IPUD - Supporting Sustainable Cotton Value Chains in Turkey

1st Progress Report
November – January 2021

This project is funded by European Bank for Reconstruction and Development and the technical assistance services within the project are provided by Frankfurt School of Finance & Management gGmbH.

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Project Synopsis

Project Title: C45379/13014/88110 for Turkey: Supporting BCI standards in Turkey through Technical Advisory

Country: Turkey

Programme Design:

Supporting Sustainable Cotton Value Chains in Turkey is a comprehensive project developed by the EBRD and IPUD which aims to increase the efficiency of cotton farming in Turkey by developing and introducing best practices and a sustainable cotton standards system that meets the requirements of BCI-compliant cotton production, thus overall improving the environmental, economic and social impact of cotton production in Turkey.

Objective:

The project's overall objective is to develop the capacities of Implementing Partners (IPs), field facilitators, farmers and ginners to improve the adoption of BCI standards and the efficiency of cotton farming in Turkey. The assignment has six specific objectives supporting the overall objective:

- Provide technical and agronomist advice and development of training materials to enable cotton farmers, ginners and trainers to meet and adhere to the Better Cotton Principles and Criteria;
- Giving ToTs by carrying out training activities on each BCI principle for IP staff (e.g. IP Manager, Project Coordinator, Producer Unit Manager (PU), Field Facilitator (FF)) Activities to include technical aspects of each principle and methods for delivery to farmers;
- Work with other stakeholders to set up demo farms and hold on-farm practical training to cover and demonstrate aspects of good practice in cotton-growing;
- Hold a general recruiting and training event to raise awareness among ginners on relevant topics;
- One-to-one advisory services for selected ten BC ginners and;
- One-to-one capacity-building support to IPs on determining the sustainability hotspots in the regions they work in, designing a Continuous Improvement Plan (CIP) on training priorities supports the adoption of more sustainable farming practices, and improving their capacity on the mapping of agricultural resources.

Expected Programme Outputs:

Project expected to achieve the following outputs:

a) Under the Advisory for Farmers:

- Farmer training modules and materials developed and accepted by the EBRD on five principles;
- A Training of Trainers program;
- ToT Handbook prepared and distributed to IPs;
- ToT Trainings delivered for two IPs in two regions for all IP Staff (at least 15 persons);

- Mapping methodology (water, soil and biodiversity) for IPs provided and accepted by the EBRD;
- Set-up and operation of 4 pilot farms in 2 IPs. A report on the success of the pilots with recommendations of improvements
- A report completed with resources mapped in two pilot villages and four pilot farmers;
- A report on the success of the FT & ToT programme with recommendations for improvement.

b) Under the Advisory for Ginners:

- Ginners training programme modules and materials developed and accepted by EBRD and IPUD;
- Assessment Report on Health & Safety, fibre quality-related issues, process management conditions of ten ginners;
- Assessment Report on structural ginning improvement needs for ten ginners;
- Report on one-to-one advisory services provided to ten ginners (including a note on required structural ginning improvements /Capex investments and financing developed and discussed with ginners);
- Report on general advisory on ginner activities successes and improvement suggestions.

c) Under the Advisory for Implementing Partners:

- Sustainability hotspots are chosen and Continuous Improvement Programs (CIP) designed for two Producer Unit managers (PUs) per IP; the total of four PUs will receive CIP; a report prepared for the usability of CIP.

Project starting date: November 10, 2020

Project duration: 13 months (November 19, 2020 – December 31, 2021)

1 Overview of Progress and Achievements in the Reporting Period

This report explains the work packages of the Technical Consultancy (TC) activities and summarises the progress and achievements as to the different work packages during November 2020 – January 2021 period.

1.1 Kick-Off Meeting

Organising a kick-off meeting with the contribution of EBRD and IPUD is the first activity of the project which aims to introduce expert team, tasks and implementation period to the project stakeholders. The meeting was held on November 20 through online tools due to the COVID-19 pandemic. During the meeting, project experts were introduced to EBRD and IPUD, and project activities and approaches were presented to the project stakeholders. Kick-off meeting presentation can be found on Annex 1.

1.2 Work Package 1: Activities Related to Farmers and Trainers

Work Package 1: Activities Related to Farmers and Trainers
Objective: To increase farmers' and trainers' capacity through a farmer training and training of trainers (ToT) programme.
Activities – Phase I
✓ Develop a farmer-training programme (FT) on five principles ✓ Develop a training of trainers (ToT) programme ✓ Develop a survey method to measure the impact of the FT and ToT programme ✓ ToT Handbook preparation and distribution to IPs ✓ Delivery of ToTs for two IPs in two regions for all IP Staff (Canbel and WWF) ✓ Participate in observing FTs to measure the success of the FTs and ToTs* ✓ Report on the success of the ToT/FT training with the recommendation of improvements
Outputs: ✓ Survey for farmers and trainers; ✓ Farmer training modules and materials; ✓ A Training of Trainers program; ✓ ToT Handbook prepared and distributed to IPs; ✓ ToT Trainings delivered for two IPs in two regions for all IP Staff (at least 15 persons);

The project activities have started by the farmer training work package of the project. To analyse the IPUD's previous works and inform the expert team, IPUD has shared the BCI ToT materials, IPUD ToT materials, farmer training delivered by the implementation partners, resource maps, contnious improvement plans and informative documents on BCI principles on December 4. These materials were distributed to project experts as a guideline for their future tasks in the project.

Training Needs Assessment of Training of Trainers

Since the trainers might have different levels of expertise, TC team prepared a survey for the implementation partners to measure their knowledge level and training needs by considering the BCI principles. This survey was conducted through the Surveymonkey. From Canbel, three field facilitators, two producer unit managers and one implementation partner manager have

participated in survey. On WWF side, only one implementation partner manager and one producer unit manager have participated. In this survey, seven questions were asked to the participants. In first question, the experience of the trainers in both IPUD Project and farmer training was questioned. Average experience of trainers of Canbel was identified as two years in IPUD project and 3.6 years in farmer trainings. In WWF, the participants' average experience was calculated as two and a half year for both farmer trainings and IPUD project. In the second and third questions, project's major aims and the activities were identified on the participants' perspective through the open-end questions. Following that, the easeniess and difficulties of their job were asked to the participants and identified from their viewpoint. Sixth and seventh questions of the survey can be considered as question groups. In the first group, the participants were asked to evaluate themselves and in the second one evaluate the farmers within their regions on the BCI principles and it's subtopics. The results of this survey are presented on Annex 2.

A Brief Note on the Production Characteristics of Different Regions

To identify the regions' specific characteristics on the cotton production, TC team prepared a brief note according to their previous field experience and shared this document with IPUD and implementation partners. The findings on this report were discussed together with the implementation partners to collect their feedback and reflect their expertise. Following the preparation of this document, IPUD and TC team decided to prepare a comprehensive survey to the farmers since the BCI farmers have higher knowledge on the production than the other producers in the project's regions. This brief report can be found on Annex 3.

Farmer Surveys

To determine the farmers' knowledge level, the TC team were designed a survey and shared with the IPUD and implementation partners on December 18. This farmer survey was designed as an exam since the self-evaluation might not reflect the field's reality on the farmers' perspective, and seventeen questions were prepared. Following the prearartion of draft exam, the feedback of the IPUD and implementation partners were collected and the field survey finalised on December 30th. The implementation partners have applied this survey to their farmers between the 5th and 10th of January, and IPUD and TC team have monitored the answers in parallel. The number of survey participants from Izmir and Manisa provinces (Canbel's region) were 263, and 146 for Aydın province (WWF's Region). Results of this survey were analysed by the TC team right after the completion and finalised on January 21, by making necessary revisions according to the feedbacks of IPUD.

