KICRO

KICRO - Knowledge and Identification of CROP diseases for sustainable food safety

project number 2023-1-PL01-KA220-VET-000157664

Crops and diseases selection Report

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1. INTRODUCTION

The report relates to the **project KICRO - Knowledge and Identification of CROP diseases for sustainable food safety** (project number 2023-1-PL01-KA220-VET-000157664) and is closely linked to Work Package 2: Crops and diseases selection.

The main aim of this report was to obtain a detailed view of the current knowledge and skills of crop diseases in the fruit-growing sector in the countries of the project partners.

In particular, the aim of the report was:

1. to analyse the current skills in crop diseases by the stakeholders (e.g., farmers and packinghouses' staff) in order to better develop effective training material for this target group;

2. to analyse the current needs of the sectors in terms of preferences of crops and diseases;

3. to research on the existing programs and resources related to crop diseases at the countries of partners, that are currently available for the sector.

The report is divided into **two parts**:

PART I:

Needs assessment report on the compiled results of the survey conducted among farmers, packinghouses' staff, other persons working in the fruit industry, plant protection institutes, agricultural development agencies.

PART II:

Research on existing programs and resources related to crop diseases.

2. METHODS

Data collection

Survey questionnaires, prepared by The Polish Farm Advisory and Training Centre after consultation with the other project partners (International Academy of applied Science in Lomza, Poland; Cosvitec Università&Impresa, Italy; The Polish Farm Advisory and Training Centre not-for-profit Sp. z. o o, Poland; Balkan Bridge, Bulgaria; Rezos Brands, Greece; S.E.A.L CYPRUS, Cyprus), were used to prepare the PART I of the report.

Consultations with project partners on the questionnaire took place in October and November 2023.

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Subsequently, in November 2023, the project partners translated the questionnaire into national languages and distributed it to the target group.

The main channel for collecting information was through online completion of the questionnaire by respondents. One partner used direct and telephone contact with respondents.

For the PART II the project partners received in December 2023 an Excel table as a report template from the Polish Farm Advisory and Training Centre (PFA), where, based on a deep search, they were asked to complete the table with existing projects and programmes on existing programs and resources related to crop diseases.

The project partners completed the table in January 2023 and sent it to the WP2 leader: PFA.

Data analysis

For the PART I the project partners received a report template from the Polish Farm Advisory and Training Centre, where they completed the data in English based on the response questionnaires received from the respondents.

For the PART II, the Polish Farm Advisory and Training Centre analysed the data received from the project partners in January 2023 and prepared the PART II report.

3. FINDINGS

PART I:

needs assessment report on the compiled results of the survey conducted among farmers, packinghouses' staff, other persons working in the fruit industry, plant protection institutes, agricultural development agencies

Bulgaria

In Bulgaria, the survey was carried out during mid December 2023 and early January 2024. **18 representatives of the target group** (farmers and packinghouses' staff) took part, out of which 12 were male and 6 female. The majority of them (10 people) were in the age group 36 to 45 years old, followed by the group 25 to 35 (5 people) and under

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25 years old (3 people). In terms of professional profile, 17 people indicated to be farmers, while 1 was staff from packinghouses.

Cyprus

In Cyprus, the survey was carried out during November 2023. **21 people took part**, out of which 18 were male and 3 female. The majority of them (about 38%) was in the age group 36 to 45 years old, followed by the group 46 to 55 (23%) and under 35 years old (23%). In addition, 18 people were farmers, while 3 were staff from packinghouses.

Greece

In Greece the survey was conducted from the 13th to the 30th of November 2023. In the survey for Greece, **20 people participated**, of whom 50% were men and 50% women. 30% of the respondents were under the age of 25, 25% were between 25 and 36 years old, another 25% fell within the age range of 46-55 years, 15% were aged 36-45, and 5% were between 56 and 65 years old. 70% of the respondents were farmers, while the other 30% were packinghouses' staff.

Italy

In Italy the survey was conducted between 10th and 30th November 2023. **25 participants took part** (males: 22, females: 3). Age of participants: under 25 years: 8 persons, 25-35 years: 12 persons, 36-45: 1 person, 46-55: 1 person, 56-65: 3 persons.

Poland

In Poland, the survey was conducted between 13th November and 5th December 2023. **20 participants answered the questionnaire**: 60% man and 40% women, all from Poland: 30% in age between 25-35, 20% in age between 36-45, 20% in age between 46-55, 20% in age over 66, 10% in age between 56-65, 90% of them are farmers, 10% works in a fruit production sector.

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I. FARMING PRACTICES IN THE FRUIT-GROWING SECTOR

Bulgaria

In Bulgaria most of the respondents **(14) own land less than 1 hectare**, followed by those who own **land between 1 and 5 hectares (4). 10** of the respondents work on **peach gardens**, **3 on apples** and the rest **5 declared to cover different sorts such as plums, watermelons and grapes.**

Most popular types of farming practices they apply are **conventional farming practices (16)**, and only **2** persons have pinpointed to use **organic farming practices**. None has voted for sustainable practices.

The majority of the participants **(11) reported that labour shortages** are the biggest challenge they face, followed by **3 who reported the excessive fluctuations** of prices in the market, **3 who declared excessive price fluctuations** and only **1 pinpointing climate change** as the most urgent challenge in the orchard sector.

The most common diseases when it comes to peach trees, grapes, watermelons and plums are shared to be the **bacterial canker on the tree trunk and the bacterial spots on the fruit itself.**

Almost all respondents **(16) exclusively use conventional** techniques so only **2 use organic fertilizers.**

None of the participants has used IPM-based techniques.

Cyprus

In Cyprus, the majority of the participants **(33%) own land between 6 and 15 hectares**, followed by a **24% who own land between 1 and 5 hectares**.

30% of the respondents cultivate or work on **grapes, 30% on apples, 25% on olives**, and the rest on **oranges, lemons, pears and plums**.

95% of the people who participated in the survey **apply conventional farming practices**, and only **5% (1 person) uses sustainable ones**.

The majority of the participants **(57%) reported that climate issues are the biggest challenge they face**, followed by **38% who reported the excessive fluctuations of prices in the market.**

The most common disease when it comes to apples, grapes, pears, oranges and lemons is the **Mediterranean fly**, while when it comes to olives, it is the **bactrocera oleae** (olive fruit fly). Also, **mildew** is common when it comes to grapes. Almost all participants use sprinkling to address the above diseases.

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The vast majority of the respondents **(76%) do not use any organic or sustainable technique**, while **only 19% use organic fertilizers and 14% use bio-fertilizers.**

None of the participants has used IPM-based method.

Greece

In Greece the survey shows that **45% of the respondents own 1-5 hectares of land, 20% own less than 1 ha, 15% own 6-15 hectares, 15% don't own land, and finally, 5% of the participants own over 15 hectares**.

The main types of fruit crops cultivated/worked on by the participants in Greece include **olives, oranges, blueberries, pomegranates, strawberries, watermelon, grapes, cherries, mandarins, tangerines, sea buckthorns, lemons.**

According to the participants, **conventional farming practices still dominate in Greece at 50%**, while **sustainable and organic approaches are also prevalent, each representing 25%**.

