be applied:

1. No soil tillage
2. Spontaneous cover crops: Mowing of cover crops (in a reduced soil portion of 20 cm, compared to the control, 80 cm) will be applied during the periods of high competition for nutrient, water and light between the main crop and the cover crops.
3. Shredding of prunings: Pruning residues will be shredded into the demonstration plot.
4. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
5. Application of organic material: Organic matters (compost, manure) will be applied 3 times during the project (winter application). In particular, 10 t/ha of compost will be added yearly during winter (dormancy of plant) along the wetted row, without exceeding the max value of 180 U of N set by the Nitrates Directive.
6. Winter pruning: Already applied annually by the farmer and it will continue to be applied in the demonstration plot, but based on the guidelines of UNIBAS.
7. Summer pruning: UNIBAS research group will evaluate each year the need for pruning during pre or post harvest. Pre-harvest pruning improves light penetration and, therefore, standardizes the quality of fruits in different zones of the canopy. Any interventions in post harvest will aim to reduce the transpiration, avoiding the shaded areas in the canopy and then increase the WUE.
8. Irrigation schedule: In order to define the irrigation volumes a daily water balance calibrated on the need of the crop in relation to the climatic conditions will be calculated.
9. Deficit irrigation: During the post harvest period, a regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data, monitoring sensors and the use of crop coefficients (K_C).

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring procedures will be performed in this pilot farm:

1. Irrigation water use: Two water meters will be installed in order to record irrigation water use in control and demonstration plots after each irrigation event.
2. Soil water content: Monitoring of soil moisture in the demonstration plot will be performed using 2 soil moisture sensors at two soil depths (30, 60 cm).
3. Transpiration water losses: Leaf Area Index will be measured once during summer using relevant equipment (LiCor LAI 2000) by UNIBAS personnel. The water saving obtained with pruning for reducing the transpiring surface of plant will be calculated based on LAI differences between the demonstration and the control plots. This measurement does not require the permanent installation of equipment in the orchard.
4. Soil characterization: Soil samples (depth 0-30 cm) will be taken 1 time at the beginning of the first implementation year (2017) in control and demonstration plots for soil characterization.
5. Nitrate leaching: Soil sampling for assessing nitrate leaching at 2 depths (60, 30 cm) in the soil portion wetted by irrigation will be performed in control and demonstration plots during the growing season at 15 day-intervals.
6. Organic fertilizers analysis: to evaluate macro and microelements quantity one analysis of organic fertilizers will be performed.
7. Assessment of orchard input (fertilizers, chopped pruning material and weeds) and output (plant nutritional request) for nutritional balance.
8. Biomass from weed mowing: quantification of biomass (dry weight) from weed mowing by a representative sub-sample will be calculated.
9. Biomass from pruning: quantification of biomass(dry weight) from pruning residues by a representative sub-sample will be calculated.
10. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

Equipment

The following monitoring equipment will be used in order to monitor the parameters described above.

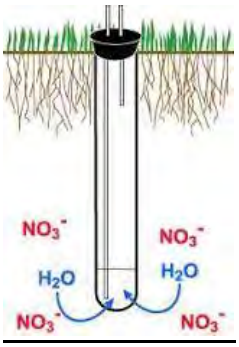
Water meter

Water Scout Sensor

Volumetric valve

Nitrachek 404

Nitracheck



Lysimeter

Field scale

Laboratory oven

Timer

LiCor, LAI 2000

4.5 Pilot farm 5 (number code 110)

Farm Description

- Farmer / Manager: Defilippis Valeria
- Crop: Peach, Sagittaria
- Coordinates: 40.258885 ; 16.666309
- Size: 0.8 ha / 533 trees
- Planting year 2010
- Water management: Drip irrigation system (double line)
- Agrochemicals management: Conventional farm
- Mean yield: 18.75 t/ha
- Annual irrigation applied:
    - 6100 m^3/ha
- Fertilizing:
    - Nitrogen (N): YES
    - Phosphorus (P_2O_5): YES
    - Potassium (K_2O): YES
    - Calcium: YES
- Fertigation: NO
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: YES
    - Weed mowing: YES
    - Cover crops: yes
    - Grazing: NO
    - Pruning: Yes (2 per year)
    - Shredding of prunings: YES
- Plant protection
    - Number of applications per year: 6
- Irrigation system characteristics:
    - Length irrigation line: 2150
    - Emitters distance: 0,6
    - n° emitters: 3583
    - Emitters flow rate (L/H): 2
    - Irrigation sector flow rate MC/H: 7,17

- Flow rate L/sec: 1,99
- N sectors: 2

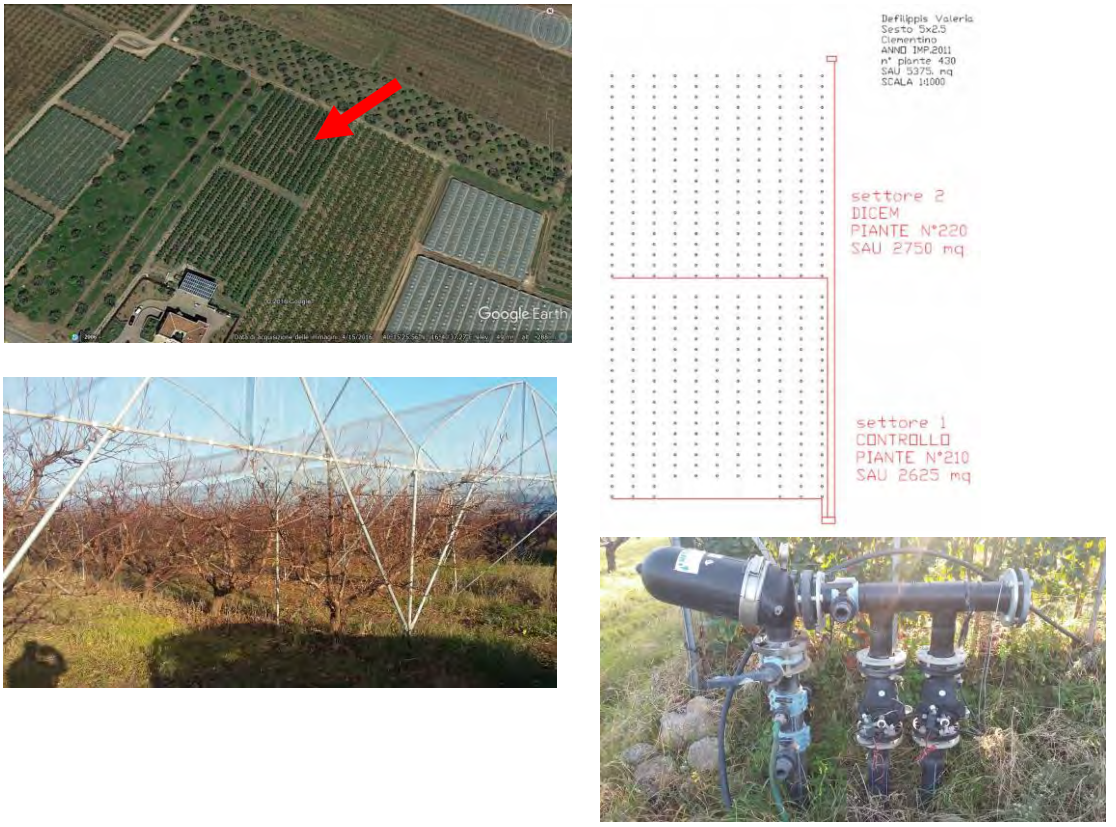


Fig. 28. Location overview, photos and other information for pilot farm 5 in Agri sub-basin.

In the pilot site 5 some practices related to the reduction of water consumption are already applied before the LIFE AgroClimaWater implementation. An overview of the farm is presented in Fig. 28. In particular, the following BMPs are already applied:

- Fertigation
- 2 pruning events per year
- shredding of the pruning residues into the field

The mean volume of irrigation water used per year is high, i.e. 6000 m^3/ha and the mean yield of last 5 years is 20 t/ha. In addition, 1 event of soil cultivation and 3 mowing interventions per year are performed. Three fertilizations interventions per year were performed from March to May and no organic matter source (manure, compost…) was added to the soil. A register of PPPs and agrochemicals products application is already used.

List of good agricultural practices and interventions

The pilot parcel will be divided into two parts: the demonstration plot (approx. 0,2 hectares), where the proposed agricultural practices will be applied and the control plot where the traditional practices will continue to be exercised allowing for comparisons between the traditional and the proposed ones. The irrigation system will be divided in two parts and in each part water-meters will be installed, in order to precisely control the amount of irrigation water that is applied to the orchard. Only for

demonstration part, volumetric valves will be installed, together with a timer, in order to automate shifts and volumes of each single irrigation.

In the demonstration plot the following practices will be applied:

1. No soil tillage
2. Spontaneous cover crops: Mowing of cover crops (in a reduced soil portion of 20 cm, compared to the control, 80 cm) will be applied during the periods of high competition for nutrient, water and light between the main crop and the cover crops.
3. Shredding of prunings: Pruning residues will be shredded into the demonstration plot.
4. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
5. Application of organic material: Organic matters (compost, manure) will be applied 3 times during the project (winter application). In particular, 10 t/ha of compost will be added yearly during winter (dormancy of plant) along the wetted row, without exceeding the max value of 180 U of N set by the Nitrates Directive.
6. Winter pruning: Already applied annually by the farmer and it will continue to be applied in the demonstration plot, but based on the guidelines of UNIBAS.
7. Summer pruning: UNIBAS research group will evaluate each year the need for pruning during pre or post harvest. Pre-harvest pruning improves light penetration and, therefore, standardizes the quality of fruits in different zones of the canopy. Any interventions in post harvest will aim to reduce the transpiration, avoiding the shaded areas in the canopy and then increase the WUE.
8. Irrigation schedule: In order to define the irrigation volumes a daily water balance calibrated on the need of the crop in relation to the climatic conditions will be calculated.
9. Deficit irrigation: During the post harvest period, a regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data, monitoring sensors and the use of crop coefficients (K_C).

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring procedures will be performed in this pilot farm:

1. Irrigation water use: Two water meters will be installed in order to record irrigation water use in control and demonstration plots after each irrigation event.
2. Soil water content: Monitoring of soil moisture in the demonstration plot will be performed using 2 soil moisture sensors at two soil depths (20, 50 cm).
3. Transpiration water losses: Leaf Area Index will be measured once during summer using relevant equipment (LiCor LAI 2000) by UNIBAS personnel. The water saving obtained with pruning for reducing the transpiring surface of plant will be calculated based on LAI differences between the demonstration and the

control plots. This measurement does not require the permanent installation of equipment in the orchard.

4. Soil characterization: Soil samples (depth 0-30 cm) will be taken 1 time at the beginning of the first implementation year (2017) in control and demonstration plots for soil characterization.
5. Nitrate leaching: Soil sampling for assessing nitrate leaching at 2 depths (50, 25 cm) in the soil portion wetted by irrigation will be performed in control and demonstration plots during the growing season at 15 day-intervals.
6. Organic fertilizers analysis: to evaluate macro and microelements quantity one analysis of organic fertilizers will be performed.
7. Assessment of orchard input (fertilizers, chopped pruning material and weeds) and output (plant nutritional request) for nutritional balance.
8. Biomass from weed mowing: quantification of biomass (dry weight) from weed mowing by a representative sub-sample will be calculated.
9. Biomass from pruning: quantification of biomass(dry weight) from pruning residues by a representative sub-sample will be calculated.
10. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

Equipment

The following monitoring equipment will be used in order to monitor the parameters described above.

Water meter

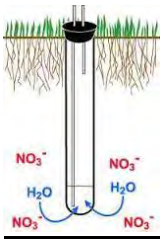
Timer

Water Scout Sensor

Volumetric valve

Nitrachek 404

Nitracheck



Lysimeter

Field scale

Laboratory oven

Timer

LiCor, LAI 2000

4.6 Pilot farm 6 (number code 84)

Farm Description

- Farmer / Manager: SURIANO FRUTTA soc.
- Crop: Peach, Zincal3
- Coordinates: 40.247487; 16.672336
- Size: 2 ha / 1120 trees
- Planting year 2013
- Water management: Drip irrigation system (double line)
- Agrochemicals management: Conventional farm
- Mean yield: 5 t/ha
- Annual irrigation applied:
    - 3250 m^3/ha
- Fertilizing:
    - Nitrogen (N): YES
    - Phosphorus (P_2O_5): YES

  - Potassium (K_2O): YES
  - Calcium: YES
- Fertigation: yes
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
  - Soil tillage: YES
  - Weed mowing: YES
  - Cover crops: no
  - Grazing: NO
  - Pruning: Yes (2 per year)
  - Shredding of prunings: YES
- Plant protection: Number of applications per year: 8
- Irrigation system characteristics:
  - Length irrigation line: 6720
  - Emitters distance: 0,6
  - n° emitters: 11200
  - Emitters flow rate (L/H): 2
  - Irrigation sector flow rate MC/H : 22,40
  - Flow rate L/sec: 6,22
  - N sectors: 1

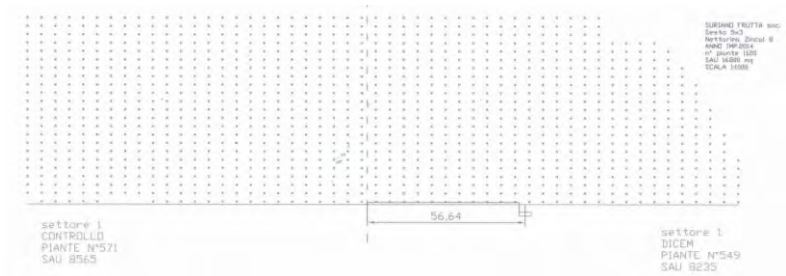


Fig. 29. Location overview, photos and other information for pilot farm 6 in Agri sub-basin.

In the pilot site 6 some practices related to the reduction of water consumption are already applied before the LIFE AgroClimaWater implementation. An overview of the farm is presented in Fig. 29. In particular, the following BMPs are already applied:

- Fertigation
- 2 pruning events per year
- shredding of the pruning residues into the field

The mean volume of irrigation water used per year is high, i.e. 3250 m^3/ha and the mean yield of last 3 years is 5 t/ha because of the planting year is 2013. In addition, 1 event of soil cultivation and 3 mowing interventions per year are performed. 3 fertilizations interventions per year were The pilot parcel will be divided into two parts: the demonstration plot (approx. 0,2 hectares), where the proposed agricultural practices will be applied and the control plot where the traditional practices will continue to be exercised allowing for comparisons between the traditional and the proposed ones. The irrigation system will be divided in two parts and in each part water-meters will be installed, in order to precisely control the amount of irrigation water that is applied to the orchard. Only for demonstration part, volumetric valves will be installed, together with a timer, in order to automate shifts and volumes of each single irrigation.