Through this survey, the farmers' correct and wrong practices were determined for each important production topics in line with the BCI principles. This collected information will be used in the training materials and will be of great importance in other activities of the project. These results show that, the knowledge levels of farmers in two different regions vary considerably. For this reason, focused topics in the training and other activities must be different for both areas. It was also identified that the producers' knowledge level on specific issues was much higher than expectations. But, they have been struggling to transfer this knowledge into the practice. The result report of this survey is presented in Annex 4.

1.3 Work Package 2: Activities Related to Ginners

Work Package 2: Activities Related to Ginners

Objectives:

Develop the capacity of ginners to enable them to meet and adhere to the Better Cotton Standards, and improve their standards in terms of lint quality, health and safety, traceability and process management, structural ginning improvements and ways to finance their improvements.

Activities:

- Develop a ginner training programme
- Develop a survey method to measure the impact of the ginner training programme
- Assess ten ginners on health & safety, fibre quality-related issues, traceability and process management, structural ginning improvement needs and ways to finance their improvements;
- Assessment report on health & safety, fibre quality-related issues, traceability and process management, structural ginning improvement needs and ways to finance their improvements of ten ginners
- Assessment report improvement needs for ten ginners
- Hold a general recruiting and training event to raise awareness among ginners on relevant topics (Izmir)
- One-to-one advisory services for selected ten BC ginners
- Report on one-to-one advisory services provided to ten ginners
- Report on general advisory on ginner activities successes and improvement suggestions

Outputs:

- ✓ Ginners training programme modules and materials developed and accepted by EBRD and IPUD;
- ✓ Assessment Report on health & safety, fibre quality-related issues, traceability and process management, structural ginning improvement needs and ways to finance their improvements of ten ginners;
- ✓ Assessment Report on improvement needs for ten ginners;
- ✓ Report on one-to-one advisory services provided to ten ginners (including a note on required structural ginning improvements /Capex investments and financing developed and discussed with ginners);
- ✓ Report on general advisory on ginner activities successes and improvement suggestions

Activities related to ginners are expected to be started on February 2021 due to the ginners' busy schedule on ginning season between November 2020 and February 2021.

1.4 Work Package 3: Activities Related to Pilot Farms

Work Package 3: Activities Related to Pilot Farms

Objectives:

Set-up pilot farms to demonstrate good practices and their benefits to the farmers.

Activities – Phase I:

- Support IPs on developing pilots' subjects and selection of demo plots in 4 farmers in 2 different villages
- Develop a survey method to measure the impact of the pilots
- Setting up demo farms (4 farmers/demo plants in 2 different villages) & delivery of on-farm practical training to cover and demonstrate aspects of good practice in cotton growing.
- Create a model in pilot villages by mapping four pilot farmers' water, biodiversity and soil resources and support IPs on how to replicate the activity in other farms
- Follow & support piloting farmers
- Participate in observing pilots to measure the success of the pilots

- Report on the success of the pilot farms with the recommendation of improvements
- A report on the resources mapped in two pilot villages and four pilot farmers

Outputs – Phase I:

- ✓ Mapping methodology (water, soil and biodiversity) for IPs delivered and accepted by the EBRD;
- ✓ Set-up and operation of 4 pilot farms in 2 IPs. A report on the success of the pilots with recommendations of improvements
- ✓ A report completed with resources mapped in two pilot villages and four pilot farmers;
- ✓ A report on the success of the FT & ToT programme with recommendations for improvement;

Selection of Pilot Subjects

Establishment of pilot farms are one of the most important activities of the project to demonstrate the best practices in line with the IPUD principles to farmers. In this activity, the TC team first prepared an excel sheet containing project ideas with a scoring section, and distributed to IPUD and implementation partners. All the project parties put their pilot ideas into this sheet, and evaluated other ideas with the scores from 1 to 10. These ideas were ranked by their average points from higher to lower, and a pilot subject was identified for each BCI principle. The list of identified subjects was presented to IPUD and implementation partners and finalised through their feedback and suggestions. This selection can still be considered as a draft and some topics might be added, removed or changed during the implementation by considering the other conditions such as budget, farmer type, etc. These preliminary pilot topics are presented in Annex 5.

Pilot Trial Plans

According to the preliminary topics, TC team were identified two trials as 1) Effects of Good Practices According to BCI Principles on the Yield and Quality of Cotton and 2) Rehabilitation of a Degraded Area for the Cotton Production and prepared the trial plans. Within these plans; aims, methods, expected results, expected achievements, control group, requirements and difficulties for each production stage was presented. Besides, order of the trials stages and desired farmer profile were also identified. These plans were presented to IPUD and implementation partners on January 25, and their comments and feedback are expected on 29 of the same month. After that the TC team and implementation partners will start the pilot trials through the analyses on February 2021. These plans will be presented in the next progress report following the finalisation.

1.5 Work Package 4: Activities Related to IPs

Work Package 4: Activities Related to IPs

Objectives:

Support the IPs on the Continuous Improvement Plan design, selection of sustainability hotspots, and mapping agricultural resources.

Activities – Phase I:

- Determining the sustainability hotspots in the regions where IPs work in to support them designing a Continuous Improvement Plan
- One-to-one capacity-building support to IPs & Design of Continuous Improvement Plan (CIP) on training priorities.
- Develop methodology on how to map agricultural resources, including water, biodiversity and soil
- Regular follow-up and observation of CIPs
- A report prepared for the usability of CIP for a total of four Producer Units.

Outputs – Phase I:

- ✓ Sustainability hotspots will be chosen and Continuous Improvement Programs (CIP) designed for two Producer Unit managers (PUs) per IP; the total of four PUs will receive CIP; a report prepared

for the usability of CIP.

Follow-up Meetings with the IPs

Following the inception period of the Project, IPUD organised an introduction meeting on November 30 with the participation of implementation partners and TC team. In this meeting, parties agreed on regular follow-up meetings on a bi-weekly basis. The dates of these meetings within the reporting period are given in Table 1. Apart from those meetings; TC team and IPUD and IPs have been conducting regular communications related to all project activities through the project period.

Table 1. Meeting dates with the implementation partners within the reporting period.

Meeting Number	Date and Time	Implementation Partner
1	Date: 30.11.2020 Time: 15.00-16.00 (Istanbul time)	Introduction Meeting Canbel and WWF
2	Date: 15.12.2020 Time: 11.00-12.00 (Istanbul time)	Canbel
3	Date: 17.12.2020 Time: 16.00-17.00 (Istanbul time)	WWF
4	Date: 29.12.2020 Time: 10.00-11.00 (Istanbul time)	Canbel
5	Date: 30.12.2020 Time: 16.00-17.00 (Istanbul time)	WWF
6	Date: 12.01.2021 Time: 10.00-11.00 (Istanbul time)	Canbel
7	Date: 14.01.2021 Time: 16.00-17.00 (Istanbul time)	WWF
8	Date: 26.01.2021 Time: 10.00-11.00 (Istanbul time)	Canbel
9	Date: 28.01.2021 Time: 16.00-17.00 (Istanbul time)	WWF

To start the other activities in this work package, the TC team are expecting the finalisation of the farmer surveys to understand the current situation and identify the topics to be focused on the continuous improvement plans. These activities will be started at the beginning of February 2021.