The most urgent **challenges** in the orchard sector, Greek participants face are **climate issues, corresponding to 55%,** followed by excessive **price fluctuations (25%)** and **fluctuations in market demand (20%).**

According to the respondents, **the most common diseases affecting fruit crops are those caused by various fungi** (e.g., mycosis, mummy berry, phytophthora, sclerotinia, necrosis of wood, moniliasis, spilocaea oleaginea, septoria, alternariosis, fusariosis, mal secco, bitter rot, corky root rot, cycloconium oleaginum, powdery mildew, mildew), insects (e.g., meligra, olive fly Bactrocera oleae, and other flies), **viruses** (psoriasis), hail, rain, as well as diseases such as gummosis (caused by weather conditions, infections, insects, or mechanical injury) and fruit opening. Fungal diseases are treated through good water management, crop rotation, and healthy fertilization practices, along with maintaining a high level of monitoring and testing. Insect-related diseases, especially those caused by flies, are treated through biological spraying. Fruit opening is addressed through prevention and the use of phytoantiseptics.

Many of the respondents **apply organic or sustainable farming techniques, including the use of organic fertilizers and biofertilizers** (e.g., bacteria or fungi and humic acids to stimulate growth) and the use of irrigation management systems. Other organic or sustainable farming practices employed to a lesser extent by the participants include permanent soil cover, crop rotation, simplified tillage, intercropping, and integrated crop and animal husbandry systems.

According to the survey, 80% of the respondents have never used IPM-based techniques, while only 20% of them have.

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Italy

Regarding how much land the respondents have on average, Italians answered: less than 1 hectare: 0.5 hectares, 1-5 hectares: 3 hectares (average between 1 and 5), 6-15 hectares: 10.5 hectares (average between 6 and 15, more than 15 hectares: 20 hectares (assuming it's greater than 15). **The average of land Italian respondents have is 9 hectares.**

The main types of fruit crop cultivated by Italian farmers are **olives**: 11 respondents, **citrus fruits**, **cherries**, **grapes**: 5 respondents for each, **almonds**: 3 respondents, **stone fruits**: 2 respondents, **peaches**: 2 respondents, **kiwi, apples, cucurbitaceae, hazelnuts, pistachio, strawberries:** 1 respondent for each.

The most popular types of farming practices they apply are **organic, sustainable and conventional.**

The most common diseases that affect fruit crops in Italy are **bactrocera oleae, powdery mildew, downy mildew, phoma tracheiphila, mite, botrytis cinerea, aphid, scale insect.**

Regarding organic or sustainable farming techniques, Italians apply to support soil and environmental health mostly **sustainable irrigation management system, permanent soil cover, non-chemical fertilizers, low tillage** and other (mulching, localized fertigation, crop rotation, grafting of our horticultural crops, protected cultivation)

14 of 25 Italian respondents indicate that they use IPM-based techniques.

Poland

65% of Polish respondents have 1-5 h of land, 15% have 6-15 h and 15% - less than 1 h and 1% over 15 h.

The main type of fruit crop Polish farmers cultivate are (**45% of respondents) apples**. Than they cultivate also **20% - strawberries, 15% - cherry**, other (less than 10%) – **blueberry, pears, raspberries**.

80% of Polish respondents practice **traditional farming** and **20% organic farming**.

The most urgent **challenges** in the orchard sector are **climate changes (50% of respondents), excessive price fluctuations (30% of respondents), fluctuations in market demand (15% of respondents) and labour shortages (5% of respondents).**

The most common diseases that affect fruit crops in Poland are **apple scab, plague, plum pox, leukostomosis, fungal diseases, pests, white or red spotting, bitter rot, gray mold, strawberry anthractose, shoot blight, powdery mildew, shoot dieback.**

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They use mostly spraying with fungicides, planting with resistant varieties to avoid these diseases.

55% of Polish farmers do not use organic or sustainable techniques, 30% use organic fertilizer, 25% use Irrigation management system, 20% use crop rotation, 15% use intercropping and 5% provide permanent soil cover.

90% of Polish respondents don't use IPM, 10% use IPM- based techniques.

II. TRAINING AND SUPPORT PROGRAMMES IN THE FRUIT-GROWING SECTOR

Bulgaria

In Bulgaria all participants shared the opinion that the availability of skilled labour for cultivation and harvesting work in orchard sector is either difficult to find or there is access to unskilled labour only, **11 and 7 votes respectively.**

Almost all of the participants would like to receive training or advice on crop disease control, **15 answered 'yes' and 3 'no'.**

Regarding the time dedicated to the training training and updating their knowledge of orcharding per year, slight majority of the participants **do not receive training - 9**, **6 of them do for less than 20 hours per year**, and there are **3 who declared to participate between 21 and 50 hours.**

The most popular resources or training opportunities that respondents would like to have available to improve their knowledge and skills on crop diseases control in the orchard sector are: some participants **(5) would like to be trained on agrotechnical and physical methods** of orchard plant protection. **5 on fruit plant protection products**, **(8) support programmes for farmers in the fruit-growing sector.**

No participant has indicated to be involved in projects/initiatives/trainings in regards to crop protection, crop diseases control in the orchard sector.

Only a few participants **(5) has indicated to be aware of support programs** in the context of the orchard sector. These programs are: The Common Agricultural Policy (CAP) - 2 respondents, National subsidies for agriculture - 3 respondents.

Awareness of the respondents of any national or European programs to support the orchard sector, particularly in relation to plant protection, crop disease control could be considered critically low as **only 2 participants declared to be aware of The Common Agricultural Policy (CAP).**

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Cyprus

In Cyprus, **the majority of the participants (57%) thinks that skilled labour force is difficult to find**, while the rest **43% believes that there is access to unskilled labour force only**.

95% of the participants would like to receive training or advice on crop disease control.

The majority of the participants **(57%) receive training, but for less than 20 hours per year**, followed by 28% who doesn't receive any training at all.

Most participants **(43%) would like to be trained on biological and microbiological methods for the protection of orchard plants, followed by 24% who prefers agrotechnical and physical methods of orchard plant protection**.

Only 19% of the participants are involved in projects in regards to crop protection, crop diseases control in the orchard sector and only 33% are informed about support programs.

40% are aware of national or European programs to support the orchard sector, particularly in relation to plant protection, crop disease control.

It is a common belief among the participants that the **application process is difficult and time-consuming**, while the result is uncertain.

Greece

In Greece, **65% of the respondents rate the availability of skilled labour for cultivation and harvesting work in the orchard sector as difficult**. Another 25% rate access to only unskilled labour, while a lower percentage, corresponding to 10%, rate the availability of skilled labour as good and easy.

100% of Greek respondents would like to receive specialist training or advice on crop disease control.

According to the Greek respondents, 50% of them do not take part in any training, 35% receive training (less than 20 hours per year) and 15% participate in training (between 21 and 50 hours per year).

Regarding the resources and training opportunities, respondents would mostly like to improve their knowledge on biological and microbiological methods for the protection of orchard plants (30%) as well as support programmes for farmers in the fruit-growing sector (30%). Agrotechnical and physical methods of orchard plant protection and epidemiology of fruit plant diseases are also popular choices among the respondents (20%). The least popular choice of the respondents is the use of plant protection products.

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Based on the survey, **70% of the participants are not involved in projects** aimed at crop protection, crop disease control in the orchard sector. On the other hand, 30% of the participants are involved in such projects.

A significant percentage of respondents, corresponding to a **65%, are not familiar with/up to date with the support programs** (including input purchase of inputs) in the context of the orchard sector. Only 35% of them are aware of such support programs.