List of good agricultural practices and interventions

In the demonstration plot the following practices will be applied:

1. No soil tillage
2. Spontaneous cover crops: Mowing of cover crops (in a reduced soil portion of 20 cm, compared to the control, 80 cm) will be applied during the periods of high competition for nutrient, water and light between the main crop and the cover crops.
3. Shredding of prunings: Pruning residues will be shredded into the demonstration plot.
4. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
5. Application of organic material: Organic matters (compost, manure) will be applied 3 times during the project (winter application). In particular, 10 t/ha of compost will be added yearly during winter (dormancy of plant) along the wetted row, without exceeding the max value of 180 U of N set by the Nitrates Directive.
6. Winter pruning: Already applied annually by the farmer and it will continue to be applied in the demonstration plot, but based on the guidelines of UNIBAS.
7. Summer pruning: UNIBAS research group will evaluate each year the need for pruning during pre or post harvest. Pre-harvest pruning improves light penetration and, therefore, standardizes the quality of fruits in different zones of the canopy. Any interventions in post harvest will aim to reduce the transpiration, avoiding the shaded areas in the canopy and then increase the WUE.
8. Irrigation schedule: In order to define the irrigation volumes a daily water balance calibrated on the need of the crop in relation to the climatic conditions will be calculated.

9. Deficit irrigation: During the post harvest period, a regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data, monitoring sensors and the use of crop coefficients (K_C).

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring procedures will be performed in this pilot farm:

1. Irrigation water use: Two water meters will be installed in order to record irrigation water use in control and demonstration plots after each irrigation event.
2. Soil water content: Monitoring of soil moisture in the demonstration plot will be performed using 2 soil moisture sensors at two soil depths (20, 50 cm).
3. Transpiration water losses: Leaf Area Index will be measured once during summer using relevant equipment (LiCor LAI 2000) by UNIBAS personnel. The water saving obtained with pruning for reducing the transpiring surface of plant will be calculated based on LAI differences between the demonstration and the control plots. This measurement does not require the permanent installation of equipment in the orchard.
4. Soil characterization: Soil samples (depth 0-30 cm) will be taken 1 time at the beginning of the first implementation year (2017) in control and demonstration plots for soil characterization.
5. Nitrate leaching: Soil sampling for assessing nitrate leaching at 2 depths (50, 25 cm) in the soil portion wetted by irrigation will be performed in control and demonstration plots during the growing season at 15 day-intervals.
6. Organic fertilizers analysis: to evaluate macro and microelements quantity one analysis of organic fertilizers will be performed.
7. Assessment of orchard input (fertilizers, chopped pruning material and weeds) and output (plant nutritional request) for nutritional balance.
8. Biomass from weed mowing: quantification of biomass (dry weight) from weed mowing by a representative sub-sample will be calculated.
9. Biomass from pruning: quantification of biomass(dry weight) from pruning residues by a representative sub-sample will be calculated.
10. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

Equipment

The following monitoring equipment will be used in order to monitor the parameters described above.

Water meter

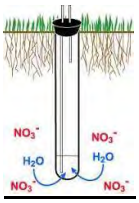
Timer

Water Scout Sensor

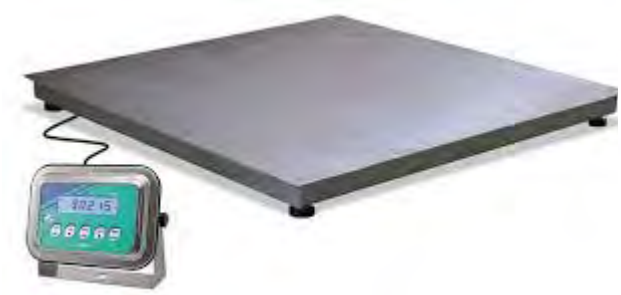
Volumetric valve

Nitrachek 404

Nitracheck



Lysimeter



Field scale

Laboratory oven

LiCor, LAI 2000

Timer

4.7 Pilot farm 7 (number code 85)

Farm Description

- Farmer / Manager: SURIANO FRUTTA soc.
- Crop: Peach, Zincal8
- Coordinates: 40.262793;16.655957
- Size: 2 ha / 1218 trees
- Planting year 2013
- Water management: Drip irrigation system (double line)
- Agrochemicals management: Conventional farm
- Mean yield: 5 t/ha
- Annual irrigation applied:
    - 3250 m^3/ha
- Fertilizing:
    - Nitrogen (N): YES
    - Phosphorus (P_2O_5): YES
    - Potassium (K_2O): YES
    - Calcium: YES
- Fertigation: yes
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: YES
    - Weed mowing: YES
    - Cover crops: no
    - Grazing: NO
    - Pruning: Yes (2 per year)
    - Shredding of prunings: YES
- Plant protection: Number of applications per year: 8
- Irrigation system characteristics:
    - Length irrigation line: 7308
    - Emitters distance: 0,6
    - n° emitters: 12180
    - Emitters flow rate (L/H): 2
    - Irrigation sector flow rate MC/H : 24,36
    - Flow rate L/sec: 6,77
    - N sectors: 1

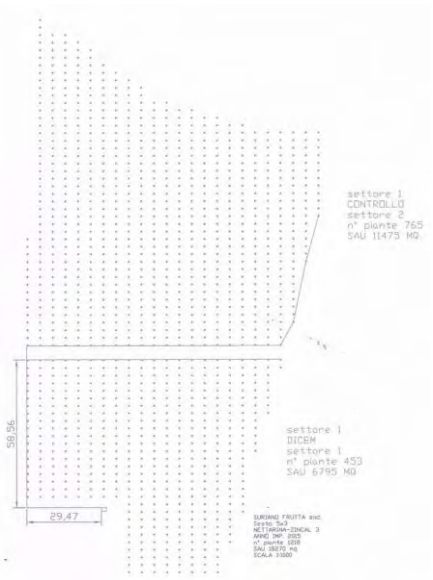


Fig. 30. Location overview, photos and other information for pilot farm 7 in Agri sub-basin.

In the pilot site 7 some practices related to the reduction of water consumption are already applied before the LIFE AgroClimaWater implementation. An overview of the farm is presented in Fig. 30. In particular, the following BMPs are already applied:

- Fertigation
- 2 pruning events per year
- shredding of the pruning residues into the field

The mean volume of irrigation water used per year is 3250 m^3/ha and the mean yield of last 3 years is 5 t/ha because of the planting year is 2013. In addition, 1 event of soil cultivation and 3 mowing interventions per year are performed. 3 fertilizations interventions per year were performed from March to May and no organic matter source (manure, compost…) was added to the soil. A register of PPPs and agrochemicals products application is already used.

List of good agricultural practices and interventions

The pilot parcel will be divided into two parts: the demonstration plot (approx. 0,2 hectares), where the proposed agricultural practices will be applied and the control

plot where the traditional practices will continue to be exercised allowing for comparisons between the traditional and the proposed ones. The irrigation system will be divided in two parts and in each part water-meters will be installed, in order to precisely control the amount of irrigation water that is applied to the orchard. Only for demonstration part, volumetric valves will be installed, together with a timer, in order to automate shifts and volumes of each single irrigation.
In the demonstration plot the following practices will be applied:

1. No soil tillage
2. Spontaneous cover crops: Mowing of cover crops (in a reduced soil portion of 20 cm, compared to the control, 80 cm) will be applied during the periods of high competition for nutrient, water and light between the main crop and the cover crops.
3. Shredding of prunings: Pruning residues will be shredded into the demonstration plot.
4. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
5. Application of organic material: Organic matters (compost, manure) will be applied 3 times during the project (winter application). In particular, 10 t/ha of compost will be added yearly during winter (dormancy of plant) along the wetted row, without exceeding the max value of 180 U of N set by the Nitrates Directive.
6. Winter pruning: Already applied annually by the farmer and it will continue to be applied in the demonstration plot, but based on the guidelines of UNIBAS.
7. Summer pruning: UNIBAS research group will evaluate each year the need for pruning during pre or post harvest. Pre-harvest pruning improves light penetration and, therefore, standardizes the quality of fruits in different zones of the canopy. Any interventions in post harvest will aim to reduce the transpiration, avoiding the shaded areas in the canopy and then increase the WUE.
8. Irrigation schedule: In order to define the irrigation volumes a daily water balance calibrated on the need of the crop in relation to the climatic conditions will be calculated.
9. Deficit irrigation: During the post harvest period, a regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data, monitoring sensors and the use of crop coefficients (K_C).

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring procedures will be performed in this pilot farm:

1. Irrigation water use: Two water meters will be installed in order to record irrigation water use in control and demonstration plots after each irrigation event.
2. Soil water content: Monitoring of soil moisture in the demonstration plot will be performed using 2 soil moisture sensors at two soil depths (20, 50 cm).

3. Transpiration water losses: Leaf Area Index will be measured once during summer using relevant equipment (LiCor LAI 2000) by UNIBAS personnel. The water saving obtained with pruning for reducing the transpiring surface of plant will be calculated based on LAI differences between the demonstration and the control plots. This measurement does not require the permanent installation of equipment in the orchard.
4. Soil characterization: Soil samples (depth 0-30 cm) will be taken 1 time at the beginning of the first implementation year (2017) in control and demonstration plots for soil characterization.
5. Nitrate leaching: Soil sampling for assessing nitrate leaching at 2 depths (50, 25 cm) in the soil portion wetted by irrigation will be performed in control and demonstration plots during the growing season at 15 day-intervals.
6. Biomass from weed mowing: quantification of biomass from weed mowing by a representative sub-sample will be calculated.
7. Biomass from pruning: quantification of biomass from pruning residues by a representative sub-sample will be calculated.
8. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

Equipment

The following monitoring equipment will be used in order to monitor the parameters described above.

Water meter

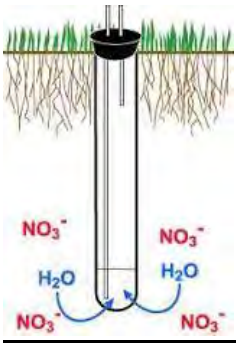
Timer

Water Scout Sensor

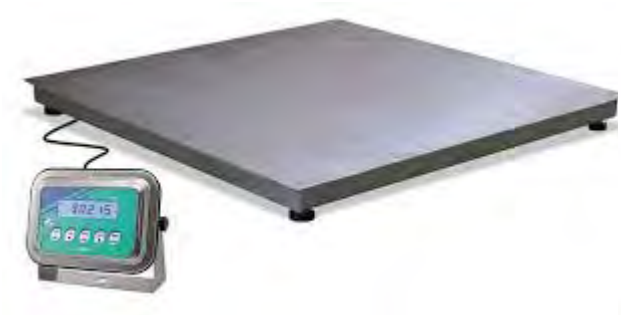
Volumetric valve

Nitrachek 404

Nitracheck



Lysimeter



Field scale

Laboratory oven

Timer

LiCor, LAI 2000

4.8 Pilot farm 8 (number code 107)

Farm Description

- Farmer / Manager: Bonfiglio Donato
- Crop: Olive, Ogliarola
- Coordinates: 40.31687, 16.56385
- Size: 1 ha / 171 trees
- Planting year 1950
- Water management: Drip irrigation system
- Agrochemicals management: Organic farm
- Mean yield: 4 t/ha
- Annual irrigation applied:
    - 2500 m^3/ha

- Fertilizing:
  - Nitrogen (N): yes
  - Phosphorus (P_2O_5): yes
  - Potassium (K_2O): yes
  - Calcium: YES
- Fertigation: no
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
  - Soil tillage: YES
  - Weed mowing: no
  - Cover crops: yes
  - Grazing: NO
  - Pruning: Yes (1 per year)
  - Shredding of prunings: no
- Plant protection yes: Number of applications per year: 2

Fig. 31. Location overview, photos and other information for pilot farm 8 in Agri sub-basin.

Currently, an empirical management of irrigation is applied in the pilot site 8 and weed mowing is periodically performed to the soil. An overview of the farm is presented in Fig. 31. The pilot site 8 is managed according to the organic farming. Some practices related to the reduction of water consumption are already applied before the LIFE AgroClimaWater implementation. In particular, the following BMPs are already applied:

- 1 pruning event per year
- shredding of a part of the pruning residues into the field; the remaining part is used for heating.

The mean volume of irrigation water used per year is 2500 m^3/ha and the mean yield of last 5 years is 4 t/ha. In addition, 3 events of soil cultivation per year are performed.
1 fertilizations intervention per year was performed and no organic matter source (manure, compost…) was added to the soil. A register of PPPs and agrochemicals products application is already used.

List of good agricultural practices and interventions
The pilot parcel will be divided into two parts: the demonstration plot (approx. 0,2 hectares), where the proposed agricultural practices will be applied and the control plot where the traditional practices will continue to be exercised allowing for comparisons between the traditional and the proposed ones. The irrigation system will be divided in two parts and in each part water-meters will be installed, in order to precisely control the amount of irrigation water that is applied to the orchard. Only for demonstration part, volumetric valves will be installed, together with a timer, in order to automate shifts and volumes of each single irrigation.
In the demonstration plot the following practices will be applied:

1. No soil tillage
2. Spontaneous cover crops: Mowing of cover crops (in a reduced soil portion of 20 cm, compared to the control, 80 cm) will be applied during the periods of high competition for nutrient, water and light between the main crop and the cover crops.
3. Shredding of prunings: Pruning residues will be shredded into the demonstration plot.
4. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
5. Application of organic material: Organic matters (compost, manure) will be applied 3 times during the project (winter application). In particular, 10 t/ha of compost will be added yearly during winter (dormancy of plant) along the wetted row, without exceeding the max value of 180 U of N set by the Nitrates Directive.
6. Irrigation schedule: In order to define the irrigation volumes a daily water balance calibrated on the need of the crop in relation to the climatic conditions will be calculated.
7. Deficit irrigation: During the post harvest period, a regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data, monitoring sensors and the use of crop coefficients (K_C).
8. Pruning: UNIBAS research group will evaluate each year the need for pruning, in order to improve light penetration and, therefore, standardizes the quality of fruits in different zones of the canopy and remove tree suckers and watersprouts.