1.6 Progress on the Project Workplan

N°	Activities	Nov-20				Dec-20				Jan-21				Feb-21			
A-1	**Activities related to Farmers/ToT**																
A-1.1	Develop a farmer-training programme (FT) on five principles			■	■	■	■	■	■	■	■	■	■	■	■	■	■
A-1.2	Develop a training of trainers (ToT) programme						■	■	■	■	■	■	■	■	■	■	■
A-1.3	Develop a survey method to measure the impact of the FT and ToT programme													■	■	■	
A-1.4	ToT Handbook preparation and distribution to IPs																
A-1.5	Delivery of ToTs for two IPs in two regions for all IP Staff (Canbel and WWF)																
A-1.6	Participate in observing FTs to measure the success of the FTs and ToTs*																
A-1.7	Report on the success of the ToT/FT training with the recommendation of improvements																
A-2	**Activities related to ginners**																
A-2.1	Develop a ginner training programme													■	■	■	■
A-2.2	Develop a survey method to measure the impact of the ginner training programme																
A-2.3	Assess ten ginners on health & safety, fibre quality-related issues, process management, structural ginning improvement needs													■	■	■	■
A-2.4	Assessment report on health & safety, fibre quality-related issues, process management conditions of ten ginners													■	■	■	■
A-2.5	Assessment report on structural ginning improvement needs for ten ginners																
A-2.6	Hold a general recruiting and training event to raise awareness among ginners on relevant topics (Izmir)																
A-2.7	One-to-one advisory services for selected ten BC ginners																
A-2.8	Report on one-to-one advisory services provided to ten ginners																
A-2.9	Report on general advisory on ginner activities successes and improvement suggestions																
A-3	**Activities Related to Pilot Farms**																
A-3.1	Support IPs on developing pilots' subjects and selection of demo plots in 4 farmers in 2 different villages			■	■	■	■	■	■	■	■	■	■	■	■	■	■

N°	Activities	Nov-20				Dec-20				Jan-21				Feb-21			
A-3.2	Develop a survey method to measure the impact of the pilots[1]																
A-3.3	Setting up demo farms (4 farmers/demo plants in 2 different villages) & delivery of on-farm practical training to cover and demonstrate aspects of good practice in cotton growing.																
A-3.4	Create a model in pilot villages by mapping four pilot farmers' water, biodiversity and soil resources and support IPs on how to replicate the activity in other farms																
A-3.5	Follow & support piloting farmers																
A-3.6	Participate in observing pilots to measure the success of the pilots																
A-3.7	Report on the success of the pilot farms with the recommendation of improvements																
A-3.8	A report on the resources mapped in two pilot villages and four pilot farmers																
A-4	**Activities Related to IPs**																
A-4.1	Determining the sustainability hotspots in the regions where IPs work in to support them designing a Continuous Improvement Plan																
A-4.2	One-to-one capacity-building support to IPs & Design of Continuous Improvement Plan (CIP) on training priorities.																
A-4.3	Develop methodology on how to map agricultural resources, including water, biodiversity and soil																
A-4.4	Regular follow-up and observation of CIPs																
A-4.5	A report prepared for the usability of CIP for a total of four Producer Units.																
A-5	**Project Management & Backstopping Activities**																
A-5.1	Kick-off Meeting***																

Completed and ongoing activities | Incomplete activities

[1] A-3.2 Develop a survey method to measure the impact of the pilots" activity is delayed since the pilot subject and farmer selection is not finalized yet and the preliminary analyses are not conducted.

Annexes

Annexe 1 - Kick-off meeting presentation

Annexe 2 - Results of the training needs assessment of trainers

Annexe 3 - Brief note on the production characteristics of the project regions

Cotton Production Characteristics and Differences in Aegean Region

The agricultural production culture might vary from region to region, province to province, district to district and even from producer to producer in the same village. It is known that, the reasons of this variation could be climate and soil, capabilities of the producers, past experiences and habits, risk perceptions, mechanisation, monoculture or polyculture agriculture, production scale, irrigation options and input supply possibilities. Apart from that, processors, input dealers and agricultural support policies can also be somewhat effective in these differences. On the other hand, farm extension and awareness activities of the government, non-governmental organisations and agricultural consultants may also have impacts to the variation between region to region.

When looking at different plains in the Aegean Region in terms of cotton production culture, it can be seen that the production practices are nearly similar. However, there are certain differences under the many sub-components. For example, although the regions have similar features in minimising the harmful effects of plant protection methods; there are regional differences in disease and pest identification. The cotton production in Söke Plain of Aydın come into prominence on cotton production, which is thought to be almost mono-cultural area and differs from the other region in terms of production techniques. Thus, it will be meaningful to make comparisons in cotton farming by taking Söke plain as a basis. In this report, differences of cotton cultivation in Izmir, Manisa and other districts of Aydin province (Nazilli, Yenipazar, Çine, Karpuzlu, Koçarlı) was presented based on the principles of IPUD through our field observations.

Cotton Cultivation and Production in Söke Plain

In Söke plain, obtaining high efficiency and efficiency stands out as the producers' primary targets on cotton production. Therefore, the Plain's yield averages are far above the country average and almost monoculture agriculture can be seen in Söke. High or low cotton price expectations do not change the cotton production decisions of the farmers compared to other regions. The farmers in the plain produce cotton without considering the necessity of alternation every three years. For this reason, farmers tend to get over Ministry of Agriculture’s aternation obligation to receive support payments by sowing vetch in autumn.

Tillage is done very intensively within the Plain. All kinds of tools and equipment used in cotton farming are available on the region's farmers. Even though there is an awareness of zero-till agriculture, farmers do not believe this in practice. In the sowing period, soil annealing awareness is high, and pneumatic sowing machines are widespread.

Although soil analysis culture is common in the Plain, fertilisation cultures are based on rote, and the farmers have a common belief of getting more crops with more fertilisers. This situation threatens the sustainable soil resources

Input suppliers specialised on cotton farming are widespread and active in the region. The density of pesticide use in Söke is high for cotton disease and pest control. On the other hand, producers' knowledge of cotton disease and pest identification and diagnosis is relatively high. Although this is the case, it is necessary to use pesticides before each irrigation belief is common.

Irrigation water in the region is provided from the dams through open channels, and the standard irrigation method is flood irrigation.

Ginners are clustered in the region, and their impact on the production culture is more intensive than the other areas. It is seen that they promote exceptionally high quality and productive cotton production within the Plain.

The responsibility of biodiversity and land-use is weak in the Söke. The awareness of preserving and improving fibre

quality is very high.

Cotton Production Characteristics in the Other Districts of Aydın Province (Nazilli, Yenipazar, Çine, Karpuzlu, Koçarlı) and in Izmir Province

The cotton production characteristics of Izmir province and the other districts of Aydın province is almost similar and presented as a whole.

Cotton appears as an alternation crop in the other districts of Aydın and Izmir province. Farmers decide to produce cotton when it is highly supported and seen as profitable. Therefore, although the province's yield averages are far above the country average, they are not higher than the Söke plain.

Tillage is done intensively in these regions. All kinds of tools and equipment used in cotton farming are available, although not as common as the Söke plain. There is little or no awareness of zero-till agriculture. In the sowing period, soil annealing awareness is high, and pneumatic sowing machines are very common among the cotton farmers.

Although soil analysis culture is common in the region, fertilisation cultures are based on rote. This situation threatens the sustainable soil resources

Input suppliers are not as effective as the Söke plain. Pesticide use intensity is high in cotton disease and pest control. On the other hand, producers' knowledge of cotton disease and pest identification and diagnosis are moderate. Farmers' thought on the use of pesticides before each irrigation is also widespread in this region.

Flood irrigation is the primary irrigation method in Izmir and Aydin, and farmers irrigate their crops 4 to 6 times within a year. In the case of sandy soils, the irrigation amount can even be increased to 8 times.

The responsibility of biodiversity and land-use is weak in these regions. The awareness of preserving and improving fibre quality is high.

Cotton Production Characteristics in Manisa Province

Cotton production is not common in the plains of Manisa province. This region's essential products are grapevines, fruits and vegetables, and cotton is only produced when it is highly supported and seen as profitable. For these reasons, the yield averages of the province are around the country average.

Tillage is done intensively in Manisa. The inputs and tools used in cotton farming are not common in the province. The awareness of zero-till agriculture is almost negligible. In the sowing period, the awareness of soil annealing is high.

Although soil analysis culture is common in the region, fertilisation cultures are based on rote. This situation threatens the sustainable soil resources.