According to the respondents, 65% of them are not aware of any national or European programs to support the orchard sector, especially in relation to plant protection, crop disease control. However, a lower percentage of the respondents, corresponding to 35%, is aware. The main **challenges** respondents face in the application process for programs/fundings that help manage the fruit growing sector are **bureaucratic issues**, including the submission of several and difficult supporting documents. These challenges also encompass the complexity of the required processes, competition for resources, and the necessity to comply with regulations and specifications. Furthermore, respondents find it challenging to explain IT-based concepts related to disease prevention. **Lack of information about available funding opportunities** can also be a challenge for respondents.

Italy

Only 2 from 25 Italian respondents rate the availability of skilled labour for cultivation and harvesting work in orchard sector as good, easy available.

68% of respondents would like to receive specialist training or advice on crop disease control.

Italian farmers **on average spend 23 hours per year on training** and updating their knowledge of orcharding.

The most popular resources or training opportunities that respondents would like to have available to improve their knowledge and skills on crop diseases control in the orchard sector are support programmes for farmers in the fruit-growing sector, fruit plant protection products and biological and microbiological methods for the protection of orchard plants.

80% of Italian respondents is not involved in crop protection, crop diseases control in the orchard sector projects.

72% of respondents is not familiar with information on support programs (including purchase of inputs) in the context of the orchard sector.

72% is not aware of national or European programs to support the orchard sector, particularly in relation to plant protection, crop disease control.

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The biggest **challenges** of the application process for programs/fundings that help to manage fruit growing sector are: **unclear calls, excessive bureaucracy, little support for young people, excessive limitation**.

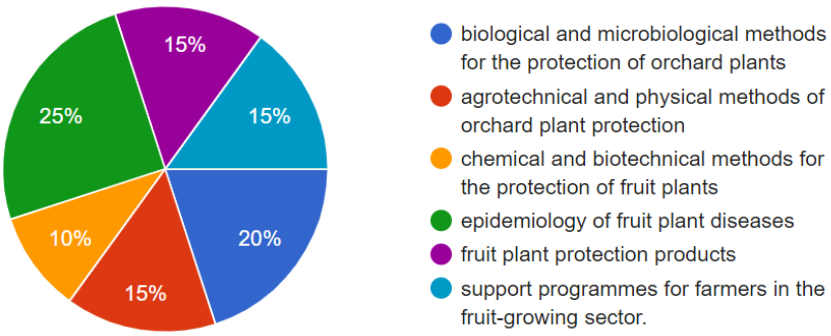
Poland

85% of respondents finds difficult availability of skilled labour for cultivation and harvesting work in orchard sector and15% of respondents responded that they have access to unskilled labour only.

95% of Polish respondents would like to receive specialist training or advice on crop disease control, when 5% won't receive specialist training or advice.

55% of respondents don't take part in any training in orcharding. 40% of respondents receive training (less than 20 hours per year). 5% of respondents participate in training (between 21 and 50 hours per year).

Below we can see the most popular resources or training opportunities that Polish respondents would like to have available to improve their knowledge and skills on crop diseases control in the orchard sector:



90% of respondents aren't currently involved in any projects aimed at crop protection, crop disease control in the orchard sector and only 10% are currently involved in projects related to crop protection, crop disease control in the orchard sector.

100% of respondents is not up to date with the availability of information on support programmes (including purchase of inputs) in the context of the orchard sector.

70% of respondents are not aware of any national or European programs to support the orchard sector, particularly in relation to plant protection, crop disease control

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30% of respondents is aware.

The most common **challenges** for Polish farmers are **needs of own contribution, no information about financing possibilities, too much paperwork and bureaucracy, too complicated, application procedure, lack of professional advice, complicated procedures, information chaos, not knowing where to find information about programs**.

III. ECONOMY ASPECTS OF THE FRUIT-GROWING SECTOR

Bulgaria

The approximate percentage of crop losses in farms in Bulgaria during and after harvest:

7 respondents reported a loss of **5 to 20%, 4** reported loss of less than 5% , **3** reported loss of 21% to 35%, **2** people reported loss of 51% to 70%, **1** person reported 71% to 90% and **1** - more than 90%.

The main factor causing crop losses during and after harvest are: **6** respondents shared that main factor is microbial infestation, **5** shared that main factor is harvesting methods, **3** of them shared that main factor is market demand **2** people shared that main factor is methods of transport and also **2** indicated that main factor is low level of knowledge and awareness in the respective environment.

Almost **all** participants mentioned **affordable pesticides (organic)** and **5 more indicated trainings as** preventive measures or strategies are applied to minimize the risk of loss fruit crops.

Regarding economic losses due to fruit diseases in the last 3 years **11** have had a loss **between 11 and 30%**, while **7** have experienced a **loss of up to 10%**.

In Bulgaria, the survey was carried out during mid December 2023 and early January 2024. 18 respondents shared concerning facts about their experience within the orchard sector.

Majority of the people who participated apply conventional farming practices (16), and only 2 persons have pinpointed to use organic farming practices. None has voted for sustainable practices.

None of the participants has used IPM.

Awareness of the respondents could be considered critically low as only 2 participants declared to be aware of The Common Agricultural Policy (CAP).

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Majority of the participants do not receive training - 9, 6 of them do for less than 20 hours per year, and there are 3 who declared to participate between 21 and 50 hours.

As a conclusion: The KICRO target group in Bulgaria has not participated regularly in training on crop diseases identification and they are willing to as there is a lack of supportive initiatives/projects/training.

Cyprus

In Cyprus, **62% of the people reported a loss of crop losses in farms during and after harvest**, 5 to 20%, followed by the loss of less than 5% for 29% of the people.

52% of the participants reported the weather conditions, followed by 43% who reported microbial infestation as the main factor causing crop losses during and after harvest.

As **preventive measures** or strategies are applied to minimize the risk of loss fruit crops, **all participants mentioned sprinkling and 30% also pruning**.

47% have had an economic loss due to fruit diseases in the last 3 years between 11 and 30%, while 38% have experienced a loss of up to 10%.

In the survey that was carried out in Cyprus during November 2023, 21 people took part, the majority of which were male farmers between 36 and 45 years old, who own land between 6 and 15 hectares.

The most common fruit cultivated are grapes, apples and olives and the most common practice is the conventional one. Their crops are mostly affected by climate conditions, while the most common diseases are the Mediterranean fly, the bactrocera oleae (olive fruit fly) and the mildew. Almost all participants use sprinkling to address the above diseases.

The majority of the respondents do not use any organic or sustainable technique, and none of them has ever used IPM.

Almost all have difficulties in finding skilled labour force, and all of them are open to training and advice, with the most prominent topic being biological and microbiological methods for the protection of orchard plants.

Two thirds of them receive some kind of training, but for less than 20 hours per year, and less than half of them are aware of existing programs or projects or involved in them. Most participants have recently had a crop loss of 5 to 20% due to weather conditions, and all of them use sprinkling and pruning to deal with that. Finally, most of them have had a financial loss of 11 to 30%.