Monitoring
Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring procedures will be performed in this pilot farm:

1. Irrigation water use: Two water meters will be installed in order to record irrigation water use in control and demonstration plots after each irrigation event.
2. Soil water content: Monitoring of soil moisture in the demonstration plot will be performed using 2 soil moisture sensors at two soil depths (30, 60 cm).
3. Transpiration water losses: Leaf Area Index will be measured once during summer using relevant equipment (LiCor LAI 2000) by UNIBAS personnel. The water saving obtained with pruning for reducing the transpiring surface of plant will be calculated based on LAI differences between the demonstration and the control plots. This measurement does not require the permanent installation of equipment in the orchard.
4. Soil characterization: Soil samples (depth 0-30 cm) will be taken 1 time at the beginning of the first implementation year (2017) in control and demonstration plots for soil characterization.
5. Nitrate leaching: Soil sampling for assessing nitrate leaching at 2 depths (50, 25 cm) in the soil portion wetted by irrigation will be performed in control and demonstration plots during the growing season at 15 day-intervals.
6. Organic fertilizers analysis: to evaluate macro and microelements quantity one analysis of organic fertilizers will be performed.
7. Assessment of orchard input (fertilizers, chopped pruning material and weeds) and output (plant nutritional request) for nutritional balance.
8. Biomass from weed mowing: quantification of biomass (dry weight) from weed mowing by a representative sub-sample will be calculated.
9. Biomass from pruning: quantification of biomass(dry weight) from pruning residues by a representative sub-sample will be calculated.
10. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

Equipment

The following monitoring equipment will be used in order to monitor the parameters described above.

Water meter

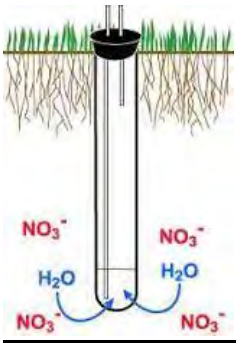
Timer

Water Scout Sensor

Volumetric valve

Nitrachek 404

Nitracheck



Lysimeter

Field scale

Laboratory oven

Timer

LiCor, LAI 2000

4.9 Pilot farm 9 (number code 101)

Farm Description

- Farmer / Manager: Tuzio Angelo
- Crop: Olive, Ogliarola
- Coordinates: 40.27258, 16.52373
- Size: 2.2 ha / 344 trees
- Planting year 1940
- Water management: Drip irrigation system
- Agrochemicals management: Conventional farm
- Mean yield: 2.5 t/ha
- Annual irrigation applied:
    - 3000 m^3/ha
- Fertilizing:
    - Nitrogen (N): YES
    - Phosphorus (P_2O_5): YES
    - Potassium (K_2O): YES
    - Calcium: YES
- Fertigation: no
- Foliar application of nutrients: NO
- Organic material applied: NO
- Orchard Management:
    - Soil tillage: YES
    - Weed mowing: no
    - Cover crops: yes
    - Grazing: NO
    - Pruning: Yes (1 per year)
    - Shredding of prunings: no
- Plant protection: yes
    - Number of applications per year: 4

Fig. 32. Location overview, photos and other information for pilot farm 9 in Agri sub-basin.

In the pilot site 9 some practices related to the reduction of water consumption are already applied before the LIFE AgroClimaWater implementation. An overview of the farm is presented in Fig. 32. In particular, the following BMPs are already applied:

- 1 pruning event per year
- shredding of a part of the pruning residues into the field; the remaining part is used for heating.
- Soil is covered by spontaneous cover crops.

The mean volume of irrigation water used per year is 3000 m^3/ha and the mean yield of last 5 years is 6 t/ha. In addition, 3 events of weed mowing and 1 fertilizations intervention per year are performed. No organic matter source (manure, compost…) is added to the soil. A register of PPPs application is already used, while no herbicides are applied.

List of good agricultural practices and interventions

The pilot parcel will be divided into two parts: the demonstration plot (approx. 0,2 hectares), where the proposed agricultural practices will be applied and the control plot where the traditional practices will continue to be exercised allowing for comparisons between the traditional and the proposed ones. The irrigation system will be divided in two parts and in each part water-meters will be installed, in order to precisely control the amount of irrigation water that is applied to the orchard. Only for demonstration part, volumetric valves will be installed, together with a timer, in order to automate shifts and volumes of each single irrigation.

In the demonstration plot the following practices will be applied:

1. No soil tillage
2. Spontaneous cover crops: Mowing of cover crops (in a reduced soil portion of 20 cm, compared to the control, 80 cm) will be applied during the periods of high competition for nutrient, water and light between the main crop and the cover crops.
3. Shredding of prunings: Pruning residues will be shredded into the demonstration plot.

4. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
5. Application of organic material: Organic matters (compost, manure) will be applied 3 times during the project (winter application). In particular, 10 t/ha of compost will be added yearly during winter (dormancy of plant) along the wetted row, without exceeding the max value of 180 U of N set by the Nitrates Directive.
6. Irrigation schedule: In order to define the irrigation volumes a daily water balance calibrated on the need of the crop in relation to the climatic conditions will be calculated.
7. Deficit irrigation: During the post harvest period, a regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data, monitoring sensors and the use of crop coefficients (K_C).
8. Pruning: UNIBAS research group will evaluate each year the need for pruning, in order to improve light penetration and, therefore, standardizes the quality of fruits in different zones of the canopy and remove tree suckers and watersprouts.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring procedures will be performed in this pilot farm:

1. Irrigation water use: Two water meters will be installed in order to record irrigation water use in control and demonstration plots after each irrigation event.
2. Soil water content: Monitoring of soil moisture in the demonstration plot will be performed using 2 soil moisture sensors at two soil depths (30, 60 cm).
3. Transpiration water losses: Leaf Area Index will be measured once during summer using relevant equipment (LiCor LAI 2000) by UNIBAS personnel. The water saving obtained with pruning for reducing the transpiring surface of plant will be calculated based on LAI differences between the demonstration and the control plots. This measurement does not require the permanent installation of equipment in the orchard.
4. Soil characterization: Soil samples (depth 0-30 cm) will be taken 1 time at the beginning of the first implementation year (2017) in control and demonstration plots for soil characterization.
5. Nitrate leaching: Soil sampling for assessing nitrate leaching at 2 depths (50, 25 cm) in the soil portion wetted by irrigation will be performed in control and demonstration plots during the growing season at 15 day-intervals.
6. Organic fertilizers analysis: to evaluate macro and microelements quantity one analysis of organic fertilizers will be performed.
7. Assessment of orchard input (fertilizers, chopped pruning material and weeds) and output (plant nutritional request) for nutritional balance.
8. Biomass from weed mowing: quantification of biomass (dry weight) from weed mowing by a representative sub-sample will be calculated.

9. Biomass from pruning: quantification of biomass(dry weight) from pruning residues by a representative sub-sample will be calculated.
10. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

Equipment

The following monitoring equipment will be used in order to monitor the parameters described above.

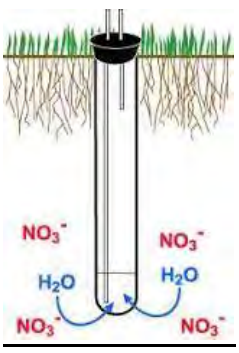
Water meter

Timer

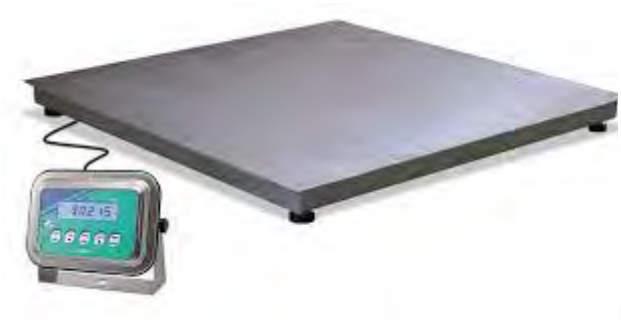
Water Scout Sensor

Volumetric valve

Nitracheck



Lysimeter



Field scale

Laboratory oven

Timer

LiCor, LAI 2000

4.10 Pilot farm 10 (number code 97)

Farm Description

- Farmer / Manager: Fortunato Leonardo
- Crop: Olive, Ogliarola
- Coordinates: 40.29799, 16.46554
- Size: 3 ha / 188 trees
- Planting year 1900
- Water management: rainfed
- Agrochemicals management: organic farm
- Mean yield: 1.9 t/ha
- Annual irrigation applied: no
- Fertilizing:
    - Nitrogen (N):
    - Phosphorus (P_2O_5): NO
    - Potassium (K_2O):
    - Calcium: NO
- Fertigation: no
- Foliar application of nutrients: NO
- Organic material applied: yes, manure (30 kg/year)
- Orchard Management:
    - Soil tillage: YES
    - Weed mowing: no

- Cover crops: yes
- Grazing: NO
- Pruning: Yes (0.5 per year)
- Shredding of prunings: no

- Plant protection: yes
  - Number of applications per year: 2

Fig. 33. Location overview of pilot farm 10 in Agri sub-basin.

The pilot site 10 is managed according to the organic farming and under rainfed conditions. An overview of the farm is presented in Fig. 33. Some practices related to the reduction of water consumption are already applied before the LIFE AgroClimaWater implementation. In particular, the following BMPs are already applied:

- 1 pruning event per year
- shredding of a part of the pruning residues into the field; the remaining part is used for heating.
- Soil is covered by spontaneous cover crops.

The mean yield of last 5 years is less than 2 t/ha. In addition, 2 soil cultivation interventions per year are performed. One organic matter application of manure (30 Kg) per year is added to the soil. Only one PPPs application per year is performed, while no herbicides are applied.

List of good agricultural practices and interventions

The pilot parcel will be divided into two parts: the demonstration plot (approx. 0,2 hectares), where the proposed agricultural practices will be applied and the control plot where the traditional practices will continue to be exercised allowing for comparisons between the traditional and the proposed ones. The irrigation system will be divided in two parts and in each part water-meters will be installed, in order to precisely control the amount of irrigation water that is applied to the orchard. Only for demonstration part, volumetric valves will be installed, together with a timer, in order to automate shifts and volumes of each single irrigation.

In the demonstration plot the following practices will be applied:

1. No soil tillage

2. Spontaneous cover crops: Mowing of cover crops (in a reduced soil portion of 20 cm, compared to the control, 80 cm) will be applied during the periods of high competition for nutrient, water and light between the main crop and the cover crops.
3. Shredding of prunings: Pruning residues will be shredded into the demonstration plot.
4. Fertilizing based upon leaf and soil analysis: A fertilizing schedule will be issued on an annual basis. Available means of nutrient application (soil application and foliar application) will be used in order to optimize nutrient use efficiency, as analyzed below. This will be a significant improvement, as compared to present status.
5. Application of organic material: Organic matters (compost, manure) will be applied 3 times during the project (winter application). In particular, 10 t/ha of compost will be added yearly during winter (dormancy of plant) along the wetted row, without exceeding the max value of 180 U of N set by the Nitrates Directive.
6. Irrigation schedule: In order to define the irrigation volumes a daily water balance calibrated on the need of the crop in relation to the climatic conditions will be calculated.
7. Deficit irrigation: During the post harvest period, a regulated deficit irrigation scheme will be applied in the demonstration plot, based upon meteorological data, monitoring sensors and the use of crop coefficients (K_C).
8. Pruning: UNIBAS research group will evaluate each year the need for pruning, in order to improve light penetration and, therefore, standardizes the quality of fruits in different zones of the canopy and remove tree suckers and watersprouts.

Monitoring

Based on the general principles of monitoring for assessing the efficiency of applied practices in demonstration plots, as compared to control plots (Action D.1), the following monitoring procedures will be performed in this pilot farm:

1. Transpiration water losses: Leaf Area Index will be measured once during summer using relevant equipment (LiCor LAI 2000) by UNIBAS personnel. The water saving obtained with pruning for reducing the transpiring surface of plant will be calculated based on LAI differences between the demonstration and the control plots. This measurement does not require the permanent installation of equipment in the orchard.
2. Soil characterization: Chemical-physical and hydrological characteristics of the soil will be studied in order to know the capacity to retain water, define the wilting point (WP) and the field capacity and the optimal threshold for the crop. Soil samples (depth 0-30 cm) will be taken 1 time at the beginning of the first implementation year (2017) in control and demonstration plots for soil characterization.
3. Nitrate leaching: Soil sampling for assessing nitrate leaching at 2 depths (50, 25 cm) in the soil portion wetted by irrigation will be performed in control and demonstration plots during the growing season at 15 day-intervals.
4. Organic fertilizers analysis: to evaluate macro and microelements quantity one analysis of organic fertilizers will be performed.

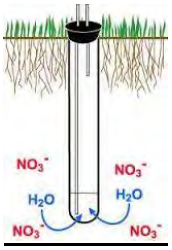
5. Assessment of orchard input (fertilizers, chopped pruning material and weeds) and output (plant nutritional request) for nutritional balance.
6. Biomass from weed mowing: quantification of biomass (dry weight) from weed mowing by a representative sub-sample will be calculated.
7. Biomass from pruning: quantification of biomass(dry weight) from pruning residues by a representative sub-sample will be calculated.
8. Fruit yield: Fruit yield in control and demonstration plots will be recorded by FOR agronomists with farmer's assistance during the harvesting period.

Equipment

The following monitoring equipment will be used in order to monitor the parameters described above.