Input suppliers are not as effective as the Söke plain. Pesticide use intensity in cotton disease and pest control is lower than the other provinces. Producers' knowledge of cotton disease and pest identification and diagnosis is low. Farmers' thought on the use of pesticides before each irrigation is also widespread in this region.

Flood irrigation is the primary irrigation method in these regions, and farmers irrigate their crops 4 to 6 times within a year.The responsibility of biodiversity and land-use is weak and the awareness of preserving and improving fibre quality is lower than the other regions.

Annexe 4 - Report on the results of farmer surveys

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IPUD- Supporting Sustainable Cotton Value Chains in Turkey

Analysis of the Farmer Surveys

Ocak 2021

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1. Introduction

Within the context of EBRD and IPUD's "Supporting Sustainable Cotton Value Chains in Turkey" project, a survey is designed to understand the producers' knowledge level according to the BCI principles and regional differences. The survey was conducted by the project's implementation partners WWF in Aydın province and Canbel Agriculture in Izmir and Manisa provinces.

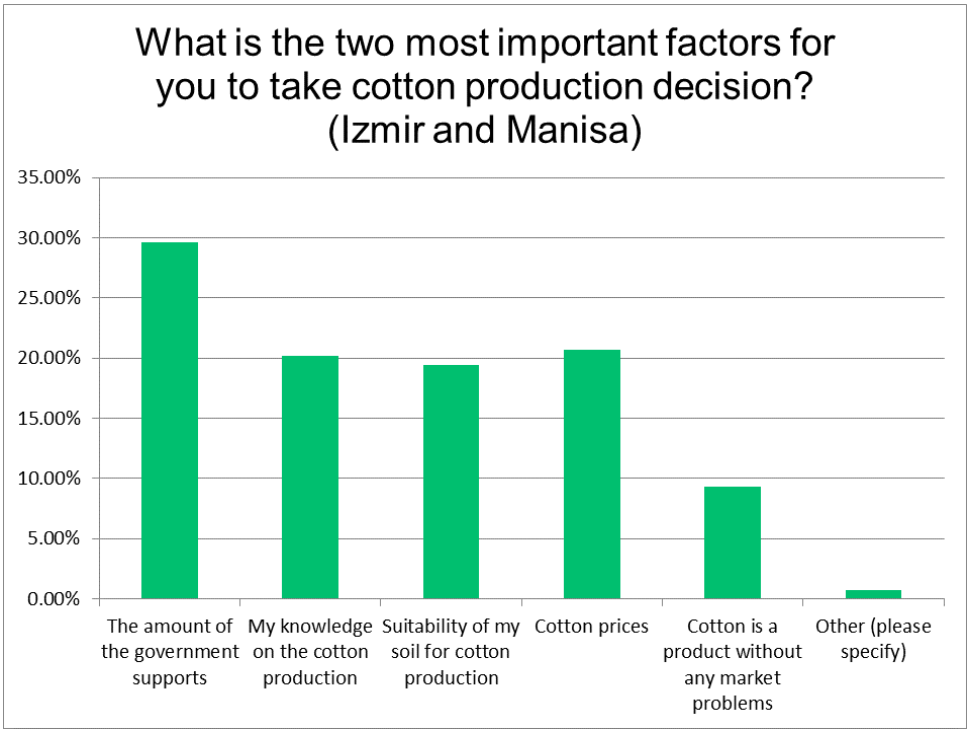
In Aydın province 146 producers have participated in this study. 129 of them are doing cotton cultivation in Söke plain while 17 farmers produce cotton in other districts of the province. Within the Izmir and Manisa provinces, 263 producers were participated to survey and the producer numbers in this region can be listed as 177 farmers in Izmir and 86 farmers in Manisa.

Within the context of this survey, 17 different questions were asked to the farmers. These questions aim to measure the farmers' knowledge level and identify the reasons for farmers' cotton production decisions.

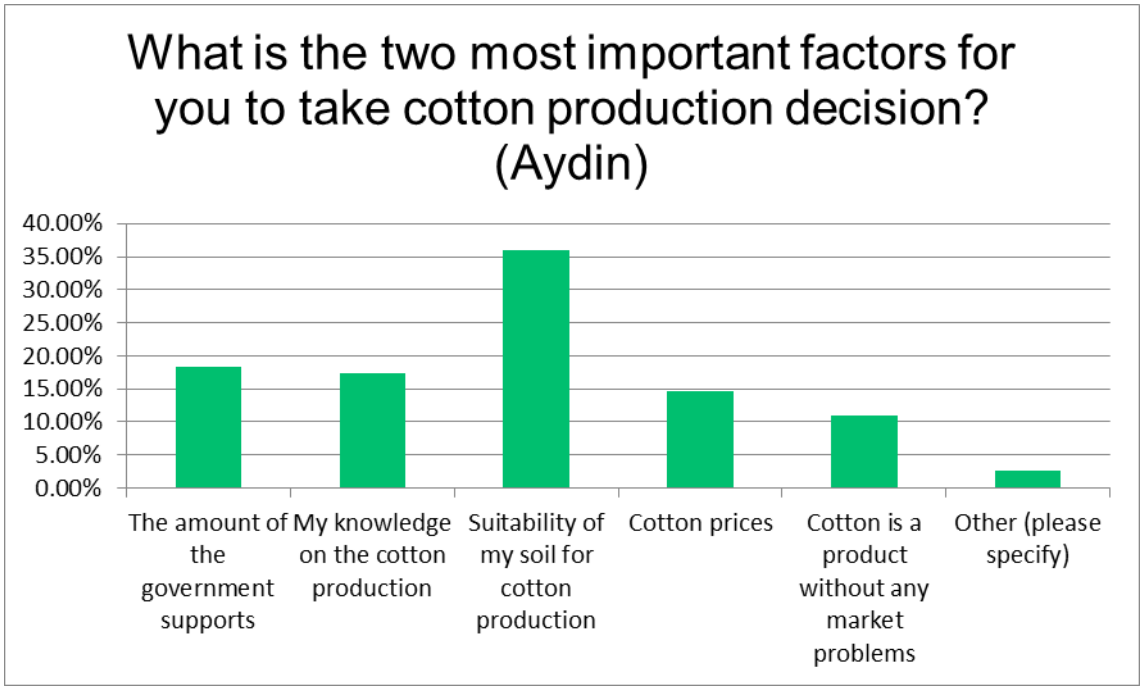
2. Survey Responses and Evaluation

2.1. What is the two most important factors for you to take cotton production decision?

In the first question, the two most important factors that led producers to cultivate cotton were asked. In İzmir and Manisa provinces, economic reasons (59.7%) appear to be the most critical factor in the farmers' cotton production decision. Within these responses, the amount of government supports rank first. This result is consistent with the Agricultural Outlook surveys that we have conducted before. Knowing the production technique also affects the production decisions of the farmers. In this survey, it is identified that there might be a significant decrease on the cotton cultivation areas of İzmir and Manisa provinces as a result of the decline in cotton prices or support amounts. When we look at the open-ended answers given to this question's other choice, different responses were observed, such as the necessity of a crop alternation, the presence of a ginning business in the producer's family, low water consumption of cotton etc.