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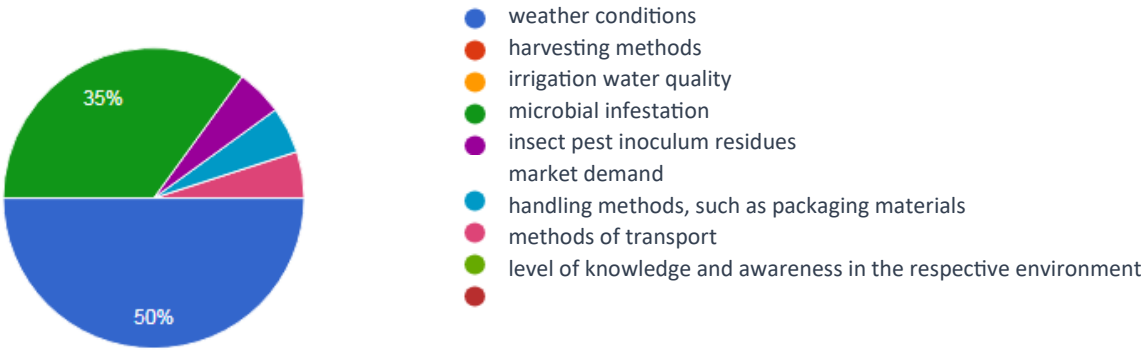
Greece

Based on the survey, most of the Greek respondents **(75%) have about 5-20% crop losses in their farm during and after harvest**. A lower percentage of the respondents, corresponding to 20%, has crop losses of 21-35%.

According to the results, the **main factors causing crop losses** during and after harvest are the **weather conditions with a percentage of 50%, following by the microbial infestation with a percentage of 35%.** Other factors causing crop losses include the handling methods such as packaging materials and the level of knowledge and awareness in the respective environment.



The measures or strategies applied to minimize the risk of loss fruit crops in Greece are:

- Preventive measures to control diseases caused by harmful insects, fungi, etc.
- Preventive spraying of crops using biological plant protection products and approved copper fungicides.
- Using biological plant protection products and employing targeted use of pesticides.
- Implementing best agricultural practices for cultivation, including the use of natural, organic and biological fertilizers, as well as organic methods of plant protection.
- Systematic control, inspections and monitoring.
- Strengthened canopies and greenhouses.
- Use of cameras and sensors.
- Water management and precision agriculture.
- Creation of natural or artificial windbreaks for protection from gusty winds and cold.

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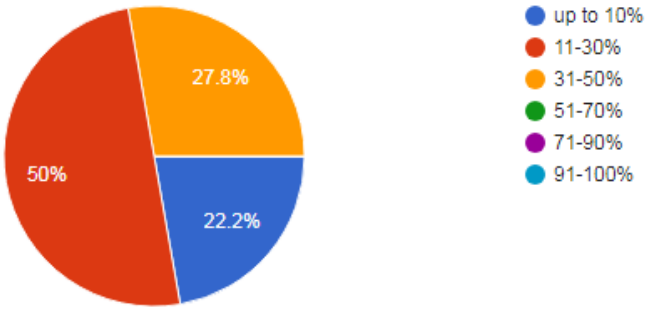
- Providing cover from excessive sun, anti-corrosion and anti-freeze measures, and use of heated constructions.
- Renewal of mechanical equipment.
- Removal of dry branches along with a section of a healthy shoot of about 15 cm, and its destruction by fire.
- Uprooting and burning of trees damaged by disease.

90% of the respondents have undergone economic losses due to fruit diseases in the last 3 years, while only 10% of them did not suffer from economic losses.

Specifically, 50% of the respondents experienced economic losses ranging from 11% to 30% due to fruit diseases in the last 3 years. During the same period, 27.8% of the participants faced economic losses between 31% and 50%, while 22.22% had losses of up to 10%.



The KICRO project survey conducted from November 13th to 30th, 2023, involved 20 Greek participants, with a gender distribution of 50% men, and 50% women.

Key demographics revealed diverse age groups and occupational backgrounds, with 70% being farmers and 30% working in packinghouses. The survey highlighted significant land ownership patterns, with 45% owning 1-5 hectares, 20% owning less than 1 ha, and 15% each for 6-15 hectares and those not owning land.

The predominant fruit crops cultivated included olives, oranges, blueberries, pomegranates, strawberries, watermelon, grapes, cherries, mandarins, tangerines, sea buckthorns, and lemons.

Farming practices indicated a prevalence of conventional methods (50%), alongside the adoption of sustainable (25%) and organic (25%) practices. Urgent challenges identified included 55% climate issues, 25% excessive price fluctuations, and 20% fluctuations in market demand. Common fruit crop diseases, caused by fungi, insects and viruses, were addressed with treatment strategies focusing on good water management, crop rotation, heathy fertilization practices and biological spraying.

Insights into participants' practices revealed that 20% utilized IPM-based techniques. Skill labour availability for orchard work posed difficulties for 65%, with 25% having access only to unskilled labour, and 10% founding skilled labour readily available. Notably, all

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respondents expressed interest in specialist training or advice on crop disease control. In terms of awareness, 50% did not participate in any training, 35% received less than 20 hours of training annually, and 15% participated in 21-50 hours. Preferences for resources leaned towards biological and microbiological methods for the protection of orchard plants (30%) and support programs for farmers in the fruit-growing sector (30%). Survey results indicated that 70% were not involved in projects for crop protection, while 30% were.

A significant portion (65%) lacked awareness of support programs including national or European, with only 35% being aware. Challenges in applying for programs/funding included bureaucratic issues, competition for resources, and difficulty explaining IT-based concepts. Lack of information on funding opportunities was also noted.

Regarding crop losses, 75% experienced losses of 5-20%, and 20% had losses of 21-35%. Primary factors were weather conditions (50%) and microbial infestation (35%). The measures/ strategies applied to minimize the risk of fruit losses mostly included preventive measures, biological plant protection, targeted use of pesticides, best agricultural practices, systematic control, inspections, monitoring and more. Economically, 90% of the participants suffered losses due to fruit diseases in the last 3 years, with 50% experiencing losses of 11-30%, 27.8% with losses of 31-50%, and 22.22% with losses up to 10%.

Italy

The **average of crop losses** in Italian farms during and after harvest is **about 13%**.

The main factors causing crop losses during and after harvest are: **weather conditions**: 14 respondents, market demand: 4 respondents, harvesting methods: 3 respondents, microbial infestation: 2 respondents, level of knowledge and awareness in the respective environment: 1 respondent.

Italian farmers the most often apply below preventive measures or strategies to minimize the risk of loss fruit crops: agronomic methods (scalability of production and early harvesting), monitoring, hail nets, chemical treatments, mechanized harvesting, cold storage.

60 % of Italian respondents said that they **faced economic losses** due to fruit diseases in the last 3 years. The average of losses is 30%.

Farmers surveyed operate in different age groups and manage various crops, ranging from olive groves to orchards of apples, citrus fruits, cherries, and more. Analyzing the provided data reveals some common trends:

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The majority of farmers adopt sustainable or organic practices, highlighting a growing environmental awareness in the agricultural sector.

The size of farms varies, with a prevalence of small to medium-sized areas (1-15 hectares).

Common challenges include price fluctuations, climatic issues, a shortage of labor, and the presence of specific pests and diseases for each crop.

The use of non-chemical fertilizers, biological and microbiological treatments, as well as the implementation of sustainable irrigation management systems, are common practices among respondents.

Some farmers participate in support programs, but bureaucracy and the complexity of calls for proposals emerge as significant challenges.

Slow bureaucracy, difficulty in obtaining funding, and the complexity of calls for proposals are common issues.

Farmers highlight the need for more clarity in calls for proposals and support for small businesses. Additionally, access to state-of-the-art technologies is indicated as a potential improvement.

Each respondent faces specific challenges related to their crops, demonstrating the diversity of approaches necessary to manage the unique characteristics of each agricultural sector.

Overall, sustainable agriculture emerges as a priority, but economic and bureaucratic challenges require increased support and simplification to promote the growth and sustainability of agricultural enterprises.