Nitrachek 404

Nitracheck



Lysimeter

Field scale

Laboratory oven

Timer

LiCor, LAI 2000

ANNEX

List of recorded farms in Voukolies and Maleme sub-basins

ΕΘΕΛΟΝΤΕΣ ΑΓΡΟΤΕΣ ΚΑΙ ΔΙΑΘΕΣΙΜΑ ΑΓΡΟΤΕΜΑΧΙΑ ΣΤΙΣ ΠΙΛΟΤΙΚΕΣ ΥΠΟΛΕΚΑΝΕΣ ΒΟΥΚΟΛΙΕΣ - ΜΑΛΕΜΕ, ΤΟΥ ΔΗΜΟΥ ΠΛΑΤΑΝΙΑ

ΠΛΗΘΟΣ ΑΓΡΟΤΕ-ΜΑΧΙΩΝ	ΚΩΔΙΚΟΣ ΑΓΡΟΤΕ-ΜΑΧΙΩΝ	ΕΠΩΝΥΜΟ	ΟΝΟΜΑ	ΕΚΤΑΣΗ ha	ΠΕΡΙΟΧΗ	ΤΟΠΟΘΕΣΙΑ	ΕΙΔΟΣ ΚΑΛΛ	ΑΡΔΕΥΟΜΕΝΟ (ΝΑΙ/ΌΧΙ)	ΒΙΟΛΟΓΙΚΟ (Β) ΣΥΜΒΑΤΙΚΟ (Σ)
1	01.P.OL.01	**ΒΑΓΙΩΝΑΚΗ**	**ΓΕΩΡΓΙΑ**	1	ΒΟΥΚΟΛΙΕΣ	ΒΟΥΚΟΛΙΕΣ	ΕΛΙΑ	ΌΧΙ	Β
2	01.P.OL.02	ΒΑΓΙΩΝΑΚΗ	ΓΕΩΡΓΙΑ	0,7	ΒΟΥΚΟΛΙΕΣ	ΒΟΥΚΟΛΙΕΣ	ΕΛΙΑ	ΌΧΙ	Β
3	01.P.OL.03	ΒΑΓΙΩΝΑΚΗ	ΓΕΩΡΓΙΑ	0,5	ΒΟΥΚΟΛΙΕΣ	ΒΟΥΚΟΛΙΕΣ	ΕΛΙΑ	ΌΧΙ	Β
4	02.P.OL.01	**ΒΑΓΙΩΝΑΚΗΣ**	**ΝΙΚΟΛΑΟΣ**	2	ΒΟΥΚΟΛΙΕΣ	ΒΟΥΚΟΛΙΕΣ	ΕΛΙΑ	ΌΧΙ	Σ
5	02.P.OL.02	ΒΑΓΙΩΝΑΚΗΣ	ΝΙΚΟΛΑΟΣ	2	ΒΟΥΚΟΛΙΕΣ	ΒΟΥΚΟΛΙΕΣ	ΕΛΙΑ	ΌΧΙ	Σ
6	03.P.OL.01	**ΓΕΡΕΟΥΔΑΚΗΣ**	**ΑΠΟΣΤΟΛΟΣ**	0,3	ΒΟΥΚΟΛΙΕΣ	ΚΟΡΦΗ	ΕΛΙΑ	ΝΑΙ	Σ
7	03.P.OL.02	ΓΕΡΕΟΥΔΑΚΗΣ	ΑΠΟΣΤΟΛΟΣ	0,4	ΒΟΥΚΟΛΙΕΣ	ΒΟΥΚΟΛΙΕΣ	ΕΛΙΑ	ΝΑΙ	Σ
8	03.P.OL.3	ΓΕΡΕΟΥΔΑΚΗΣ	ΑΠΟΣΤΟΛΟΣ	0,8	ΒΟΥΚΟΛΙΕΣ	ΧΑΡΒΑΤΑ	ΕΛΙΑ	ΌΧΙ	Σ
9	04.C.01	**ΓΕΩΡΓΟΥΣΑΚΗΣ**	**ΓΕΩΡΓΙΟΣ**	0,5	ΒΟΥΚΟΛΙΕΣ	ΓΕΩΡΓΟΥΣΙΑΝΑ	ΠΟΡΤΟ-ΚΑΛΙΑ	ΝΑΙ	Σ
10	04.OL.02	ΓΕΩΡΓΟΥΣΑΚΗΣ	ΓΕΩΡΓΙΟΣ	1	ΒΟΥΚΟΛΙΕΣ	ΛΑΓΚΟΣ	ΕΛΙΑ	ΌΧΙ	Σ
11	04.P.OL.03	ΓΕΩΡΓΟΥΣΑΚΗΣ	ΓΕΩΡΓΙΟΣ	1	ΒΟΥΚΟΛΙΕΣ	ΤΟΥΡΚΟΛΙΔΙΑΝΑ	ΕΛΙΑ	ΌΧΙ	Σ
12	04.P.OL.04	ΓΕΩΡΓΟΥΣΑΚΗΣ	ΓΕΩΡΓΙΟΣ	0,8	ΒΟΥΚΟΛΙΕΣ	ΒΡΟΥΛΙΔΙΑ	ΕΛΙΑ	ΌΧΙ	Σ
13	05.P.OL.01	**ΓΕΩΡΓΟΥΣΑΚΗΣ**	**ΧΑΡΙΛΑΟΣ**	0,7	ΒΟΥΚΟΛΙΕΣ	ΠΛΑΚΑ	ΕΛΙΑ	ΝΑΙ	Σ
14	05.P.OL.02	ΓΕΩΡΓΟΥΣΑΚΗΣ	ΧΑΡΙΛΑΟΣ	1,2	ΒΟΥΚΟΛΙΕΣ	ΧΑΡΒΑΤΑ	ΕΛΙΑ	ΌΧΙ	Σ
15	05.P.OL.03	ΓΕΩΡΓΟΥΣΑΚΗΣ	ΧΑΡΙΛΑΟΣ	0,5	ΒΟΥΚΟΛΙΕΣ	ΚΟΥΒΑΡΕΣ	ΕΛΙΑ	ΝΑΙ	Σ
16	06.P.OL.01	**ΔΑΣΚΑΛΑΚΗΣ**	**ΔΗΜΟΚΡΙΤΟΣ**	1,5	ΒΟΥΚΟΛΙΕΣ	ΤΖΕΜΑΝΟΥ	ΕΛΙΑ	ΌΧΙ	Σ
17	06.P.OL.02	ΔΑΣΚΑΛΑΚΗΣ	ΔΗΜΟΚΡΙΤΟΣ	0,6	ΒΟΥΚΟΛΙΕΣ	ΚΟΠΡΑΝΟ	ΕΛΙΑ	ΝΑΙ	Σ
18	06.P.OL.03	ΔΑΣΚΑΛΑΚΗΣ	ΔΗΜΟΚΡΙΤΟΣ	0,8	ΒΟΥΚΟΛΙΕΣ	ΜΑΝΙΟΛΟΠΟΥΛΟ	ΕΛΙΑ	ΝΑΙ	Σ
19	06.P.OL.04	ΔΑΣΚΑΛΑΚΗΣ	ΔΗΜΟΚΡΙΤΟΣ	0,5	ΒΟΥΚΟΛΙΕΣ	ΨΑΘΟΓΙΑΝΟΣ	ΕΛΙΑ	ΝΑΙ	Σ
20	07.P.OL.01	**ΔΙΑΛΥΝΑΚΗΣ**	**ΒΑΣΙΛΕΙΟΣ**	0,5	ΒΟΥΚΟΛΙΕΣ	ΑΝΑΤΟΛΙΚΑ	ΕΛΙΑ	ΝΑΙ	Σ
21	07.P.OL.02	ΔΙΑΛΥΝΑΚΗΣ	ΒΑΣΙΛΕΙΟΣ	1,3	ΒΟΥΚΟΛΙΕΣ	ΜΑΚΡΥΣ ΛΑΓΓΟΣ	ΕΛΙΑ	ΝΑΙ	Σ
22	07.P.OL.03	ΔΙΑΛΥΝΑΚΗΣ	ΒΑΣΙΛΕΙΟΣ	0,4	ΒΟΥΚΟΛΙΕΣ	ΣΧΟΛΕΙΟ	ΕΛΙΑ	ΌΧΙ	Σ
23	07.P.OL.04	ΔΙΑΛΥΝΑΚΗΣ	ΒΑΣΙΛΕΙΟΣ	0,4	ΒΟΥΚΟΛΙΕΣ	ΧΑΛΑΡΑ	ΕΛΙΑ	ΝΑΙ	Σ
24	08.P.OL.01	**ΔΙΓΕΝΑΚΗΣ**	**ΜΙΧΑΗΛ**	0,5	ΜΑΛΕΜΕ	ΓΑΡΜΠΗΣ	ΕΛΙΑ	ΌΧΙ	Β
25	08.P.OL.02	ΔΙΓΕΝΑΚΗΣ	ΜΙΧΑΗΛ	0,4	ΜΑΛΕΜΕ	ΣΙΔΕΡΟΠΟΡΤΗ	ΕΛΙΑ	ΌΧΙ	Β
26	08.P.OL.03	ΔΙΓΕΝΑΚΗΣ	ΜΙΧΑΗΛ	0,6	ΜΑΛΕΜΕ	ΣΠΙΤΙ	ΕΛΙΑ	ΌΧΙ	Β
27	09.P.OL.01	**ΔΡΑΚΟΥΛΑΚΗΣ**	**ΜΑΡΙΝΟΣ**	0,4	ΜΑΛΕΜΕ	ΓΕΡΟΣ ΣΚΙΝΟΣ	ΕΛΙΑ	ΝΑΙ	Σ
28	09.P.OL.02	ΔΡΑΚΟΥΛΑΚΗΣ	ΜΑΡΙΝΟΣ	1	ΜΑΛΕΜΕ	ΜΟΥΡΑΚΙ	ΕΛΙΑ	ΝΑΙ	Σ
29	09.P.OL.03	ΔΡΑΚΟΥΛΑΚΗΣ	ΜΑΡΙΝΟΣ	0,4	ΜΑΛΕΜΕ	ΒΑΤΟΥΔΕΣ	ΕΛΙΑ	ΝΑΙ	Σ
30	09.P.OL.04	ΔΡΑΚΟΥΛΑΚΗΣ	ΜΑΡΙΝΟΣ	0,4	ΜΑΛΕΜΕ	ΣΑΜΑΡΙΑΝΑ	ΕΛΙΑ	ΝΑΙ	Σ
31	10.P.OL.01	**ΔΡΑΚΟΥΛΑΚΗΣ**	**ΝΙΚΟΛΑΟΣ**	0,3	ΜΑΛΕΜΕ	ΜΑΥΡΟΓΕΝΗ	ΕΛΙΑ	ΌΧΙ	Σ
32	10.P.OL.02	ΔΡΑΚΟΥΛΑΚΗΣ	ΝΙΚΟΛΑΟΣ	0,4	ΜΑΛΕΜΕ	ΠΑΤΑΡΙ	ΕΛΙΑ	ΌΧΙ	Σ
33	10.P.OL.03	ΔΡΑΚΟΥΛΑΚΗΣ	ΝΙΚΟΛΑΟΣ	0,7	ΜΑΛΕΜΕ	ΣΤΑΒΛΟΣ	ΕΛΙΑ	ΌΧΙ	Σ
34	10.P.OL.04	ΔΡΑΚΟΥΛΑΚΗΣ	ΝΙΚΟΛΑΟΣ	1	ΜΑΛΕΜΕ	ΣΤΑΦΙΔΑ	ΕΛΙΑ	ΌΧΙ	Σ
35	11.P.OL.01	**ΘΩΜΑΚΗΣ**	**ΣΤΥΛΙΑΝΟΣ**	0,4	ΒΟΥΚΟΛΙΕΣ	ΚΑΜΠΟΣ	ΕΛΙΑ	ΝΑΙ	Σ
36	11.P.OL.02	ΘΩΜΑΚΗΣ	ΣΤΥΛΙΑΝΟΣ	1	ΒΟΥΚΟΛΙΕΣ	ΚΟΡΦΗ	ΕΛΙΑ	ΝΑΙ	Σ
37	11.P.OL.03	ΘΩΜΑΚΗΣ	ΣΤΥΛΙΑΝΟΣ	0,4	ΒΟΥΚΟΛΙΕΣ	ΧΑΡΑΚΙ	ΕΛΙΑ	ΝΑΙ	Σ
38	11.P.OL.04	ΘΩΜΑΚΗΣ	ΣΤΥΛΙΑΝΟΣ	0,5	ΒΟΥΚΟΛΙΕΣ	ΜΕΛΙΣΣΕΣ	ΕΛΙΑ	ΝΑΙ	Σ
39	12.P.OL.01	**ΚΑΛΑΙΤΖΑΚΗΣ**	**ΓΕΩΡΓΙΟΣ**	0,4	ΒΟΥΚΟΛΙΕΣ	ΤΖΑΜΟΛΙΔΙΑ	ΕΛΙΑ	ΝΑΙ	Σ
40	12.P.OL.02	ΚΑΛΑΙΤΖΑΚΗΣ	ΓΕΩΡΓΙΟΣ	0,5	ΒΟΥΚΟΛΙΕΣ	ΑΓΙΟΣ ΑΝΤΩΝΙΟΣ	ΕΛΙΑ	ΝΑΙ	Σ
41	13.P.A.01	**ΚΑΛΑΙΤΖΑΚΗΣ**	**ΧΑΡΑΛΑΜΠΟΣ**	0,3	ΒΟΥΚΟΛΙΕΣ	ΦΑΦΑΛΑΙΑΝΑ	ΑΒΟΚΑ-ΝΤΟ	ΌΧΙ	-
42	13.P.OL.02	ΚΑΛΑΙΤΖΑΚΗΣ	ΧΑΡΑΛΑΜΠΟΣ	1,4	ΒΟΥΚΟΛΙΕΣ	ΠΥΡΓΟΣ	ΕΛΙΑ	ΌΧΙ	Σ