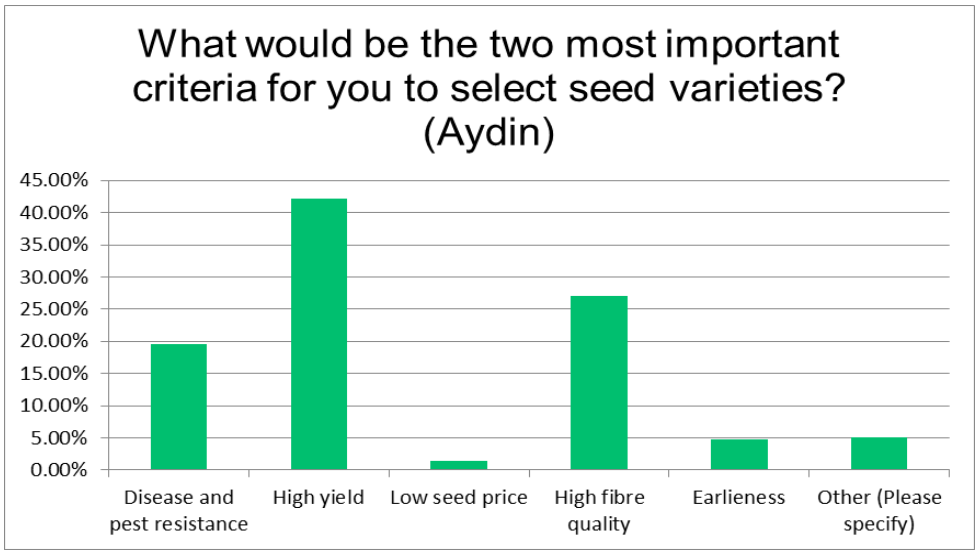
In Aydin provinde, different results are obtained than the İzmir and Manisa provinces. The cotton seen as a crop with regional importance, and the producers are specialised in the product. In this province, the most crucial factor on the farmers' production decision is the soil suitability (36%). Although their knowledge of the production technique is also influential in the product decision, it can also be seen that the state supports also have a critical factor on the producers' perspective.



2.2. What would be the two most important criteria for you to select seed varieties?

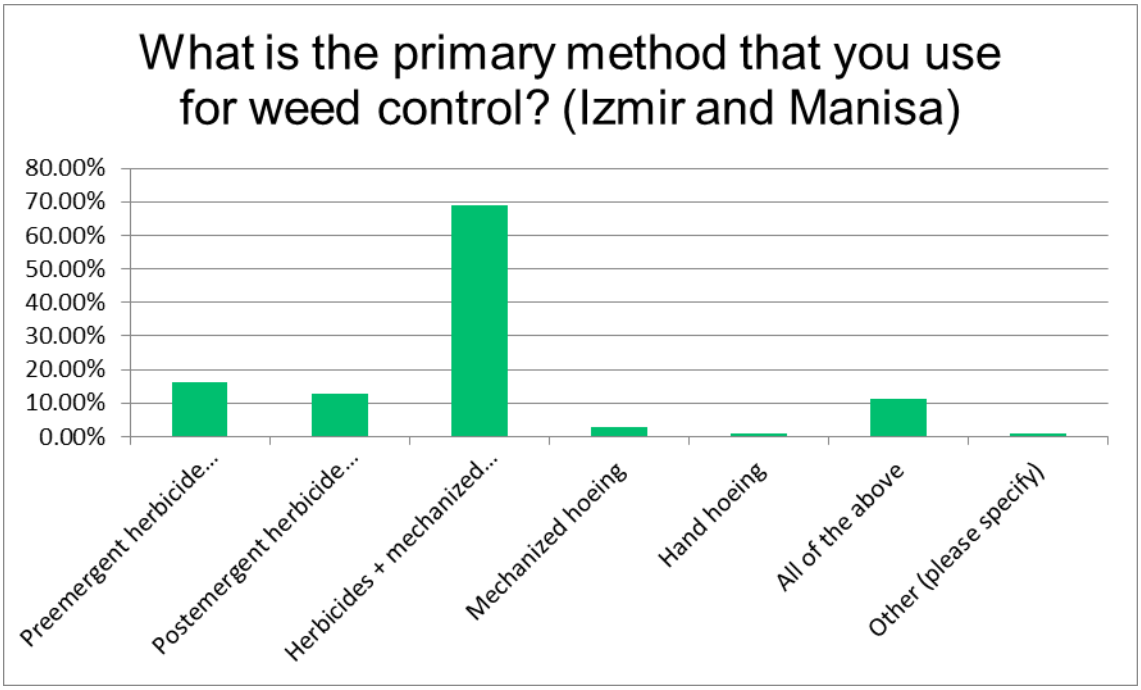
In the second question, the two most important criteria on selecting seed varieties were asked to the producers. High productivity came to the fore in Izmir and Manisa provinces as expected. Following this, the preference for disease and pest-resistant varieties (44%) is of great importance. It also shows the producers have an awareness of the disease and pest control other than pesticides. Apart from this, factors such as fibre yield, earliness and low seed price were important only for a particular producer group. According to these answers, it is necessary to improve the fibre yield and quality perception of the farmers.

In Aydın, high yielded varieties ranked first, and high fibre quality comes to the fore in the second place. According to these answers, it can be seen that cotton producers in Aydın give importance to product quality too. Resistance to diseases and pests ranks third in variety selection, These results shows that the producers in Aydin are more profit-oriented and trainings shall also be focused on the benefits of selecting high-resistant varieties.



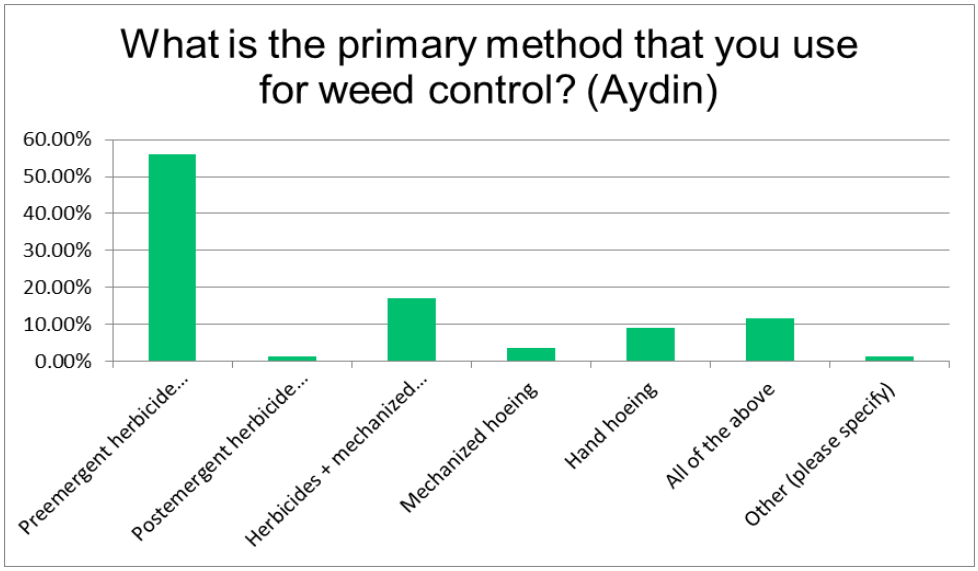
2.3. What is the primary method that you use for weed control?

It is observed that the producers in İzmir and Manisa provinces use of mechanical hoes and herbicides together to control weeds in their field. The farmers using other methods is relatively low. Considering the results, it is seen that the intensity of pesticide use in cotton agriculture in these provinces is quite high.