Poland

The approximate percentage of **crop losses in Polish farms** during and after harvest: **65% of respondents - 5-20%, 20% - less than 5 % and 15% - 21-35%.**

The main factor causing crop losses during and after harvest in Poland:
40% - microbial infestation
40% - weather conditions
20% - harvesting methods, level of knowledge and awareness in the respective environment, market demand.

The most common preventive measures or strategies are applied to minimize the risk of loss fruit crops, irrigation, fertilization, plant protection products

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Fungicides, ecological plant protection products, right time and quick harvest, appropriate harvesting method and plant irrigation, care treatments, bush sprinkler system, mechanically remove diseased shoots, protection against animals, protection against pests, a fungicide intended to combat bitter rot preventively and emergency chemical fungicidal plant protection products.

100% of Polish respondents had economic losses due to fruit diseases in the last 3 years where 70% had losses between 11 and 30% and 30% had losses less than 10%.

In the survey "needs assessment report on the compiled results of the survey conducted among farmers, packinghouses' staff, other persons working in the fruit industry, plant protection institutes, agricultural development agencies" 20 participants answered the questionnaire: 60% man and 40% women, all from Poland. The survey was conducted between 13 November and 5 December 2023 online.

Most respondents were farmers aged between 25-35. 90% of them are farmers, 10% works in a fruit production sector. 65% of respondents have 1-5 h of land.
The most popular fruit grown by respondents are apples (45%). Most of the Polish farmers use method of traditional farming (80%) and only 20% organic one.

85% of respondents have difficulty to find skilled labour for cultivation and harvesting work in orchard sector. 95% of respondents would like to receive specialist training or advice on crop disease control and also 90% of respondents aren't currently involved in any projects aimed at crop protection, crop disease control in the orchard sector. What is more, 100% of respondents aren't up to date with the availability of information on support programmes in the context of the orchard sector.

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PART II:

Research on existing programs and resources related to crop diseases.

Research on existing programmes and resources related to crop diseases was carried out in the project partner countries.

A report template format was used to collect data (the template can be found at the end of the report under the Appendix section).

Based on the research, the project partners identified a variety of existing projects, programmes and training related to crop diseases, depending on the country.

Bulgaria

In Bulgaria there are currently a total of **5 initiatives on crops deseases**. **4 of them are non-formal and only 1 - formal**, 2 of them are projects and 3 are trainings.

The programmes in Bulgaria are mainly dedicated to farmers, packinghouses staff, production/storage/distribution staff, plant protection institutes, agricultural development agencies and agroecologist.

Courses typically last between 30 and 150 hours, with projects lasting up to three years.

Type of training	Title of training program in English	Sector/institution that organizes the training (Provider organization)	Level of course/project	Thematic area
non-formal	Project „Fostering plant biodiversity research capacity in Bulgaria through scientific excellence in DNA barcoding and metabarcoding“	the Ministry of Education and Science of Bulgaria	national programe	The ultimate objective of the BULCode project is to enhance the knowledge and technical capacity of the IPPG and its Bulgarian partner IBER in DNA barcoding technologies and their use for assessment and cataloguing of Bulgarian plant biodiversity, studying ecology dynamics and taxonomic identification of plant species.
non-formal	Project "MelaTriS"	the Ministry of Education and Science	national programe	Among the environmental factors directly leading to significant economic losses, drought occupies a dominant share. Wheat is among the most important crops for mankind, and although it tolerates drought to a certain extent, prolonged water deficit causes a number of unfavorable changes in plants and leads to a significant decrease in their productivity. As a result of deepening climate changes, the use of ecological biostimulators as an innovative approach to reduce the harmful effects of drought is gaining more and more popularity in modern plant breeding practice.
formal	Training in "Organic Agriculture"	CENTER FOR PROFESSIONAL TRAINING at "ZENIT 94" Ltd	local program	The training in "Organic Agriculture" is for all farmers applying under Measure 11 "Organic Agriculture" of the Program for the Development of Rural Areas.

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non-formal	Training for farmers	Professional training center at EURO-ALLIANCE OOD	local program	
non-formal	Training "Academy of Agricultural Education and Science"	Academy "Agricultural Education and Science"	local program	AGRICULTURAL EDUCATION AND SCIENCE ACADEMY was established with the aim of helping all Bulgarian farmers and specialists to increase their knowledge, skills and professional experience in the overall implementation of their agricultural production - from all-round care in the cultivation of agricultural crops, preservation of soil health and fertility, to the successful resolution of current economic, organizational and institutional problems of agrarian business.

Cyprus

There are currently **10 crop deseases initiatives** in Cyprus, all of which are **non-formal**. Each activity has **project** status, with 6 project offering also **face to face or online training**. These initiatives typically last from 2 to 5 years.

The projects are mainly dedicated to farmers, people from both the public and private sector (control bodies, FBOs, NGOs, municipalities, consumers) and raises awareness on food safety risks, risk prevention, and animal health, as well as to young NEETs.

Training courses typically cover: Organic Farming, Sustainable Food Processing, Aquaponics, Hydroponics, Soft Employment Skills, Planning, organisation, and implementation of controls, Food safety risk assessment and response to emergencies, Feed hygiene requirements and feed risk assessment, Financing the costs of controls along the food chain, Implementation of good hygiene practices and haccp-based own checks at fbo level, Microbiological and residues methods for laboratory staff, Record keeping, labelling, traceability, Requirements for import and trade of animal products in the EU, Food safety data management.

Type of training	Title of training program in English	Sector/institution that organizes the training (Provider organization)	Level of course/project/	Thematic
Non-formal	ADAPT2CLIMA - Adaptation to Climate change Impacts on the Mediterranean islands' Agriculture	Agricultural Research Institute - ARI, Cyprus	The project is co-financed by the LIFE programme for the Environment and Climate Action (2014-2020).	The impacts of climate change on crop performance, water availability and the agricultural sector in general are presented through interactive visualization maps and graphs by means of the ADAPT2CLIMA tool, which may be used for exploring the available adaptation options for addressing climate change impacts and their efficiency in increasing the resilience of agriculture.