ΕΘΕΛΟΝΤΕΣ ΑΓΡΟΤΕΣ ΚΑΙ ΔΙΑΘΕΣΙΜΑ ΑΓΡΟΤΕΜΑΧΙΑ ΣΤΙΣ ΠΙΛΟΤΙΚΕΣ ΥΠΟΛΕΚΑΝΕΣ ΒΟΥΚΟΛΙΕΣ - ΜΑΛΕΜΕ, ΤΟΥ ΔΗΜΟΥ ΠΛΑΤΑΝΙΑ

43	13.P.OL.03	ΚΑΛΑΙΤΖΑΚΗΣ	ΧΑΡΑΛΑΜΠΟΣ	0,6	ΒΟΥΚΟΛΙΕΣ	ΝΕΜΠΡΟΣ	ΕΛΙΑ	ΌΧΙ	Σ
44	14.P.OL.01	**ΚΑΜΠΟΥΡΑΚΗΣ**	**ΓΕΩΡΓΙΟΣ**	0,4	ΒΟΥΚΟΛΙΕΣ	ΤΖΟΜΠΡΙΣΤΑΚΑΣ	ΕΛΙΑ	ΝΑΙ	Σ
45	14.P.OL.02	ΚΑΜΠΟΥΡΑΚΗΣ	ΓΕΩΡΓΙΟΣ	0,4	ΒΟΥΚΟΛΙΕΣ	ΚΕΝΤΡΑΔΕΣ	ΕΛΙΑ	ΝΑΙ	Σ
46	16.P.OL.01	**ΚΑΜΠΟΥΡΑΚΗΣ**	**ΔΗΜΗΤΡΙΟΣ**		ΒΟΥΚΟΛΙΕΣ	ΜΑΧΑΙΡΙΔΑ	ΕΛΙΑ	ΝΑΙ	Σ
47	16.P.OL.02	ΚΑΜΠΟΥΡΑΚΗΣ	ΔΗΜΗΤΡΙΟΣ	0,4	ΒΟΥΚΟΛΙΕΣ	ΠΕΡΑ ΧΩΡΑΦΙΑ	ΕΛΙΑ	ΝΑΙ	Σ
48	16.P.OL.03	ΚΑΜΠΟΥΡΑΚΗΣ	ΔΗΜΗΤΡΙΟΣ	0,6	ΒΟΥΚΟΛΙΕΣ	ΚΟΡΑΚΑ	ΕΛΙΑ	ΝΑΙ	Σ
49	17.P.OL.01	**ΚΑΝΤΙΛΑΚΗ**	**ΑΙΚΑΤΕΡΙΝΗ**	2	ΒΟΥΚΟΛΙΕΣ	ΕΙΚΟΝΟΣΤΑΣΗ	ΕΛΙΑ	ΝΑΙ	Σ
50	17.P.OL.02	ΚΑΝΤΙΛΑΚΗ	ΑΙΚΑΤΕΡΙΝΗ	2	ΒΟΥΚΟΛΙΕΣ	ΑΜΟΥΤΣΕΣ	ΕΛΙΑ	ΝΑΙ	Σ
51	18.P.OL.01	**ΚΑΡΙΩΤΑΚΗ**	**ΣΠΥΡΙΔΟΥΛΑ**	2	ΒΟΥΚΟΛΙΕΣ	ΚΟΡΑΚΑ	ΕΛΙΑ	ΝΑΙ	Β
52	18.P.OL.02	ΚΑΡΙΩΤΑΚΗ	ΣΠΥΡΙΔΟΥΛΑ	1,1	ΒΟΥΚΟΛΙΕΣ	ΠΕΡΑ ΧΩΡΑΦΙΑ	ΕΛΙΑ	ΝΑΙ	Β
53	18.P.OL.03	ΚΑΡΙΩΤΑΚΗ	ΣΠΥΡΙΔΟΥΛΑ	0,4	ΒΟΥΚΟΛΙΕΣ	ΑΧΛΑΔΟΚΑΜΠΟΣ	ΕΛΙΑ	ΝΑΙ	Β
54	18.P.C.04	ΚΑΡΙΩΤΑΚΗ	ΣΠΥΡΙΔΟΥΛΑ	0,4	ΒΟΥΚΟΛΙΕΣ	ΣΚΑΛΙ	ΠΟΡΤΟΚ ΑΛΙΑ	ΝΑΙ	Β
55	19.P.C.01	**ΜΑΜΙΔΑΚΗΣ**	**ΙΩΑΝΝΗΣ**	0,4	ΒΟΥΚΟΛΙΕΣ	ΚΑΜΠΟΣ	ΠΟΡΤΟ-ΚΑΛΙΑ	ΝΑΙ	Σ
56	19.P.OL.02	ΜΑΜΙΔΑΚΗΣ	ΙΩΑΝΝΗΣ	0,6	ΒΟΥΚΟΛΙΕΣ	ΚΟΡΝΑΡΟΣ	ΕΛΙΑ	ΌΧΙ	Σ
57	19.P.OL.03	ΜΑΜΙΔΑΚΗΣ	ΙΩΑΝΝΗΣ	0,7	ΒΟΥΚΟΛΙΕΣ	ΔΑΧΤΥΛΙΝΕΣ	ΕΛΙΑ	ΌΧΙ	Σ
58	19..OL.04	ΜΑΜΙΔΑΚΗΣ	ΙΩΑΝΝΗΣ	0,6	ΒΟΥΚΟΛΙΕΣ	ΚΟΡΦΗ	ΕΛΙΑ	ΌΧΙ	Σ
59	20.P.OL.01	**ΜΑΡΚΟΥΛΑΚΗ**	**ΜΑΡΙΑ**	0,9	ΒΟΥΚΟΛΙΕΣ	ΣΤΕΡΝΑ	ΕΛΙΑ	ΌΧΙ	Σ
60	20.P.OL.02	ΜΑΡΚΟΥΛΑΚΗ	ΜΑΡΙΑ	0,8	ΒΟΥΚΟΛΙΕΣ	ΣΜΑΛΙΑΝΑ	ΕΛΙΑ	ΌΧΙ	Σ
61	20.P.OL.03	ΜΑΡΚΟΥΛΑΚΗ	ΜΑΡΙΑ	0,4	ΒΟΥΚΟΛΙΕΣ	ΠΑΝΩ ΠΛΑΤΗ	ΕΛΙΑ	ΌΧΙ	Σ
62	20.P.OL.04	ΜΑΡΚΟΥΛΑΚΗ	ΜΑΡΙΑ	0,5	ΒΟΥΚΟΛΙΕΣ	ΚΟΡΦΗ	ΕΛΙΑ	ΌΧΙ	Σ
63	21.P.C.01	**ΝΙΚΟΛΑΚΑΚΗ**	**ΜΑΡΙΑ**	1	ΒΟΥΚΟΛΙΕΣ	ΣΚΟΤΕΙΝΟ	ΠΟΡΤΟ-ΚΑΛΙΑ	ΝΑΙ	Σ
64	21.P.OL.02	ΝΙΚΟΛΑΚΑΚΗ	ΜΑΡΙΑ	0,5	ΒΟΥΚΟΛΙΕΣ	ΚΟΡΑΚΙΑ	ΕΛΙΑ	ΝΑΙ	Σ
65	21.P.OL.03	ΝΙΚΟΛΑΚΑΚΗ	ΜΑΡΙΑ	0,3	ΒΟΥΚΟΛΙΕΣ	ΠΗΓΑΔΙ	ΕΛΙΑ	ΝΑΙ	Σ
66	21.P.OL.04	ΝΙΚΟΛΑΚΑΚΗ	ΜΑΡΙΑ	1	ΒΟΥΚΟΛΙΕΣ	ΒΡΥΣΗ	ΕΛΙΑ	ΌΧΙ	Σ
67	22.P.OL.01	**ΝΙΚΟΛΑΚΑΚΗΣ**	**ΝΙΚΟΛΑΟΣ**	0,4	ΒΟΥΚΟΛΙΕΣ	ΑΓΑΔΙΚΗ	ΕΛΙΑ	ΌΧΙ	Β
68	22.P.OL.02	ΝΙΚΟΛΑΚΑΚΗΣ	ΝΙΚΟΛΑΟΣ	1,1	ΒΟΥΚΟΛΙΕΣ	ΚΟΥΚΟΥΛΑ	ΕΛΙΑ	ΌΧΙ	Β
69	22.P.OL.03	ΝΙΚΟΛΑΚΑΚΗΣ	ΝΙΚΟΛΑΟΣ	0,5	ΒΟΥΚΟΛΙΕΣ	ΛΟΔΩΝΑΣ	ΕΛΙΑ	ΌΧΙ	Β
70	22.P.OL.04	ΝΙΚΟΛΑΚΑΚΗΣ	ΝΙΚΟΛΑΟΣ	1,2	ΒΟΥΚΟΛΙΕΣ	ΜΑΡΑΘΕΣ	ΕΛΙΑ	ΌΧΙ	Β
71	23.P.C.01	**ΠΑΝΑΝΟΥΔΑΚΗΣ**	**ΝΙΚΟΛΑΟΣ**	0,5	ΜΑΛΕΜΕ	ΣΚΟΤΕΙΝΗ	ΠΟΡΤΟ-ΚΑΛΙΑ	ΝΑΙ	Σ
72	23.P.OL.02	ΠΑΝΑΝΟΥΔΑΚΗΣ	ΝΙΚΟΛΑΟΣ	1,5	ΜΑΛΕΜΕ	ΚΑΜΙΝΑΚΙΑ	ΕΛΙΑ	ΝΑΙ	Σ
73	23.P.OL.03	ΠΑΝΑΝΟΥΔΑΚΗΣ	ΝΙΚΟΛΑΟΣ	0,4	ΜΑΛΕΜΕ	ΜΑΤΖΟΡΟ	ΕΛΙΑ	ΝΑΙ	Σ
74	23.P.OL.04	ΠΑΝΑΝΟΥΔΑΚΗΣ	ΝΙΚΟΛΑΟΣ	0,5	ΜΑΛΕΜΕ	ΤΖΙΓΚΟΥΝΙΑ	ΕΛΙΑ	ΝΑΙ	Σ
75	24.P.OL.01	**ΠΑΡΑΣΚΑΚΗΣ**	**ΑΛΕΞΑΝΔΡΟΣ**	1,5	ΜΑΛΕΜΕ	ΛΑΓΚΟΣ	ΕΛΙΑ	ΝΑΙ	Σ
76	24.P.OL.02	ΠΑΡΑΣΚΑΚΗΣ	ΑΛΕΞΑΝΔΡΟΣ	0,7	ΜΑΛΕΜΕ	ΑΛΩΝΙΑ	ΕΛΙΑ	ΝΑΙ	Σ
77	24.P.OL.03	ΠΑΡΑΣΚΑΚΗΣ	ΑΛΕΞΑΝΔΡΟΣ	0,5	ΜΑΛΕΜΕ	ΑΛΩΝΙΑ	ΕΛΙΑ	ΝΑΙ	Σ
78	24.P.OL.04	ΠΑΡΑΣΚΑΚΗΣ	ΑΛΕΞΑΝΔΡΟΣ	0,3	ΜΑΛΕΜΕ	ΑΝΔΡΕΟΓΙΩΡΓΗ	ΕΛΙΑ	ΝΑΙ	Σ
79	25.P.C.01	**ΠΑΡΑΣΚΑΚΗΣ**	**ΕΜΜΑΝΟΥΗΛ**	0,5	ΜΑΛΕΜΕ	ΣΚΙΝΟΣ	ΠΟΡΤΟ-ΚΑΛΙΑ	ΝΑΙ	Σ
80	25.P.OL.02	ΠΑΡΑΣΚΑΚΗΣ	ΕΜΜΑΝΟΥΗΛ	0,4	ΜΑΛΕΜΕ	ΚΟΜΟΛΙΘΕΣ	ΕΛΙΑ	ΝΑΙ	Σ
81	25.P.OL.03	ΠΑΡΑΣΚΑΚΗΣ	ΕΜΜΑΝΟΥΗΛ	0,4	ΜΑΛΕΜΕ	ΠΥΡΟΛΙΚΙ	ΕΛΙΑ	ΝΑΙ	Σ
82	25.P.OL.04	ΠΑΡΑΣΚΑΚΗΣ	ΕΜΜΑΝΟΥΗΛ	0,4	ΜΑΛΕΜΕ	ΕΚΚΛΗΣΙΑ	ΕΛΙΑ	ΝΑΙ	Σ
83	26.P.C.01	**ΣΑΡΡΗΣ**	**ΜΙΧΑΗΛ**	0,4	ΜΑΛΕΜΕ	ΑΙ ΓΙΩΡΓΗΣ	ΛΕΜΟ-ΝΙΑ	ΝΑΙ	Σ
84	26.P.OL.02	ΣΑΡΡΗΣ	ΜΙΧΑΗΛ	0,7	ΜΑΛΕΜΕ	ΧΟΙΡΟΣΤΑΣΙΟ	ΕΛΙΑ	ΌΧΙ	Σ
85	26.P.OL.03	ΣΑΡΡΗΣ	ΜΙΧΑΗΛ	0,6	ΜΑΛΕΜΕ	ΣΕΛΙ	ΕΛΙΑ	ΌΧΙ	Σ

ΕΘΕΛΟΝΤΕΣ ΑΓΡΟΤΕΣ ΚΑΙ ΔΙΑΘΕΣΙΜΑ ΑΓΡΟΤΕΜΑΧΙΑ ΣΤΙΣ ΠΙΛΟΤΙΚΕΣ ΥΠΟΛΕΚΑΝΕΣ ΒΟΥΚΟΛΙΕΣ - ΜΑΛΕΜΕ, ΤΟΥ ΔΗΜΟΥ ΠΛΑΤΑΝΙΑ

86	26.P.OL.04	ΣΑΡΡΗΣ	ΜΙΧΑΗΛ	0,7	ΜΑΛΕΜΕ	ΓΕΡΑΝΙ	ΕΛΙΑ	'ΟΧΙ	Σ
87	27.P.OL.01	**ΣΤΑΜΑΤΑΚΗΣ**	**ΒΑΣΙΛΕΙΟΣ**	0,6	ΒΟΥΚΟΛΙΕΣ	ΤΡΑΧΑΛΑ	ΕΛΙΑ	'ΟΧΙ	Β
88	27.P.OL.02	ΣΤΑΜΑΤΑΚΗΣ	ΒΑΣΙΛΕΙΟΣ	0,6	ΒΟΥΚΟΛΙΕΣ	ΜΟΙΡΑ	ΕΛΙΑ	'ΟΧΙ	Β
89	27.P.OL.03	ΣΤΑΜΑΤΑΚΗΣ	ΒΑΣΙΛΕΙΟΣ	1,4	ΒΟΥΚΟΛΙΕΣ	ΧΑΛΙΚΙΑΡΙΚΑ	ΕΛΙΑ	'ΟΧΙ	Β
90	28.P.C.01	**ΑΝΤΩΝΟΓΙΑΝΝΑΚΗ**	**ΜΑΡΙΑ**	2	ΒΟΥΚΟΛΙΕΣ		ΠΟΡΤΟ-ΚΑΛΙΑ	ΝΑΙ	Σ
91	28.P.OL.02	ΑΝΤΩΝΟΓΙΑΝΝΑΚΗ	ΜΑΡΙΑ	0,4	ΒΟΥΚΟΛΙΕΣ	ΛΑΓΓΟΣ	ΕΛΙΑ	ΝΑΙ	Σ
92	28.P.OL.03	ΑΝΤΩΝΟΓΙΑΝΝΑΚΗ	ΜΑΡΙΑ	0,4	ΒΟΥΚΟΛΙΕΣ	ΠΕΡΑ ΧΩΡΑΦΙΑ	ΕΛΙΑ	ΝΑΙ	Σ
93	28.P.OL.04	ΑΝΤΩΝΟΓΙΑΝΝΑΚΗ	ΜΑΡΙΑ	0,8	ΒΟΥΚΟΛΙΕΣ	ΣΚΟΤΕΙΝΟ	ΕΛΙΑ	ΝΑΙ	Σ
94	28.P.OL.01	**ΦΥΛΛΑΔΙΤΑΚΗΣ**	**ΜΑΤΘΑΙΟΣ**	0,4	ΒΟΥΚΟΛΙΕΣ	ΧΑΡΒΑΡΑ	ΕΛΙΑ	'ΟΧΙ	Σ
95	28.P.OL.02	ΦΥΛΛΑΔΙΤΑΚΗΣ	ΜΑΤΘΑΙΟΣ	1,2	ΒΟΥΚΟΛΙΕΣ	ΜΑΥΡΟΠΟΥΛΙ	ΕΛΙΑ	ΝΑΙ	Σ
96	28.P.OL.03	ΦΥΛΛΑΔΙΤΑΚΗΣ	ΜΑΤΘΑΙΟΣ	0,6	ΜΑΛΕΜΕ	ΛΙΜΝΗ	ΕΛΙΑ	ΝΑΙ	Σ
97	29.P.OL.01	**ΛΕΒΕΝΤΑΚΗΣ**	**ΑΝΤΩΝΙΟΣ**	1,2	ΜΑΛΕΜΕ	ΛΑΚΟΙ	ΕΛΙΑ	'ΟΧΙ	Σ
98	29.P.OL.02	ΛΕΒΕΝΤΑΚΗΣ	ΑΝΤΩΝΙΟΣ	0,4	ΜΑΛΕΜΕ	ΚΑΒΟΥΣΙΑ	ΕΛΙΑ	'ΟΧΙ	Σ
99	29.P.OL.03	ΛΕΒΕΝΤΑΚΗΣ	ΑΝΤΩΝΙΟΣ	0,5	ΜΑΛΕΜΕ	ΜΑΥΡΙΣ	ΕΛΙΑ	'ΟΧΙ	Σ
100	29.P.OL.04	ΛΕΒΕΝΤΑΚΗΣ	ΑΝΤΩΝΙΟΣ	1,2	ΜΑΛΕΜΕ	ΜΑΥΡΗΣ	ΕΛΙΑ	'ΟΧΙ	Σ