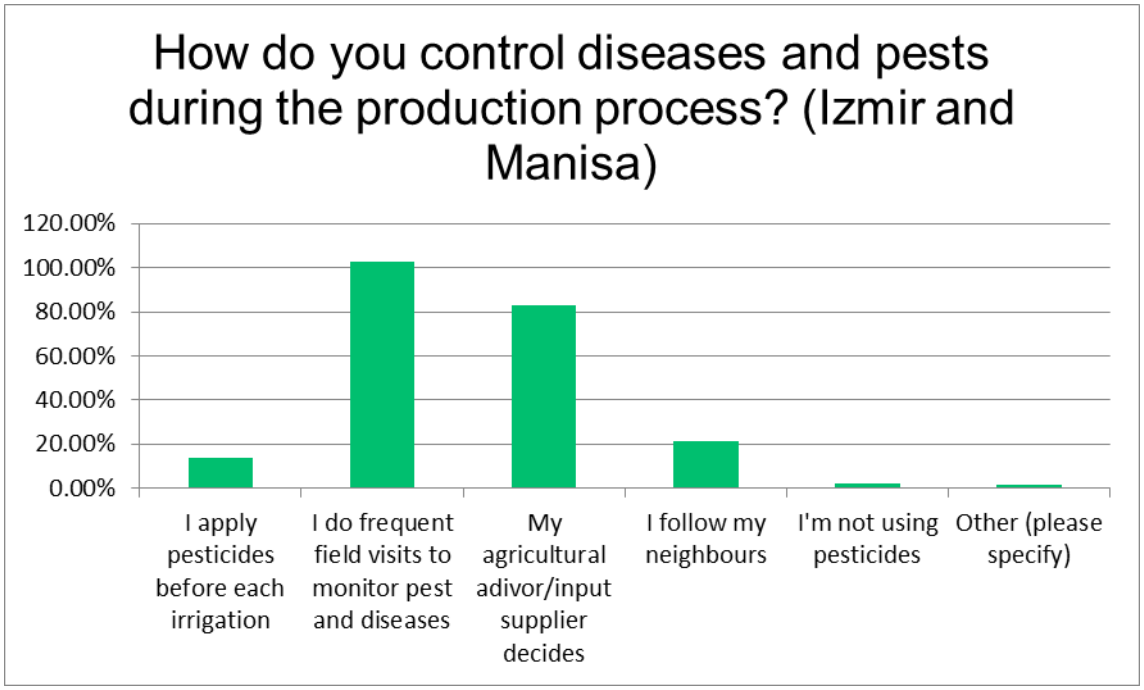
In Aydin province different results have been obtained. The producers in Aydın, prefer pre-planting herbicide applications to control the weeds in their fields. The number of farmers using only one method is very low just as in the other region. Similar to Izmir and Manisa, farmers in the Aydın province solely rely on herbicides for weed control and the benefits of

different environment-friendly methods shall be introduced to the farmers.



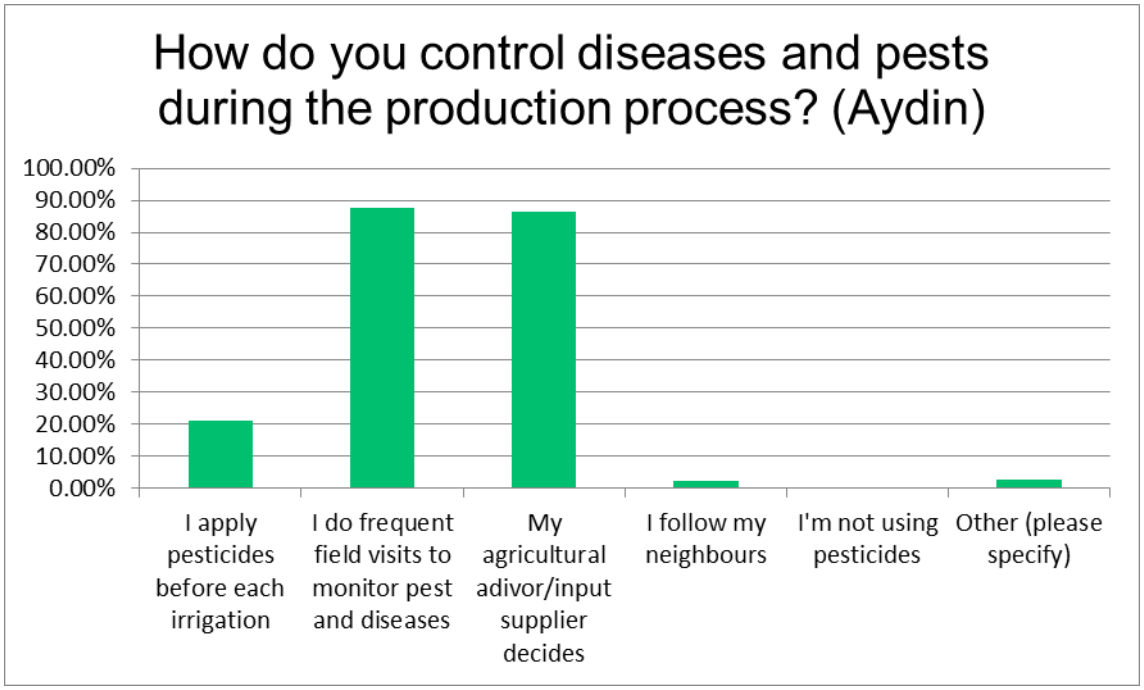
2.4. How do you control diseases and pests during the production process?

In İzmir and Manisa provinces, the majority of the producers control their fields by frequent visits to determine pests and diseases. This indicates, the knowledge level of the producers on the pest and disease control is higher than the expectations. The agricultural consultants ranked in the second place in this question, and it can be seen that they are also effective on the pest control decision of farmers. Besides, the pesticide application before each irrigation habit has started to be abandoned. However, the rate of these producers' is still high, and the farmer trainings shall also be focused on this topic.



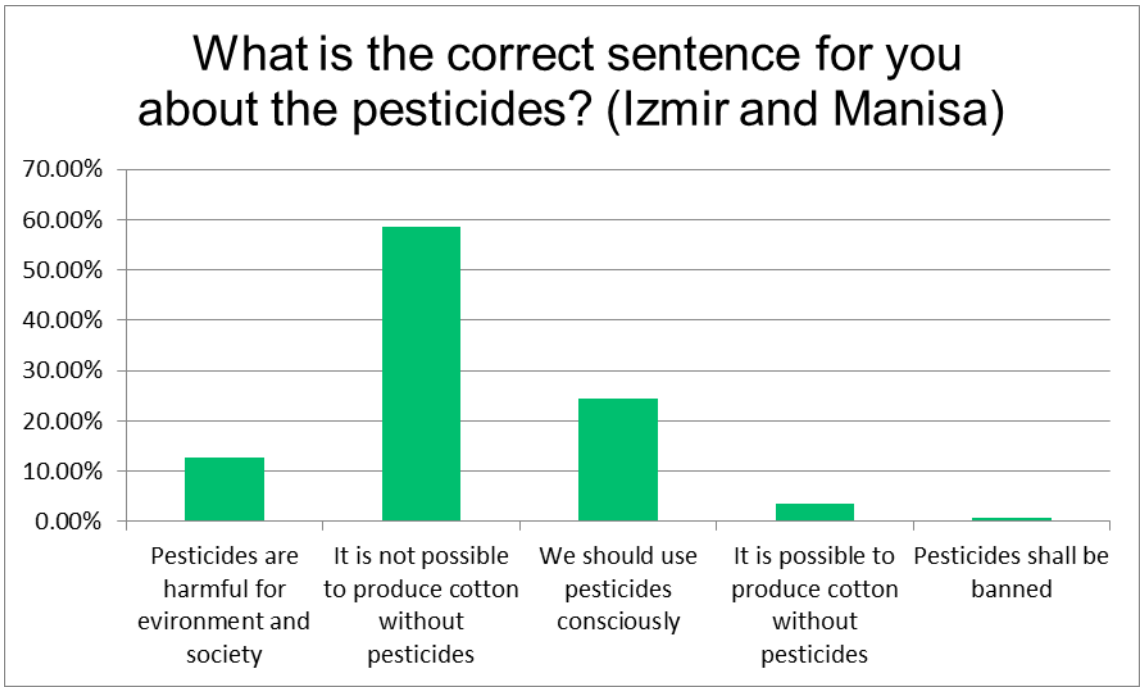
In Aydın province; similar results were obtained, and the majority of the producers control their fields by frequent visits to determine pest and diseases. Also, agricultural consultants have an important impact on pest and disease control decisions. However, the wrong applications such as pesticide application before each irrigation are still

on a considerable level and the farmer training must also be focused on this topic just as the other region.