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Non-formal	Data-Driven Potato Production (IoT4Potato) - IoF2020	Agricultural Research Institute - ARI, Cyprus	IoF2020 is part of Horizon 2020 Industrial Leadership and supported by the European Commission.	The project uses a network of IoT telemetry stations installed in potato cultivations, with the purpose of collecting atmospheric and soil data automatically, which are combined with satellite data, as well as with information relating to the cultivating tasks that the farmers themselves provide. The results feed the validation of an innovative business plan, specially designed for SMEs (Small- and Medium-sized Enterprises) and small scale producers, which is based on sharing the profits that stem from the cost reduction and the sale of the data to third-parties, while the farmers retain the control of their data.
Non-formal	ORGANIKO LIFE+ Revamping organic farming and its products in the context of climate change mitigation strategies	Cyprus University of Technology	The project is co-financed by the European Union in the framework of the LIFE Programme.	The aim is to develop a strategic national plan of mitigating climate change in agriculture through the advancement of organic farming and their products within the Cypriot economy.
Non-formal	GeneBEcon	XPRO Consulting Limited	GeneBEcon has been funded under the Horizon Europe programme destination 'Clean environment and zero pollution'	The project focuses on circular bio-based systems in industrial sectors along value chains and supply chains of biological feedstock.
Non-formal	EU Food Safety Project	NSF Euro Consultants	The "EU Food Safety Project" "Technical assistance to improve implementation of food safety standards and disease crisis preparedness" is funded under EU Aid Programme for the Turkish Cypriot community.	The aim is to achieve improved food safety, public health, animal health, and protection of the environment, and to mitigate the impact of potential exotic animal diseases, in particular those posing imminent threats.
Non-formal	LIFE – FOODPRINT	DIAS Publishing House Ltd	The project is co-funded by the LIFE Programme of the European Union.	The project will encourage the adoption of sustainable practices in the food and hospitality industries of Cyprus as well as among consumers to have a direct or indirect environmental and economic impact.
Non-formal	CLUSTER ENI CBC Med project	Cyprus Chamber of Commerce and Industry (CCCI)	The CLUSTER project is co-funded by the European Union under the cross-border ENI CBC Mediterranean Basin program.	Within the framework of the CLUSTER project, the CCCI will provide free training, mentoring and guidance
Non-formal	FOOD-Y	SEAL CYPRUS	The project is an Erasmus+ Key Action 2, Strategic Partnership in Youth	The project aims to re-engage young NEET in solving issues in their communities, connected to food and its waste. The aim is to ensure they have the life skills and knowledge to foster their ability to overcome barriers to participation, employment and transition to adulthood.
Non-formal	LIFE – AgrOassis: Regenerative approaches for building climate change resilience in EU agricultural	LAONA Foundation	The project is co-funded by the LIFE Programme of the European Union.	The project will contribute towards climate change mitigation, promote carbon farming and biodiversity restoration. The latter will be achieved by promoting effective re-growth of trees and shrubs in degraded field margins and by aiding pollination processes, in regions of poor soil quality and very low natural vegetation cover.

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	regions prone to desertification			
Non-formal	3PRO-TROODOS, Proactive Producer and Processor Networks for Troodos Mountains Agriculture	The Cyprus Institute	3PRO-TROODOS research project is an Integrated Research Project, co-funded by the European Regional Development Fund and the Republic of Cyprus through the Research and Innovation Foundation.	The project aims to improve agricultural production and food processing in the Troodos Mountains of Cyprus, through social innovation, sustainable natural resource management and climate change adaptation.

Greece

In Greece, there are **11 programmes** on crop deseases in orcharding. **10 of them are non-formal and 1 formal**.

Most of the activities are **projects**, but 1 is dedicated strictly to **training seminars** (Institute of Agricultural Sciences (IGE) activities).

Projects are mainly organised for farmers, Youth in the Greek Agrifood sector, SMEs and midcaps, professional farmers, public organisations, consumers. International Hellenic University (IHU) wish to acquire expertise in sustainable agriculture and agribusiness so the programme is dedicated also to the professionals who wish to establish start-up agricultural companies that bring new ideas to both farming and the market as well as to professionals who work in the private/public agricultural/agribusiness sectors and wish to redirect their careers or enhance their existing capabilities.

The length of projects depends on their specific characteristics, but among the activities for the fruit-growing sector in Greece there are initiatives lasting up to 4 years.

8 of the 11 initiatives are funded or co-financed by the European Union.

Type of training	Title of training program in English	Sector/institution that organizes the training (Provider organization)	Level of course/project	Thematic area
non-formal	INNO-4-AGRIFOOD | Capitalising the full potential of on-line collaboration for SMEs innovation support in the Agri-Food ecosystem	Q-Plan	This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 681482	All relevant information about the agri-food industry, such as current trends, relevant and state of the art technologies, innovative and practical solutions as well as funding opportunities
non-formal	DigiAgriFood EDIH | Digital Transformation and Green Transition of the Agri-Food Value Chain in Central and Northern Greece	Democritus University of Thrace	Co-funded by the EU	Artificial Intelligence technologies, Advanced Digital Skills, High Performance Computing and Digital Transformation and Interoperability

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non-formal	New Agriculture New Generation	Founding Donor : Stavros Niarchos Foundation (SNF) Colloboration with Agricultural University of Athens and the American Farm School of Thessaloniki	New Agriculture New Generation was established with the initiative and donation of the Stavros Niarchos Foundation (SNF) within the framework of the Recharging the Youth program in 2018.	Workforce development, Enterpreneurship Innovation, Strategic iniatives - to provide training opportunities to young people so they can develop or even re-new their knowledge and skills that will help them work in the agrifood sector and continue to be competitive.
non-formal	Source | Boosting SOcial and Organic farming for inclUsive and sustainable gRowing eConomiEs	CO: AGRIFORM (Italy) Greek partner: NEAGEN	co-funded by the EU	Social farming and organic farming
non-formal	Fruit Flies in-silico Prevention and Management	University of Thessaly	Funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 81818	Protection of fruit production Trade threats posed by fruit flies
non-formal	OPTIMA | Optimised Pest Integrated Management to precisely detect and control plant diseases in perennial crops and open-field vegetables	AUA	Funding from the European Union's Horizon Research and Innovation Programme under grant agreement No 773718	Optimised Pest Integrated Management to precisely detect and control plant diseases in perennial crops and open-field vegetables - IPM framework for vineyards, apple orchards and carrots
non-formal	"Superpests" Innovative tools for rational control of the most difficult-to-manage pests (super pests) and the diseases they transmit	AUA	This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 773902	Effective and sustainable Integrated Pest Management (IPM) of the "super pests"
non-formal	EDUCATIONAL PROGRAMS OF I.G.E	Institute of Agricultural Sciences (IGE)	Training seminars	Arboriculture
formal	MSc in Sustainable Agriculture and Business	International Hellenic University (IHU)	MSc in Sustainable Agriculture and Business	Soil Management for Sustainable Agriculture Agri and BioProduct Finance Integrated Pest Management Soil Microbial Inoculants and Biostimulants for Sustainable Crop Production Integrated Disease Management Greenhouse Management

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non-formal	AgriFood4Future	CO - Università Cattolica del Sacro Cuore - UCSC (Italy) Partners from Greece: AKMI (Greece) AGENSO (Greece) ELGO-DIMITRA (Greece)	ERASMUS-EDU-2022-PEX-COVE (Partnership for Excellence - Centres of Vocational Excellence)	Intelligent agriculture and sustainable food systems
non-formal	SmartProtect | SMART agriculture for innovative vegetable crop PROTECTion: harnessing advanced methodologies and technologies	CO: INAGRO, PROVINCIAAL EXTERN VERZELFSTANDIGD AGENTSCHAP IN PRIVAATRECHTELIJKE VORM VZW Greek Participant: AGRICULTURAL & ENVIRONMENTAL SOLUTIONS	This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 862563	Vegetable crops

Italy

Regarding existing programmes and resources related to crop diseases in Italy, we have **5 initiatives, of which 2 are strictly formal**.

2 projects were funded by the European Commission and are classified as **international programmes**. **One project is local**, organised by the ITS Academy Territorio del Lavoro.

As far as the target group is concerned, these are mainly young people (including NEETs) and government officials, staff members working in EU Institutions, other stakeholders.

The thematic scope of the projects is mainly concerned with working on the food production process, managing the procurement process of raw materials and resources, designing the cultivation plant, monitoring business processes / results, in accordance with current protocols and legislation, managing the certification system and product traceability, preparing the quality control plan, applying remote sensing tools and technologies, analysing industrial automation components and robotic systems procedures, applying regenerative agriculture instruments and techniques, protecting consumers in the EU market and providing guarantees for food from non-EU countries. Control and calibration of pesticide application equipment. The project also addresses pesticide risk assessment and management, specific tools, techniques and practices to reduce exposure.