List of recorded farms in Havgas-Milatos sub-basins

ΕΘΕΛΟΝΤΕΣ ΑΓΡΟΤΕΣ ΚΑΙ ΔΙΑΘΕΣΙΜΑ ΑΓΡΟΤΕΜΑΧΙΑ ΣΤΗΝ ΠΙΛΟΤΙΚΗ ΛΕΚΑΝΗ ΧΑΥΓΑ-ΜΙΛΑΤΟΥ, ΤΟΥ ΔΗΜΟΥ ΑΓΙΟΥ ΝΙΚΟΛΑΟΥ									
ΠΛΗΘΟΣ ΑΓΡΟΤΕ-ΜΑΧΙΩΝ	ΚΩΔΙΚΟΣ ΑΓΡΟΤΕ-ΜΑΧΙΩΝ	ΕΠΩΝΥΜΟ	ΟΝΟΜΑ	ΕΚΤΑΣΗ ha	ΚΟΙΝΟΤΗΤΑ	ΤΟΠΟΘΕΣΙΑ	ΕΙΔΟΣ ΚΑΛΛ	ΑΡΔΕΥΟΜΕΝΟ (ΝΑΙ/ΌΧΙ)	ΒΙΟΛΟΓΙΚΟ (Β) ΣΥΜΒΑΤΙΚΟ (Σ)
1	1.01	**ΑΛΕΞΑΚΗΣ**	**ΣΤΕΦΑΝΟΣ**	0,15	ΝΕΑΠΟΛΗ	ΚΟΥΤΣΟΥΝΑΡΙ	ΕΛΙΑ	ΌΧΙ	Σ
2	1.02	ΑΛΕΞΑΚΗΣ	ΣΤΕΦΑΝΟΣ	0,13	ΝΕΑΠΟΛΗ	ΑΡΑΚΑ ΧΑΝΙ	ΕΛΙΑ	ΌΧΙ	Σ
3	2.01	**ΑΝΑΣΤΑΣΑΚΗΣ-ΧΟΥΡΔΑΚΗΣ**	**ΙΩΑΝΝΗΣ**	1,2	ΒΟΥΛΙΣΜΕΝΗ	ΦΡΑΜΑΤΑ	ΕΛΙΑ	ΌΧΙ	Σ
4	2.02	ΑΝΑΣΤΑΣΑΚΗΣ-ΧΟΥΡΔΑΚΗΣ	ΙΩΑΝΝΗΣ	0,19	ΒΟΥΛΙΣΜΕΝΗ	ΚΑΤΩ ΛΑΚΟΙ	ΕΛΙΑ	ΌΧΙ	Σ
5	2.03	ΑΝΑΣΤΑΣΑΚΗΣ-ΧΟΥΡΔΑΚΗΣ	ΙΩΑΝΝΗΣ	0,16	ΒΟΥΛΙΣΜΕΝΗ	ΜΑΖΙ	ΕΛΙΑ	ΌΧΙ	Σ
6	3.01	**ΑΣΤΡΟΥΛΑΚΗΣ**	**ΣΩΚΡΑΤΗΣ**	0,3	ΜΙΛΑΤΟΣ	ΝΟΤΙΚΟ	ΕΛΙΑ	ΌΧΙ	Β
7	3.02	ΑΣΤΡΟΥΛΑΚΗΣ	ΣΩΚΡΑΤΗΣ	0,33	ΜΙΛΑΤΟΣ	ΞΥΛΟΔΕΜΑ	ΕΛΙΑ	ΌΧΙ	Β
8	4.01	**ΒΕΝΕΤΟΥ**	**ΚΑΛΛΙΟΠΗ**	0,31	ΑΓΙΟΣ ΝΙΚΟΛΑΟΣ	ΜΕΣΟΧΗΡΙ 2	ΕΛΙΑ	ΌΧΙ	Σ
9	4.02	ΒΕΝΕΤΟΥ	ΚΑΛΛΙΟΠΗ	0,2	ΑΓΙΟΣ ΝΙΚΟΛΑΟΣ	ΜΕΣΟΧΗΡΙ 1	ΕΛΙΑ	ΌΧΙ	Σ
10	4.03	ΒΕΝΕΤΟΥ	ΚΑΛΛΙΟΠΗ	0,2	ΑΓΙΟΣ ΝΙΚΟΛΑΟΣ	ΣΙΔΕΡΟΥ	ΕΛΙΑ	ΌΧΙ	Σ
11	4.04	ΒΕΝΕΤΟΥ	ΚΑΛΛΙΟΠΗ	0,14	ΑΓΙΟΣ ΝΙΚΟΛΑΟΣ	ΑΡΜΟΣ ΝΟΤΙΚΟ	ΕΛΙΑ	ΌΧΙ	Σ
12	5.01	**ΓΕΩΡΓΑΝΑΚΗΣ**	**ΕΜΜΑΝΟΥΗΛ**	0,4	ΛΑΤΣΙΔΑ	ΣΙΔΕΡΟΥ	ΕΛΙΑ	ΌΧΙ	Σ
13	5.02	ΓΕΩΡΓΑΝΑΚΗΣ	ΕΜΜΑΝΟΥΗΛ	0,15	ΛΑΤΣΙΔΑ	ΠΑΛΑΙΜΥΛΟΣ 1	ΕΛΙΑ	ΌΧΙ	Σ
14	5.03	ΓΕΩΡΓΑΝΑΚΗΣ	ΕΜΜΑΝΟΥΗΛ	0,18	ΛΑΤΣΙΔΑ	ΠΑΛΑΙΜΥΛΟΣ 2	ΕΛΙΑ	ΌΧΙ	Σ
15	5.04	ΓΕΩΡΓΑΝΑΚΗΣ	ΕΜΜΑΝΟΥΗΛ	0,19	ΛΑΤΣΙΔΑ	ΠΕΡΑ ΜΕΡΑ	ΕΛΙΑ	ΌΧΙ	Σ
16	6.01	**ΓΙΟΥΡΓΟΣ**	**ΕΜΜΑΝΟΥΗΛ**	0,14	ΒΟΥΛΙΣΜΕΝΗ	ΞΕΡΙΖΩΜΑ	ΕΛΙΑ	ΌΧΙ	Σ
17	6.02	ΓΙΟΥΡΓΟΣ	ΕΜΜΑΝΟΥΗΛ	0,6	ΒΟΥΛΙΣΜΕΝΗ	ΓΑΖΩΤΗ	ΕΛΙΑ	ΌΧΙ	Σ
18	7.01	**ΔΙΝΕΡΑΚΗΣ**	**ΕΜΜΑΝΟΥΗΛ**	0,98	ΛΑΤΣΙΔΑ	ΚΑΛΑΡΙΤΗΣ	ΕΛΙΑ	ΝΑΙ	Σ
19	7.02	ΔΙΝΕΡΑΚΗΣ	ΕΜΜΑΝΟΥΗΛ	0,1	ΛΑΤΣΙΔΑ	ΠΕΡΑ ΜΕΡΑ	ΕΛΙΑ	ΌΧΙ	Σ
20	7.03	ΔΙΝΕΡΑΚΗΣ	ΕΜΜΑΝΟΥΗΛ	0,4	ΛΑΤΣΙΔΑ	ΑΧΛΑΔΙΑ	ΕΛΙΑ	ΌΧΙ	Σ
21	7.04	ΔΙΝΕΡΑΚΗΣ	ΕΜΜΑΝΟΥΗΛ	0,49	ΛΑΤΣΙΔΑ	ΣΚΥΛΟΠΛΑΤΑΝΟ	ΕΛΙΑ	ΌΧΙ	Σ
22	7.05	ΔΙΝΕΡΑΚΗΣ	ΕΜΜΑΝΟΥΗΛ	0,13	ΛΑΤΣΙΔΑ	ΠΑΝΑΓΙΑ	ΕΛΙΑ	ΌΧΙ	Σ
23	7.06	ΔΙΝΕΡΑΚΗΣ	ΕΜΜΑΝΟΥΗΛ	0,1	ΛΑΤΣΙΔΑ	ΛΑΤΣΙΔΑ	ΕΛΙΑ	ΝΑΙ	Σ
24	8.01	**ΔΙΝΕΡΑΚΗΣ**	**ΚΩΝΣΤΑΝΤΙΝΟΣ**	0,8	ΝΕΑΠΟΛΗ	ΚΑΡΔΑΜΟΥΤΣΑ	ΕΛΙΑ	ΝΑΙ	Σ
25	8.02	ΔΙΝΕΡΑΚΗΣ	ΚΩΝΣΤΑΝΤΙΝΟΣ	0,3	ΝΕΑΠΟΛΗ	ΑΡΜΟΣ 1	ΕΛΙΑ	ΌΧΙ	Σ
26	8.03	ΔΙΝΕΡΑΚΗΣ	ΚΩΝΣΤΑΝΤΙΝΟΣ	0,3	ΝΕΑΠΟΛΗ	ΑΡΜΟΣ 2	ΕΛΙΑ	ΌΧΙ	Σ
27	8.04	ΔΙΝΕΡΑΚΗΣ	ΚΩΝΣΤΑΝΤΙΝΟΣ	0,19	ΝΕΑΠΟΛΗ	ΣΙΔΕΡΟΥ	ΕΛΙΑ	ΌΧΙ	Σ
28	8.05	ΔΙΝΕΡΑΚΗΣ	ΚΩΝΣΤΑΝΤΙΝΟΣ	0,1	ΝΕΑΠΟΛΗ	ΛΕΙΒΑΔΙΑ	ΕΛΙΑ	ΌΧΙ	Σ
29	8.06	ΔΙΝΕΡΑΚΗΣ	ΚΩΝΣΤΑΝΤΙΝΟΣ	0,09	ΝΕΑΠΟΛΗ	ΚΩΝΣΤΑΝΤΑΚΗ	ΕΛΙΑ	ΌΧΙ	Σ
30	9.01	**ΔΙΝΕΡΑΚΗΣ**	**ΖΑΧΑΡΙΑΣ**	1	ΑΓΙΟΣ ΝΙΚΟΛΑΟΣ	ΜΕΡΜΥΓΚΑΣ	ΕΛΙΑ	ΌΧΙ	Σ
31	9.02	ΔΙΝΕΡΑΚΗΣ	ΖΑΧΑΡΙΑΣ	0,1	ΑΓΙΟΣ ΝΙΚΟΛΑΟΣ	ΠΕΡΑ ΠΟΤΑΜΟΣ	ΕΛΙΑ	ΌΧΙ	Σ
32	9.03	ΔΙΝΕΡΑΚΗΣ	ΖΑΧΑΡΙΑΣ	0,1	ΑΓΙΟΣ ΝΙΚΟΛΑΟΣ	ΧΕΛΙΔΟΝΙΑ	ΕΛΙΑ	ΌΧΙ	Σ
33	11.01	**ΛΑΣΙΘΙΩΤΑΚΗΣ**	**ΓΕΩΡΓΙΟΣ**	0,54	ΜΙΛΑΤΟΣ	ΒΙΤΣΙΛΙΑ 1	ΕΛΙΑ	ΌΧΙ	Σ
34	11.03	ΛΑΣΙΘΙΩΤΑΚΗΣ	ΓΕΩΡΓΙΟΣ	0,11	ΜΙΛΑΤΟΣ	ΠΡΙΝΟΝΕΡΟ	ΕΛΙΑ	ΌΧΙ	Σ
35	11.04	ΛΑΣΙΘΙΩΤΑΚΗΣ	ΓΕΩΡΓΙΟΣ	0,3	ΜΙΛΑΤΟΣ	ΒΙΤΣΙΛΙΑ 2	ΕΛΙΑ	ΌΧΙ	Σ
36	11.05	ΛΑΣΙΘΙΩΤΑΚΗΣ	ΓΕΩΡΓΙΟΣ	0,1	ΜΙΛΑΤΟΣ	ΑΦΕΝΤΗΣ ΧΡΙΣΤΟΣ	ΕΛΙΑ	ΌΧΙ	Σ
37	11.06	ΛΑΣΙΘΙΩΤΑΚΗΣ	ΓΕΩΡΓΙΟΣ	0,11	ΜΙΛΑΤΟΣ	ΤΣΑΜΠΑΡΛΙ 1	ΕΛΙΑ	ΌΧΙ	Σ
38	11.07	ΛΑΣΙΘΙΩΤΑΚΗΣ	ΓΕΩΡΓΙΟΣ	0,79	ΜΙΛΑΤΟΣ	ΤΣΑΜΠΑΡΛΙ 2	ΕΛΙΑ	ΌΧΙ	Σ
39	12.01	**ΛΑΥΡΕΝΤΑΚΗ**	**ΜΑΡΙΑ**	0,4	ΜΙΛΑΤΟΣ	ΠΑΛΑΙΜΥΛΟ	ΕΛΙΑ	ΌΧΙ	Β
40	12.02	ΛΑΥΡΕΝΤΑΚΗ	ΜΑΡΙΑ	0,27	ΜΙΛΑΤΟΣ	ΒΙΤΣΙΛΙΑΣ	ΕΛΙΑ	ΌΧΙ	Β
41	12.03	ΛΑΥΡΕΝΤΑΚΗ	ΜΑΡΙΑ	0,25	ΜΙΛΑΤΟΣ	ΣΚΟΥΡΟΚΕΦΑΛΟ	ΕΛΙΑ	ΝΑΙ	Β
42	12.04	ΛΑΥΡΕΝΤΑΚΗ	ΜΑΡΙΑ	0,18	ΜΙΛΑΤΟΣ	ΜΑΚΡΥ ΠΕΖΟΥΛΟΙ	ΕΛΙΑ	ΌΧΙ	Β
43	12.05	ΛΑΥΡΕΝΤΑΚΗ	ΜΑΡΙΑ	0,2	ΜΙΛΑΤΟΣ	ΑΜΠΕΛΙΑ	ΕΛΙΑ	ΌΧΙ	Β
44	12.06	ΛΑΥΡΕΝΤΑΚΗ	ΜΑΡΙΑ	0,12	ΜΙΛΑΤΟΣ	ΑΓΚΙΝΑΡΑΣ	ΕΛΙΑ	ΌΧΙ	Β
45	13.01	**ΛΑΥΡΕΝΤΑΚΗΣ**	**ΝΙΚΟΛΑΟΣ**	0,3	ΗΡΑΚΛΕΙΟ	ΣΚΥΛΟΠΛΑΤΑΝΟ	ΕΛΙΑ	ΌΧΙ	Σ
46	13.02	ΛΑΥΡΕΝΤΑΚΗΣ	ΝΙΚΟΛΑΟΣ	0,42	ΗΡΑΚΛΕΙΟ	ΣΕΛΙ	ΕΛΙΑ	ΌΧΙ	Σ
47	13.03	ΛΑΥΡΕΝΤΑΚΗΣ	ΝΙΚΟΛΑΟΣ	0,38	ΗΡΑΚΛΕΙΟ	ΠΕΡΑ ΜΕΡΑ	ΕΛΙΑ	ΌΧΙ	Σ
48	16.02	**ΜΑΝΟΥΣΑΚΗ**	**ΕΥΤΥΧΙΑ**	0,26	ΜΙΛΑΤΟΣ	ΠΡΙΝΟΝΕΡΟ	ΕΛΙΑ	ΌΧΙ	Σ
49	16.03	ΜΑΝΟΥΣΑΚΗ	ΕΥΤΥΧΙΑ	0,19	ΜΙΛΑΤΟΣ	ΑΓΚΑΘΙΑΣ	ΕΛΙΑ	ΝΑΙ	Σ
50	16.04	ΜΑΝΟΥΣΑΚΗ	ΕΥΤΥΧΙΑ	0,12	ΜΙΛΑΤΟΣ	ΜΠΑΜΠΟΥΡΑ	ΕΛΙΑ	ΝΑΙ	Σ
51	17.01	**ΜΑΣΤΟΡΑΚΗ-ΔΙΑΛΥΝΑ**	**ΙΩΑΝΝΑ**	0,31	ΝΕΑΠΟΛΗ	ΦΡΑΡΟ 1	ΕΛΙΑ	ΌΧΙ	Σ
52	17.02	ΜΑΣΤΟΡΑΚΗ-ΔΙΑΛΥΝΑ	ΙΩΑΝΝΑ	0,46	ΝΕΑΠΟΛΗ	ΦΡΑΡΟ 2	ΕΛΙΑ	ΌΧΙ	Σ