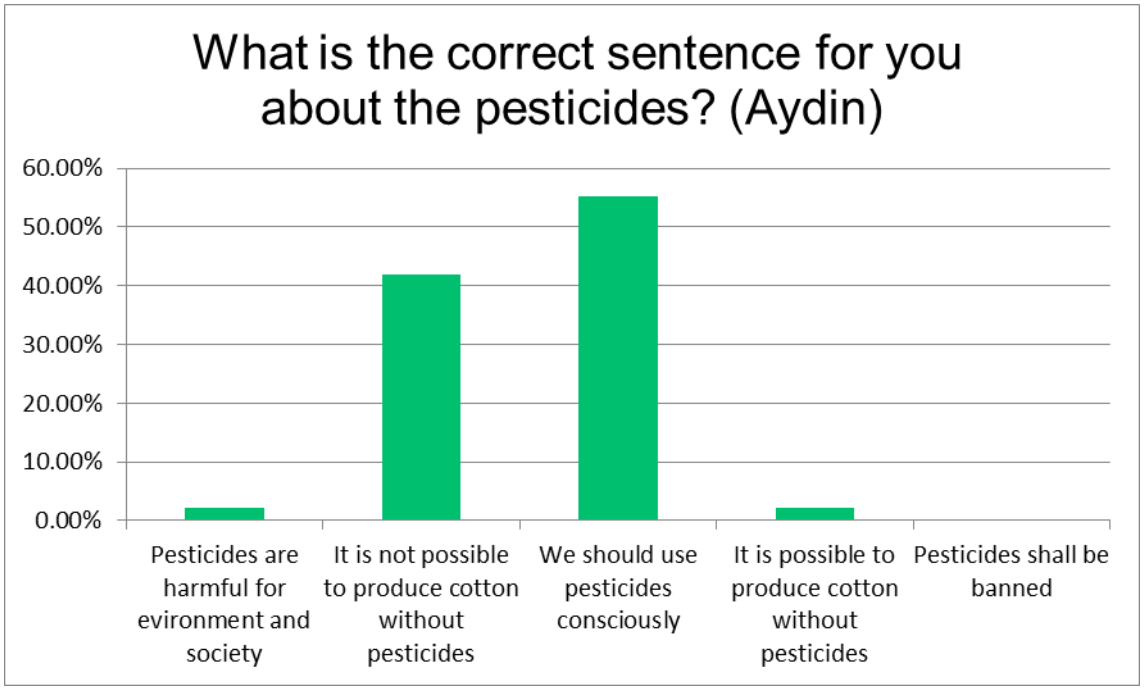
2.5. What is the correct sentence for you about pesticides?

In İzmir and Manisa provinces, although the "We should use pesticide consciously" answer ranks first, there is no awareness of farming without using pesticides. There might be difficulties on introduction and extending plant protection methods other than pesticides.



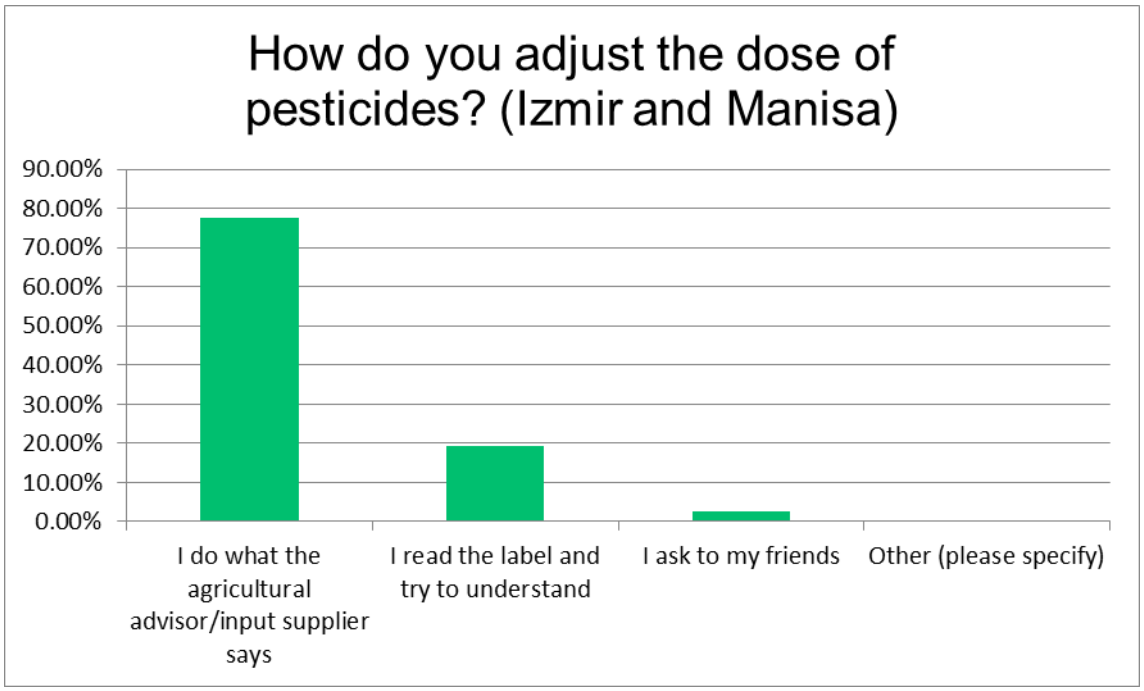
In Aydın, on the other hand, it is seen that the producers are more conscious than the producers in Izmir and Manisa, and more than half of the producers respond to pesticides shall be used consciously and pesticides will harmful to the society

answers. However, it has also determined that the agriculture cannot be done without pesticide perception is common, and it should be essential to focus on this issue during the trainings.

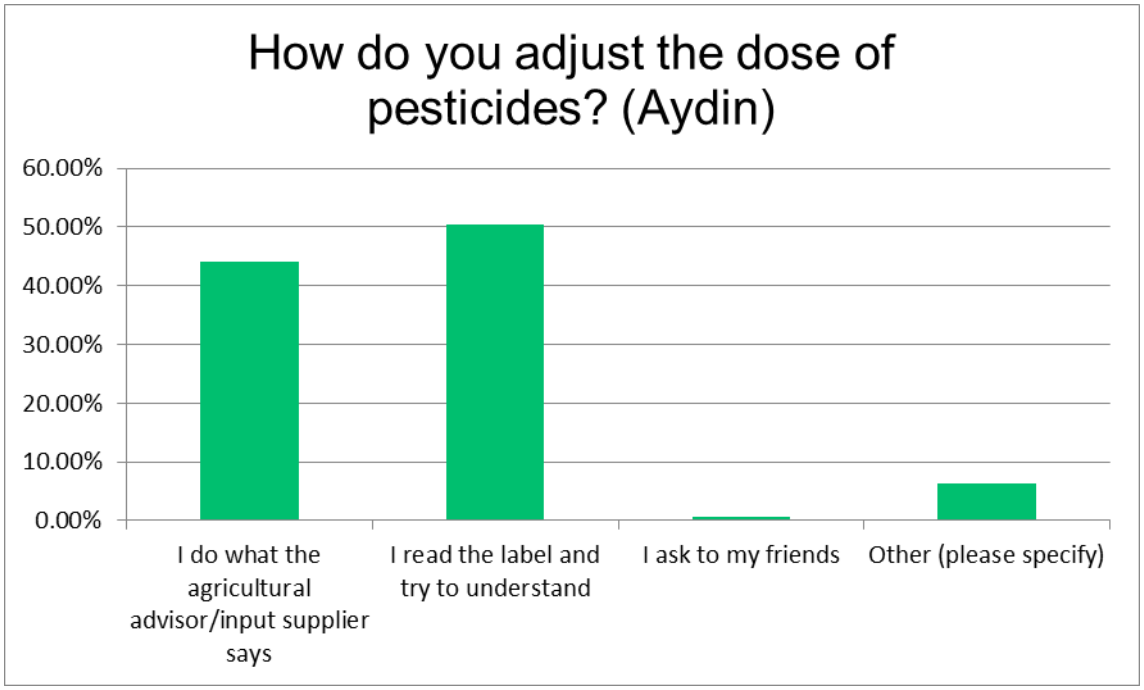


2.6. How do you adjust the dose of pesticides?

The majority of the producers in Izmir and Manisa are dependent on input suppliers and agricultural consultants regarding the use of pesticides. Almost all farmers receive advice from these persons to adjust pesticide doses and make their applications through their suggestions. However, the rate of those who read pesticide labels is also at a significant level.