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Type of training	Title of training program in English	Sector/institution that organizes the training (Provider organization)	Level of course/project	Thematic area
Formal	Risk mitigation measures for pesticides use - eLearning module	BTSF ACADEMY - European Commission	International programs implemented by EC	Info about pesticide risk assessment and management, specific tools, techniques and practices for lower exposure
Formal	Plant Health Surveys	BTSF ACADEMY - European Commission	International programs implemented by EC	key elements for plant health surveillance in the EU Building capacity at national level for the planning and implementation of plant healht surveys.
Formal + Non formal	Pesticide application equipment	BTSF ACADEMY - European Commission	International programs implemented by EC	consumer protection at the EU market and provide guarantees of the food from non-EU countries. inspection and calibration of pesticide application equipment
Formale – non formale	Higher technician responsible for agricultural, agri-food and agri-industrial production and processing specializing in agritech and smart agri-food 4.0	ITS Academy Territorio del Lavoro	Local programs implemented by regions, municipalities, european union, italian ministry of agriculture, private stakeholders (The course is funded by MIUR, NextGenerationEU, PNRR, integrations from Regione Piemonte, co-financed by ITS Academy Territorio del Lavoro)	working on the food production process, manage the process of procurement of raw materials and resources, design the cultivation plant, monitor business processes/outputs, according to current protocols and legal provisions, manage the certification and traceability system of products, prepare the quality control plan, apply remote sensing tools and technologies, analyze the elements of industrial automation and procedures of robotic systems, apply instruments and techniques of regenerative agriculture
Formale – non formale	TECHNICIAN OF PRECISION AGRICULTURE	ITS Agroalimentare per il Piemonte	The course is funded by MIUR, NextGenerationEU, PNRR, integrations from Regione Piemonte, co-financed by ITS Agroalimentare per il Piemonte, Futura	The person will be capable of working in the field of new technologies placed at the service of the farm; how to implement farm productivity and sustainability thanks to knowledge in agricultural mechanization.
Formale – non formale	Higher technician for the design and implementation of agricultural and agribusiness production and processing processes	Fondazione Minoprio ITS	The course is funded by POR FSE 2014/2020, MIUR, MISE with integrations from Regione Lombardia and co-financed by ITS Fondazione Minoprio	skills to promote innovation in the enterprise; technical professional skills of a "transversal" type to manage the work environment; technical-professional skills in the field of designing and implementing production and processing processes of agri-food product and to plan green services (design and implementation of green works) by applying innovative production techniques and technologies with low environmental

Poland

There are currently **9 orchard-related initiatives in Poland**. **7 of these are formal** and **2 non-formal** initiatives. **5 projects are national programmes, 2 are European projects, 1 project is commercial** (it is a **training** organised by Wrocław University of Environmental and Life Sciences) and **1 is organised by a local foundation**.

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The main recipients of these initiatives are orchardists, farmers activity related to the processing or marketing of agricultural, food; plant protection institutes, agricultural development agencies; adults involved in supply chains and agri-food processing together with industries co-existing with supply chains.

Training and project topics include, in particular, variety selection, plot management, authorised plant protection products and fertilisers, orchard practices including organic farming, green and digital skills, diversification and shortening of the agricultural and food supply chain and building the resilience of the actors involved in the chain.

Training courses and projects related to crop diseases organized in Poland last from five hours to five years.

Type of training	Title of training program in English	Sector/institution that organizes the training (Provider organization)	Level of course/project	Thematic
Formal	Small-scale processing 2024 (Małe Przetwórstwo 2024)	Ministry of Agriculture and Rural Development	National programs	Diversifying and shortening the supply chain of agricultural and food products and building the resilience of the actors involved in the chain
Formal	Organic orchard production	Wrocław University of Environmental and Life Sciences	Commercial training	Training topics: selection of varieties, how to manage plots, authorised plant protection products and fertilisers
Formal	Training in orchard plant protection	Warsaw School of Life Sciences	National programs	Fruit groving farming practices
Formal	Organic farming principles, new funding opportunities under the CAP 2023-2027	Mazovia Agricultural Advisory Centre (MODR)	National programs	Organic farming techniques, crop diseases, sustainable farming techniques
Formal	Training for farmers in the framework of the NP CAP 2023-2027	Świętokrzyski Agricultural Advisory Centre in Modliszewice	European programs	Sustainable management of natural resources, entrepreneurship
Formal	Fruit and vegetable processing - Training	Agricultural Advisory Centre in Brwinów	National programs	Organic farming techniques, marketing in farming
Formal	Training in integrated crop production for fruit plants or vegetable plants or agricultural crops	Łódź Agricultural Advisory Centre	National programs	Plant protection
Non-formal	REGENERATIVE AND PRECISIVE AGRICULTURE IN PRACTICE	Terra Nostra Foundation	training course privately organised by the foundation	Regenerative agriculture
Non-formal	training for the food industry, processing	EQVEGAN	International (EU project)	Green and digital skills

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4. DISCUSSION AND CONCLUSION

Based on a needs assessment report (**part I**) on the compiled results of the survey conducted among farmers, packinghouses' staff, other persons working in the fruit industry, plant protection institutes, agricultural development agencies in the KICRO project partner countries, it was noted that orcharding is an active branch of agriculture. Farmers, however, **face difficulties in maintaining a high level of production** and thus in obtaining an adequate income from fruit growing. To this end, they **use organic methods in addition to traditional cultivation methods**.

Much of the **crop loss is due to climate change** in Europe and the **difficult access to skilled workers**.

When it comes to access to information on initiatives and projects related to fruit-growing, there is still a lot to be done. **Information does not reach everyone and the process of applying for subsidies, funds and participation in projects is difficult for farmers, takes time and is associated with a high level of bureaucracy**.

Following a survey on existing programmes and resources related to crop diseases (**part II**) in the KICRO project partner countries, i.e. Bulgaria, Cyprus, Greece, Italy and Poland, the existence of various initiatives in this field was noted.

A total of 40 initiatives were recorded, of which the largest number were **non-formal (26)** and **formal (11).** 3 initiatives were classified as formal/non-formal.

Many international programmes are those co-funded or financed by the European Union (especially Horizon Europe). Several initiatives are implemented by local foundations, universities and agricultural advisory agencies in the respective countries.

In the surveys carried out, it is apparent that there is a lack of local projects and free remote tutorials/platforms for those involved in orchard and fruit processing industry.

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5. APPENDIX

1. Questionnaire in English:

KICRO - Knowledge and Identification of CROP diseases for sustainable food safety

* Wskazuje wymagane pytanie

Introductory questions

Introduction to the questionnaire:

The questionnaire was created for the project: ***KICRO - Knowledge and Identification of CROP diseases for sustainable food safety (project agreement number 2023-1-PL01-KA220-VET-000157664)***, implemented under **the Erasmus + program.**

Aim of the questionnaire:

to get information about current skills in crop diseases by the stakeholders (farmers and packinghouses' staff).

Target group:

farmers and packinghouses' staff from the 5 countries that make up the consortium of the KICRO project.

The survey is **anonymous** and its results will be used to implement activities supporting fruit producers in Europe.

1. **1. Please indicate your gender:** *

Zaznacz tylko jedną odpowiedź.

- male
- female
- other

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2. **2. How old are you:** *

Zaznacz tylko jedną odpowiedź.

- ◯ under 25
- ◯ 25-35
- ◯ 36-45
- ◯ 46-55
- ◯ 56-65
- ◯ more than 66

3. **3. Please indicate whether you are:** *

Zaznacz tylko jedną odpowiedź.