ΕΘΕΛΟΝΤΕΣ ΑΓΡΟΤΕΣ ΚΑΙ ΔΙΑΘΕΣΙΜΑ ΑΓΡΟΤΕΜΑΧΙΑ ΣΤΗΝ ΠΙΛΟΤΙΚΗ ΛΕΚΑΝΗ ΧΑΥΓΑ-ΜΙΛΑΤΟΥ, ΤΟΥ ΔΗΜΟΥ ΑΓΙΟΥ ΝΙΚΟΛΑΟΥ									
53	18.02	ΜΑΥΡΙΚΑΚΗ	ΙΝΩ	0,1	ΝΕΑΠΟΛΗ	ΣΚΑΛΕΤΑ	ΕΛΙΑ	ΌΧΙ	Σ
54	22.01	**ΠΑΠΑΜΙΤΣΑΚΗΣ**	**ΜΙΧΑΗΛ**	0,18	ΝΕΑΠΟΛΗ	ΑΡΜΙ	ΕΛΙΑ	ΝΑΙ	Σ
55	22.02	ΠΑΠΑΜΙΤΣΑΚΗΣ	ΜΙΧΑΗΛ	0,29	ΝΕΑΠΟΛΗ	ΛΑΚΚΟΣ ΑΓ. ΓΕΩΡΓΙΟΥ	ΕΛΙΑ	ΌΧΙ	Σ
56	22.03	ΠΑΠΑΜΙΤΣΑΚΗΣ	ΜΙΧΑΗΛ	0,2	ΝΕΑΠΟΛΗ	ΡΙΖΑ	ΕΛΙΑ	ΌΧΙ	Σ
57	23.01	**ΠΑΠΑΤΖΑΝΑΚΗΣ**	**ΓΕΩΡΓΙΟΣ**	0,34	ΝΕΑΠΟΛΗ	ΜΑΡΑΔΙΑΝΑ	ΕΛΙΑ	ΌΧΙ	Σ
58	23.02	ΠΑΠΑΤΖΑΝΑΚΗΣ	ΓΕΩΡΓΙΟΣ	0,2	ΝΕΑΠΟΛΗ	ΚΑΛΑΡΙΤΗΣ	ΕΛΙΑ	ΌΧΙ	Σ
59	27.01	**ΠΕΡΑΚΗΣ**	**ΕΜΜΑΝΟΥΗΛ**	0,1	ΗΡΑΚΛΕΙΟ	ΣΟΧΩΡΑ	ΕΛΙΑ	ΌΧΙ	Σ
60	27.02	ΠΕΡΑΚΗΣ	ΕΜΜΑΝΟΥΗΛ	0,1	ΗΡΑΚΛΕΙΟ	ΚΩΝΣΤΑΝΤΑΚΗ	ΕΛΙΑ	ΌΧΙ	Σ
61	28.02	ΠΕΡΑΚΗΣ	ΔΑΝΙΗΛ	0,21	ΗΡΑΚΛΕΙΟ	ΝΟΤΙΚΑ	ΕΛΙΑ	ΌΧΙ	Σ
62	30.01	**ΣΤΕΦΑΝΑΚΗΣ**	**ΦΑΙΔΩΝ**	0,3	ΛΑΤΣΙΔΑ	ΚΑΜΑΡΙ	ΕΛΙΑ	ΌΧΙ	Σ
63	30.02	ΣΤΕΦΑΝΑΚΗΣ	ΦΑΙΔΩΝ	0,2	ΛΑΤΣΙΔΑ	ΜΑΖΙ 1	ΕΛΙΑ	ΌΧΙ	Σ
64	30.03	ΣΤΕΦΑΝΑΚΗΣ	ΦΑΙΔΩΝ	0,3	ΛΑΤΣΙΔΑ	ΚΑΛΑΡΙΤΗΣ	ΕΛΙΑ	ΝΑΙ	Σ
65	30.04	ΣΤΕΦΑΝΑΚΗΣ	ΦΑΙΔΩΝ	0,3	ΛΑΤΣΙΔΑ	ΜΑΖΙ 2	ΕΛΙΑ	ΌΧΙ	Σ
66	30.05	ΣΤΕΦΑΝΑΚΗΣ	ΦΑΙΔΩΝ	0,1	ΛΑΤΣΙΔΑ	ΞΕΡΑΜΠΕΛΑ	ΕΛΙΑ	ΌΧΙ	Σ
67	31.01	**ΣΥΛΛΙΓΑΡΔΟΣ**	**ΣΠΥΡΟΣ**	0,3	ΛΑΤΣΙΔΑ	ΚΑΤΩ ΛΑΚΚΟΙ	ΕΛΙΑ	ΌΧΙ	Σ
68	31.02	ΣΥΛΛΙΓΑΡΔΟΣ	ΣΠΥΡΟΣ	0,22	ΛΑΤΣΙΔΑ	ΑΝΑΒΛΟΧΟΣ	ΕΛΙΑ	ΌΧΙ	Σ
69	32.01	**ΣΥΛΛΙΓΑΡΔΟΥ**	**ΜΑΡΘΑ**	0,3	ΗΡΑΚΛΕΙΟ	ΚΟΠΡΑΝΟΙ	ΕΛΙΑ	ΌΧΙ	Σ
70	32.02	ΣΥΛΛΙΓΑΡΔΟΥ	ΜΑΡΘΑ	0,15	ΗΡΑΚΛΕΙΟ	ΚΑΤΣΟΠΡΙΝΙ	ΕΛΙΑ	ΌΧΙ	Σ
71	33.02	**ΤΕΡΖΗΣ**	**ΓΕΩΡΓΙΟΣ**	0,4	ΝΕΑΠΟΛΗ	ΠΛΑΤΑΝΙΑ	ΕΛΙΑ	ΌΧΙ	Σ
72	33.03	ΤΕΡΖΗΣ	ΓΕΩΡΓΙΟΣ	0,2	ΝΕΑΠΟΛΗ	ΑΓΚΑΣΤΕΡΑΣ	ΕΛΙΑ	ΝΑΙ	Σ
73	33.04	ΤΕΡΖΗΣ	ΓΕΩΡΓΙΟΣ	0,07	ΝΕΑΠΟΛΗ	ΠΡΙΝΟΝΕΡΟ	ΕΛΙΑ	ΌΧΙ	Σ
74	33.06	ΤΕΡΖΗΣ	ΓΕΩΡΓΙΟΣ	0,07	ΝΕΑΠΟΛΗ	ΨΑ	ΕΛΙΑ	ΌΧΙ	Σ
75	33.07	ΤΕΡΖΗΣ	ΓΕΩΡΓΙΟΣ	0,1	ΝΕΑΠΟΛΗ	ΑΓΙΟΣ ΓΕΩΡΓΙΟΣ	ΕΛΙΑ	ΌΧΙ	Σ
76	34.01	**ΤΖΑΓΚΟΥΡΝΗΣ**	**ΕΛΕΥΘΕΡΙΟΣ**	1,04	ΝΕΑΠΟΛΗ	ΚΑΛΑΡΙΤΗΣ	ΕΛΙΑ	ΝΑΙ	Β
77	35.01	**ΤΖΩΡΤΖΗ**	**ΟΥΡΑΝΙΑ**	0,3	ΝΕΑΠΟΛΗ	ΓΕΡΟ ΚΕΦΑΛΑ	ΕΛΙΑ	ΌΧΙ	Σ
78	35.02	ΤΖΩΡΤΖΗ	ΟΥΡΑΝΙΑ	0,2	ΝΕΑΠΟΛΗ	ΣΚΥΛΟΠΛΑΤΑΝΟ	ΕΛΙΑ	ΌΧΙ	Σ
79	35.03	ΤΖΩΡΤΖΗ	ΟΥΡΑΝΙΑ	0,2	ΝΕΑΠΟΛΗ	ΠΑΝΩ ΤΟΥΛΟΥΠΑΝΑ	ΕΛΙΑ	ΌΧΙ	Σ
80	35.04	ΤΖΩΡΤΖΗ	ΟΥΡΑΝΙΑ	0,2	ΝΕΑΠΟΛΗ	ΔΡΑΚΩΝΑ	ΕΛΙΑ	ΌΧΙ	Σ
81	35.05	ΤΖΩΡΤΖΗ	ΟΥΡΑΝΙΑ	0,8	ΝΕΑΠΟΛΗ	ΠΛΑΤΥΣ ΑΡΜΟΣ 1	ΕΛΙΑ	ΌΧΙ	Σ
82	35.06	ΤΖΩΡΤΖΗ	ΟΥΡΑΝΙΑ	0,78	ΝΕΑΠΟΛΗ	ΠΛΑΤΥΣ ΑΡΜΟΣ 2	ΕΛΙΑ	ΌΧΙ	Σ
83	36.01	**ΦΡΑΓΚΑΚΗΣ**	**ΔΗΜΗΤΡΙΟΣ**	0,8	ΒΟΥΛΙΣΜΕΝΗ	ΑΓΟΡΟΙ	ΕΛΙΑ	ΌΧΙ	Σ
84	36.02	ΦΡΑΓΚΑΚΗΣ	ΔΗΜΗΤΡΙΟΣ	0,2	ΒΟΥΛΙΣΜΕΝΗ	ΚΩΣΤΑΡΑ	ΕΛΙΑ	ΌΧΙ	Σ
85	36.03	ΦΡΑΓΚΑΚΗΣ	ΔΗΜΗΤΡΙΟΣ	0,25	ΒΟΥΛΙΣΜΕΝΗ	ΣΟΧΩΡΑ	ΕΛΙΑ	ΌΧΙ	Σ
86	38.01	**ΧΡΙΣΤΟΦΑΚΗΣ**	**ΙΩΑΝΝΗΣ**	0,5	ΛΑΤΣΙΔΑ	ΣΙΔΕΡΟΥ	ΕΛΙΑ	ΌΧΙ	Σ
87	38.02	ΧΡΙΣΤΟΦΑΚΗΣ	ΙΩΑΝΝΗΣ	0,5	ΛΑΤΣΙΔΑ	ΑΡΧΟΝΤΙΣΣΑ	ΕΛΙΑ	ΌΧΙ	Σ
88	40.01	**ΧΡΟΝΑΚΗΣ**	**ΙΩΑΝΝΗΣ**	0,39	ΝΕΑΠΟΛΗ	ΜΕΡΜΥΓΚΑΣ 1	ΕΛΙΑ	ΌΧΙ	Β
89	40.02	ΧΡΟΝΑΚΗΣ	ΙΩΑΝΝΗΣ	0,39	ΝΕΑΠΟΛΗ	ΜΕΡΜΥΓΚΑΣ 2	ΕΛΙΑ	ΌΧΙ	Β
90	41.01	**ΑΛΕΞΑΚΗΣ**	**ΧΑΡΑΛΑΜΠΟΣ**	0,19	ΑΓΙΟΣ ΝΙΚΟΛΑΟΣ	ΑΓΙΟΣ ΝΙΚΟΛΑΟΣ	ΕΛΙΑ	ΌΧΙ	Σ
91	41.02	ΑΛΕΞΑΚΗΣ	ΧΑΡΑΛΑΜΠΟΣ	0,275	ΑΓΙΟΣ ΝΙΚΟΛΑΟΣ	ΑΓΙΑ ΠΑΡΑΣΚΕΥΗ	ΕΛΙΑ	ΌΧΙ	Σ
92	42.01	**ΣΥΛΛΙΓΑΡΔΟΥ**	**ΜΑΡΙΑ**	0,4	ΛΑΤΣΙΔΑ	ΛΑΓΚΟΣ	ΕΛΙΑ	ΌΧΙ	Σ
93	43.01	**ΜΑΝΟΥΣΑΚΗ**	**ΦΙΛΙΑ**	0,15	ΜΙΛΑΤΟΣ	ΓΚΟΥΡΕΣ	ΕΛΙΑ	ΝΑΙ	Σ
94	43.02	ΜΑΝΟΥΣΑΚΗ	ΦΙΛΙΑ	0,15	ΜΙΛΑΤΟΣ	ΜΑΜΑΚΟΥ	ΕΛΙΑ	ΌΧΙ	Σ
95	43.03	ΜΑΝΟΥΣΑΚΗ	ΦΙΛΙΑ	0,16	ΜΙΛΑΤΟΣ	ΑΡΜΙ	ΕΛΙΑ	ΝΑΙ	Σ
96	43.04	ΜΑΝΟΥΣΑΚΗ	ΦΙΛΙΑ	0,1	ΜΙΛΑΤΟΣ	ΔΡΑΚΩΝΑ	ΕΛΙΑ	ΝΑΙ	Σ
97	43.05	ΜΑΝΟΥΣΑΚΗ	ΦΙΛΙΑ	0,1	ΜΙΛΑΤΟΣ	ΚΑΣΤΕΛΙ 1	ΕΛΙΑ	ΌΧΙ	Σ
98	43.06	ΜΑΝΟΥΣΑΚΗ	ΦΙΛΙΑ	0,1	ΜΙΛΑΤΟΣ	ΔΡΑΚΩΝΙΑ	ΕΛΙΑ	ΌΧΙ	Σ
99	43.07	ΜΑΝΟΥΣΑΚΗ	ΦΙΛΙΑ	0,05	ΜΙΛΑΤΟΣ	ΑΜΠΕΛΙΑ	ΕΛΙΑ	ΌΧΙ	Σ
100	43.08	ΜΑΝΟΥΣΑΚΗ	ΦΙΛΙΑ	0,05	ΜΙΛΑΤΟΣ	ΠΑΛΙΑΛΩΝΟ	ΕΛΙΑ	ΌΧΙ	Σ
101	43.09	ΜΑΝΟΥΣΑΚΗ	ΦΙΛΙΑ	0,07	ΜΙΛΑΤΟΣ	ΚΑΣΤΕΛΙ 2	ΕΛΙΑ	ΌΧΙ	Σ

List of recorded farms in Agri sub-basin

VOLUNTEER FARMERS AND THEIR PARCELS IN THE AGRI PILOT SUB-BASIN, METAPONTINO									
NUMBER OF PARCELS	**PARCEL CODE**	**SURNAME**	**NAME**	**PARCEL'S AREA ha**	**AREA**	**LOCATION**	**CROP**	**IRRIGATED (YES/NO)**	**ORGANIC (O) CONVENTIONAL (C)**
1	1.1	**SABATO**	**ANTONIO**	1,5	AGRI	SCANZANO JONICO	CITRUS	YES	C
2	1.2	SABATO	ANTONIO	1,5	AGRI	SCANZANO JONICO	CITRUS	YES	C
3	1.3	SABATO	ANTONIO	1	AGRI	SCANZANO JONICO	PEACH	YES	C
4	1.4	SABATO	ANTONIO	1	AGRI	SCANZANO JONICO	PEACH	YES	C
5	1.5	SABATO	ANTONIO	0,5	AGRI	SCANZANO JONICO	PEACH	YES	C
6	1.6	SABATO	ANTONIO	0,7	AGRI	SCANZANO JONICO	PEACH	YES	C
7	1.7	SABATO	ANTONIO	1	AGRI	SCANZANO JONICO	PEACH	YES	C
8	1.8	SABATO	ANTONIO	1,5	AGRI	SCANZANO JONICO	PEACH	YES	C
9	1.9	SABATO	ANTONIO	1	AGRI	SCANZANO JONICO	CITRUS	NO	C
10	2.1	**SABATO**	**VITO**	1	AGRI	SCANZANO JONICO	CITRUS	YES	C
11	2.2	SABATO	VITO	1,25	AGRI	SCANZANO JONICO	PEACH	YES	C
12	2.3	SABATO	VITO	1,25	AGRI	SCANZANO JONICO	PEACH	YES	C
13	2.4	SABATO	VITO	1	AGRI	SCANZANO JONICO	PEACH	YES	C
14	2.5	SABATO	VITO	1	AGRI	SCANZANO JONICO	PEACH	YES	C
15	2.6	SABATO	VITO	1,5	AGRI	SCANZANO JONICO	PEACH	YES	C
16	2.7	SABATO	VITO	1,5	AGRI	SCANZANO JONICO	PEACH	NO	C
17	2.8	SABATO	VITO	1,5	AGRI	SCANZANO JONICO	CITRUS	YES	C
18	2.9	SABATO	VITO	1,5	AGRI	SCANZANO JONICO	CITRUS	YES	C
19	3.1	**FORNARO**	**COSIMA**	1	AGRI	SCANZANO JONICO	CITRUS	YES	C
20	3.2	FORNARO	COSIMA	1,5	AGRI	SCANZANO JONICO	PEACH	YES	C
21	4.1	**CECERE**	**SILVIO**	1	AGRI	SCANZANO JONICO	PEACH	YES	C
22	4.2	CECERE	SILVIO	0,4	AGRI	SCANZANO JONICO	PEACH	YES	C
23	4.3	CECERE	SILVIO	0,6	AGRI	SCANZANO JONICO	APRICOT	YES	C
24	4.4	CECERE	SILVIO	1	AGRI	SCANZANO JONICO	PEACH	YES	C
25	4.5	CECERE	SILVIO	1	AGRI	SCANZANO JONICO	APRICOT	YES	C
26	5.1	**TRISTANO**	**ALESSANDRO**	1,3	AGRI	SCANZANO JONICO	APRICOT	YES	C
27	5.2	TRISTANO	ALESSANDRO	1	AGRI	SCANZANO JONICO	APRICOT	YES	C
28	6.1	**NICODEMO**	**FEDERICO**	0,8	AGRI	SCANZANO JONICO	APRICOT	YES	C
29	6.3	NICODEMO	FEDERICO	0,6	AGRI	SCANZANO JONICO	APRICOT	YES	C
30	7.1	**LABRIOLA**	**ANNA LUCIA**	1	AGRI	MONTALBANO JONICO	PEACH	YES	C
31	7.2	LABRIOLA	ANNA LUCIA	1,5	AGRI	MONTALBANO JONICO	APRICOT	YES	C
32	7.3	LABRIOLA	ANNA LUCIA	0,8	AGRI	MONTALBANO JONICO	APRICOT	YES	C
33	8.2	**CORVAGLIA**	**FILIPPO**	0,8	AGRI	SCANZANO JONICO	PEACH	YES	C
34	9.1	**SABATO**	**DONATO ANTONIO**	1	AGRI	SCANZANO JONICO	PEACH	YES	C
35	9.2	SABATO	DONATO ANTONIO	1	AGRI	SCANZANO JONICO	PEACH	YES	C
36	9.3	SABATO	DONATO ANTONIO	1	AGRI	SCANZANO JONICO	APRICOT	YES	C
37	9.4	SABATO	DONATO ANTONIO	1	AGRI	SCANZANO JONICO	APRICOT	YES	C
38	10.1	**CARRINO**	**SALVATORE**	2	AGRI	SCANZANO JONICO	CITRUS	YES	C
39	10.2	CARRINO	SALVATORE	1,3	AGRI	SCANZANO JONICO	CITRUS	YES	C
40	12.1	**RINALDI**	**COSIMA**	1	AGRI	SCANZANO JONICO	PEACH	YES	C
41	12.2	RINALDI	COSIMA	1	AGRI	SCANZANO JONICO	PEACH	YES	C
42	13.1	**ZACCAGNINO**	**SERGIO**	0,8	AGRI	SCANZANO JONICO	PEACH	YES	C
43	13.2	ZACCAGNINO	SERGIO	1	AGRI	SCANZANO JONICO	CITRUS	YES	C
44	14.1	**DORSI**	**GIUSEPPE**	0,8	AGRI	MONTALBANO JONICO	APRICOT	YES	C
45	14.2	DORSI	GIUSEPPE	1	AGRI	MONTALBANO JONICO	PEACH	YES	C
46	14.3	DORSI	GIUSEPPE	1	AGRI	MONTALBANO JONICO	PEACH	YES	C
47	14.4	DORSI	GIUSEPPE	1	AGRI	MONTALBANO JONICO	PEACH	YES	C
48	14.5	DORSI	GIUSEPPE	1	AGRI	MONTALBANO JONICO	PEACH	YES	C
49	14.6	DORSI	GIUSEPPE	0,8	AGRI	MONTALBANO JONICO	PEACH	YES	C
50	14.7	DORSI	GIUSEPPE	0,8	AGRI	MONTALBANO JONICO	APRICOT	YES	C

VOLUNTEER FARMERS AND THEIR PARCELS IN THE AGRI PILOT SUB-BASIN, METAPONTINO									
51	14.8	DORSI	GIUSEPPE	1,2	AGRI	MONTALBANO JONICO	PEACH	YES	C
52	15.1	**FAILLACE**	**FRANCO**	0,9	AGRI	SCANZANO JONICO	CITRUS	YES	C
53	15.2	FAILLACE	FRANCO	1	AGRI	SCANZANO JONICO	CITRUS	YES	C
54	15.3	FAILLACE	FRANCO	1,5	AGRI	SCANZANO JONICO	CITRUS	YES	C
55	15.4	FAILLACE	FRANCO	0,8	AGRI	SCANZANO JONICO	CITRUS	YES	C
56	15.5	FAILLACE	FRANCO	0,8	AGRI	SCANZANO JONICO	PEACH	YES	C
57	16.1	**GRECO**	**ANTONIO**	0,9	AGRI	SCANZANO JONICO	PEACH	YES	C
58	16.2	GRECO	ANTONIO	1,5	AGRI	SCANZANO JONICO	CITRUS	YES	C
59	16.3	GRECO	ANTONIO	1	AGRI	SCANZANO JONICO	CITRUS	YES	C
60	17.1	**LILLO**	**LEONARDO**	1	AGRI	TURSI	PEACH	YES	C
61	17.2	LILLO	LEONARDO	0,5	AGRI	TURSI	PEACH	YES	C
62	17.3	LILLO	LEONARDO	0,5	AGRI	TURSI	PEACH	YES	C
63	17.4	LILLO	LEONARDO	1	AGRI	TURSI	APRICOT	YES	C
64	17.5	LILLO	LEONARDO	1	AGRI	TURSI	PEACH	YES	C
65	17.6	LILLO	LEONARDO	1,5	AGRI	TURSI	PEACH	YES	C
66	17.7	LILLO	LEONARDO	0,5	AGRI	TURSI	PEACH	YES	C
67	17.8	LILLO	LEONARDO	0,5	AGRI	TURSI	APRICOT	YES	C
68	18.1	**VALICENTI**	**GIUSEPPE**	0,5	AGRI	SCANZANO JONICO	APRICOT	YES	C
69	18.2	VALICENTI	GIUSEPPE	0,5	AGRI	SCANZANO JONICO	APRICOT	YES	C
70	18.3	VALICENTI	GIUSEPPE	1,5	AGRI	SCANZANO JONICO	APRICOT	YES	C
71	18.4	VALICENTI	GIUSEPPE	1,5	AGRI	SCANZANO JONICO	APRICOT	YES	C
72	18.5	VALICENTI	GIUSEPPE	1,2	AGRI	SCANZANO JONICO	APRICOT	YES	C
73	18.6	VALICENTI	GIUSEPPE	1	AGRI	SCANZANO JONICO	PEACH	YES	C
74	18.7	VALICENTI	GIUSEPPE	0,8	AGRI	SCANZANO JONICO	CITRUS	YES	C
75	19.1	**DELLI**	**VENERI IMMACOLATA**	2	AGRI	SCANZANO JONICO	PEACH	YES	C
76	19.2	DELLI	VENERI IMMACOLATA	2	AGRI	SCANZANO JONICO	PEACH	YES	C
77	20.1	**SALERNO**	**ANTONIO**	1	AGRI	MONTALBANO JONICO	PEACH	YES	O
78	20.2	SALERNO	ANTONIO	0,2	AGRI	MONTALBANO JONICO	PEACH	YES	O
79	20.3	SALERNO	ANTONIO	0,6	AGRI	MONTALBANO JONICO	PEACH	YES	O
80	20.4	SALERNO	ANTONIO	0,8	AGRI	MONTALBANO JONICO	PEACH	YES	O
81	20.5	SALERNO	ANTONIO	0,8	AGRI	MONTALBANO JONICO	PEACH	YES	O
82	20.6	SALERNO	ANTONIO	0,8	AGRI	MONTALBANO JONICO	PEACH	YES	O
83	20.7	SALERNO	ANTONIO	0,2	AGRI	MONTALBANO JONICO	PEACH	YES	O
84	20.8	SALERNO	ANTONIO	0,8	AGRI	MONTALBANO JONICO	CITRUS	YES	O
85	20.9	SALERNO	ANTONIO	0,6	AGRI	MONTALBANO JONICO	CITRUS	YES	O
86	21.1	**FORTUNATO**	**LEONARDO**	2,38	AGRI	STIGLIANO	OLIVE	YES	O
87	21.2	FORTUNATO	LEONARDO	3	AGRI	STIGLIANO	OLIVE	NO	O
88	22.1	**FORTUNATO**	**GIUSEPPE**	4,78	AGRI	STIGLIANO	OLIVE	YES	O
89	23.1	**RIZZO**	**MATEO**	3,2	AGRI	MONTALBANO JONICO	OLIVE	NO	O
90	23.2	RIZZO	MATEO	7,48	AGRI	MONTALBANO JONICO	OLIVE	YES	O
91	24.1	**TUZIO**	**ANGELO CARMINE**	2,2	AGRI	TURSI	OLIVE	YES	C
92	24.2	TUZIO	ANGELO CARMINE	0,33	AGRI	MONTALBANO JONICO	OLIVE	YES	C
93	25.1	**QUINTO**	**ANGELO**	5,1	AGRI	MONTALBANO JONICO	OLIVE	YES	C
94	26.1	**QUINTO**	**GRAZIO**	59	AGRI	MONTALBANO JONICO	OLIVE	YES	C

VOLUNTEER FARMERS AND THEIR PARCELS IN THE AGRI PILOT SUB-BASIN, METAPONTINO									
95	27.1	**CROCCO**	**ANGELO**	3,3	AGRI	MONTALBANO JONICO	OLIVE	YES	O
96	28.1	**MASTRONARDI**	**PIETRO**	0,8	AGRI	TURSI	OLIVE	YES	O
97	29.1	**MARRESE**	**VITO**	0,8	AGRI	TURSI	OLIVE	NO	C
98	30.1	**BONFIGLIO**	**DONATO**	1	AGRI	MONTALBANO JONICO	OLIVE	YES	O
99	31.1	**BALICE**	**DONATO**	0,9	AGRI	MONTALBANO JONICO	OLIVE	YES	C
100	32.1	**TUZIO**	**MAURIZIO**	1,2	AGRI	MONTALBANO JONICO	OLIVE	YES	C