- ◯ farmer
- ◯ packinghouses' staff

4. **5. Which country are you from?** *

Zaznacz tylko jedną odpowiedź.

- ◯ Bulgaria
- ◯ Cyprus
- ◯ Greece
- ◯ Italy
- ◯ Poland

I. FARMING PRACTICES IN THE FRUIT-GROWING SECTOR

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5. **1. How much land do you own?** *

Please choose.

Zaznacz tylko jedną odpowiedź.

- ◯ I don't own land
- ◯ less than 1 hectare
- ◯ 1-5 hectares
- ◯ 6-15 hectares
- ◯ over 15 hectares

6. **2. What is the main type of fruit crop you cultivate on your farm?** *

_____

7. **3. What type of farming practices you apply?** *

Please choose.

Zaznacz tylko jedną odpowiedź.

- ◯ conventional
- ◯ sustainable
- ◯ organic

8. **4. In your opinion, what are the most urgent challenges in the orchard sector?** *

Please choose one.

Zaznacz tylko jedną odpowiedź.

- ◯ climate issues
- ◯ abour shortages
- ◯ fluctuations in market demand
- ◯ excessive price fluctuations
- ◯ no specific challenges

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9. **5. What are the most common diseases that affect your fruit crops and how are you currently dealing with these issues?** *

10. **6. What, if any, organic or sustainable farming techniques do you apply in your orchards to support soil and environmental health?** *

Please choose 1 techniques.

Zaznacz wszystkie właściwe odpowiedzi.

- [ ] I do not use organic or sustainable techniques
- [ ] I provide permanent soil cover
- [ ] I use crop rotation
- [ ] Simplified tillage
- [ ] Intercropping
- [ ] Irrigation management system
- [ ] Organic fertiliser
- [ ] Bio-fertilisers (bacteria or fungi, humic acids to stimulate growth)
- [ ] Crop and animal husbandry systems (integration of crops with livestock)
- [ ] Other

11. **6a.** *If in question 6. you have choosen "Other", please specify.*

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12. **7. Have you ever used IPM-based techniques?**[IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices and use of resistant varieties] *

Please choose.

Zaznacz tylko jedną odpowiedź.

- ◯ Yes
- ◯ No

II. TRAINING AND SUPPORT PROGRAMMES IN THE FRUIT-GROWING SECTOR

13. **1. How do you rate the availability of skilled labour for cultivation and harvesting work in orchard sector?** *

Please choose.

Zaznacz tylko jedną odpowiedź.

- ◯ good, easy availability
- ◯ difficult availability
- ◯ no availability
- ◯ access to unskilled labour only

14. **2. Would you like to receive specialist training or advice on crop disease control** *

Please choose.

Zaznacz tylko jedną odpowiedź.

- ◯ Yes
- ◯ No

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15. **3. On average, how many hours per year do you devote to training and updating your knowledge of orcharding?** *

Please choose.

Zaznacz tylko jedną odpowiedź.

- ◯ I don't take part in any training
- ◯ I receive training (less than 20 hours per year)
- ◯ I participate in training (between 21 and 50 hours per year)
- ◯ I participate in training (more than 50 hours per year)

16. **4. What resources or training opportunities would you like to have available to improve your knowledge and skills on crop diseases control in the orchard sector?** *

Please choose one.

Zaznacz tylko jedną odpowiedź.

- ◯ biological and microbiological methods for the protection of orchard plants
- ◯ agrotechnical and physical methods of orchard plant protection
- ◯ chemical and biotechnical methods for the protection of fruit plants
- ◯ epidemiology of fruit plant diseases
- ◯ fruit plant protection products
- ◯ support programmes for farmers in the fruit-growing sector.

17. **5. Are you currently involved in any projects aimed at crop protection, crop disease control in the orchard sector?** *

Please choose.

Zaznacz tylko jedną odpowiedź.

- ◯ Yes
- ◯ No

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18. **6. Are you up to date with the availability of information on support programmes (including purchase of inputs) in the context of the orchard sector?** *

Please choose.

Zaznacz tylko jedną odpowiedź.

- ◯ I am not up to date
- ◯ I am up to date

19. **7. Are you aware of any national or European programmes to support the orchard sector, particularly in relation to plant protection, crop disease control?** *

Please choose.

Zaznacz tylko jedną odpowiedź.

- ◯ Yes
- ◯ No

20. **8. What challenges do you face in terms of the application process for programmes/fundings that help to manage fruit growing sector?** *

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III. ECONOMY ASPECTS OF THE FRUIT-GROWING SECTOR

21. **1. What is the approximate percentage of crop losses in your farm during and after harvest?** *

Please choose.

Zaznacz tylko jedną odpowiedź.

- ◯ There was no crop loss
- ◯ Less than 5%
- ◯ 5-20%
- ◯ 21-35%
- ◯ 36-50%
- ◯ 51-70%
- ◯ 71-90%
- ◯ More than 90%
- ◯ Opcja 8

22. **2. What is the main factor causing crop losses in your farm during and after harvest?** *

Please choose one.

Zaznacz tylko jedną odpowiedź.

- ◯ weather conditions
- ◯ harvesting methods
- ◯ irrigation water quality
- ◯ microbial infestation
- ◯ insect pest inoculum residues
- ◯ market demand
- ◯ handling methods, such as packaging materials
- ◯ methods of transport
- ◯ level of knowledge and awareness in the respective environment

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23. **3. What preventive measures or strategies do you apply to minimise the risk of loss of your fruit crops** *

24. **4. Have you suffered economic losses due to fruit diseases in the last 3 years?**

Please choose.

Zaznacz tylko jedną odpowiedź.

- ◯ Yes
- ◯ No

25. **4a.** *If yes, please indicate how many percentage.*
Please choose.

Zaznacz tylko jedną odpowiedź.

- ◯ up to 10%
- ◯ 11-30%
- ◯ 31-50%
- ◯ 51-70%
- ◯ 71-90%
- ◯ 91-100%

Consent to processing of personal data for the purposes of the questionnaire

* Filling in the questionnaire, I consent to the processing of my personal data (The administrator of the personal data is *please insert your full organisation's name and post address and email address*).

The personal data will be processed in accordance with Regulation (EU) 2016/679 of the European Parliament and of the Council of 27.04.2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data and repealing Directive 95/46/EC (Official Journal of the EU L 119, p. 1) for the purpose of the questionnaire.

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KICRO

Thank you for filling in the questionnaire!

For more information visit the project website at:
www.kicro.eu

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2. Template: report: Research on existing programs and resources related to crop diseases

KICRO

Research on existing programs and resources related to crop diseases in [WRITE COUNTRY NAME]

sn	Type of training (formal, informal, non-formal or other)	Title of training program in English	Sector/institution that organizes the training (Provider organization)	course/project/programme (international programs: implemented by international consortia, founded by the EU, Norway Grants, etc.; national programs: implemented by the state, founded, co-founded by the state, etc.; local programs: implemented by regions and municipalities, founded and co-founded by local authorities, private	Target group (farmers, packinghouses staff, production/storage/distribution staff, plant protection institutes, agricultural development agencies, if other please specify)	Thematic area (i.e fruit growing farming practices, diseases that affect fruit crops, organic or sustainable farming techniques, entrepreneurship, integrating new jobs into the sector)	Pre-requirements of attendance or registration, if needed (online, off line, not needed)	If training, write about training content (agenda, thematic units, modules)	Duration of training/programme/project	Useful links	Comments
1											
2											
3											
4											
5											
6											
7											
8											
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