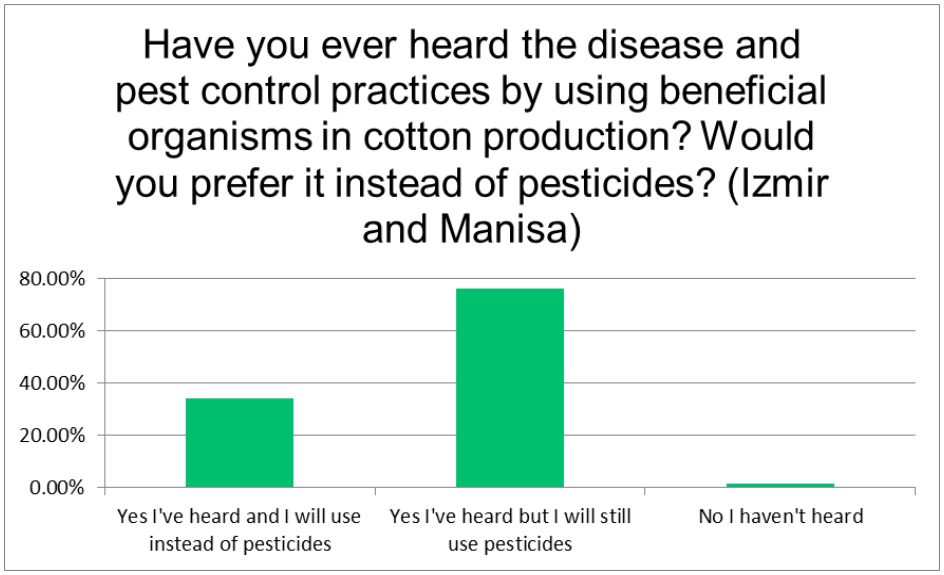


In Aydın province, the majority of the producers are less dependent on the input suppliers and the agricultural advisors. Most of the farmers in Aydin read the labels of pesticide and make their applications. This indicates that the farmers in this province have a high level of awareness and knowledge on pesticides. Unlike other regions; the rate of "other" answer is also noteworthy. Almost all of the farmers who selected "other" choice stated as they made dose adjustments according to their own experiences. However, it should be evaluated whether these methods are correct or not.



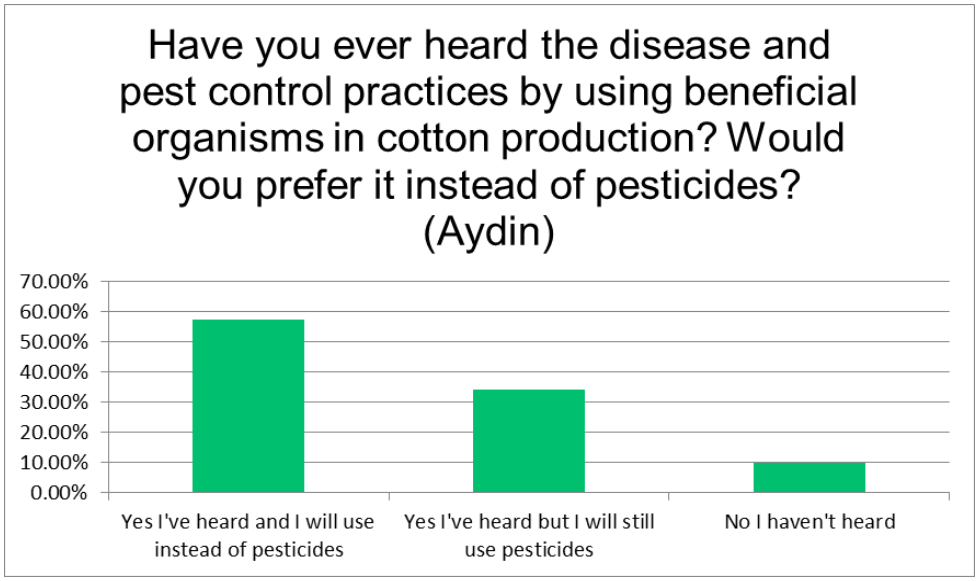
2.7. Have you ever heard the disease and pest control practices by using beneficial organisms in cotton production? Would you prefer it instead of pesticides?

It is identified that the farmers in İzmir and Manisa have a knowledge on biological pest and disease control methods. However, they prefer not use these methods instead of pesticides. Therefore, the benefits of these applications must be demonstrated to farmers through intensive extension activities and demonstrations to change their habits.



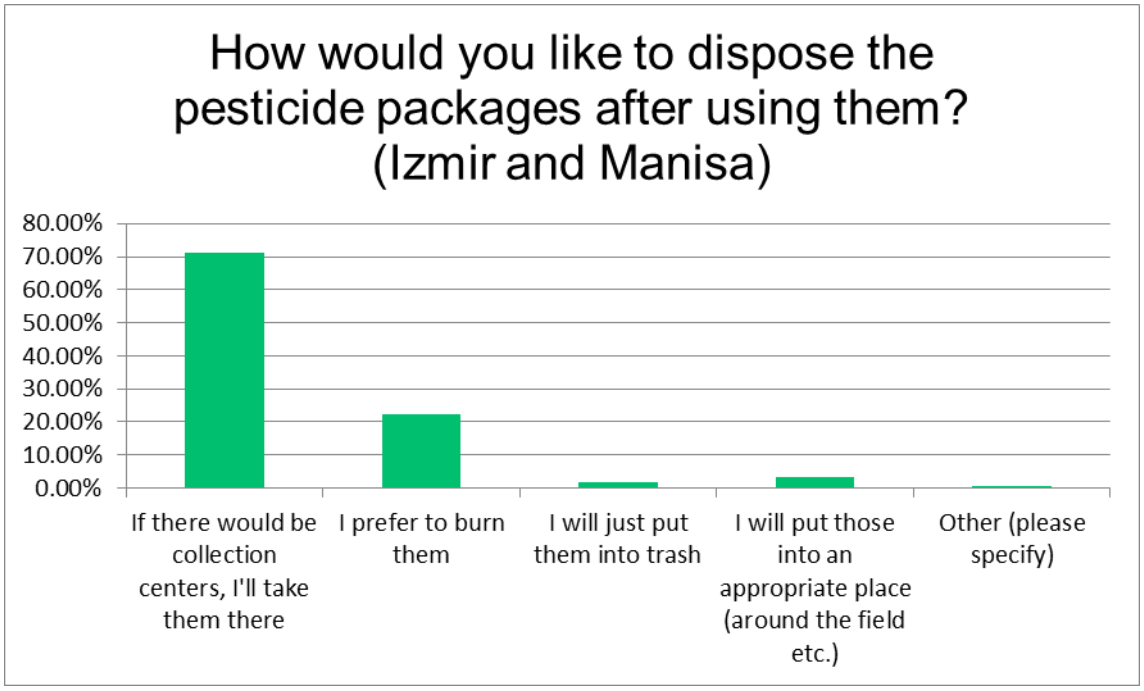
Unlike İzmir and Manisa, the producers in Aydın are open to biological plant protection methods other than pesticides,

and the rate of resistance against biological control agents is relatively low. Thus, it is necessary to make the right guidance to farmers for these methods, since they are open to these methods.



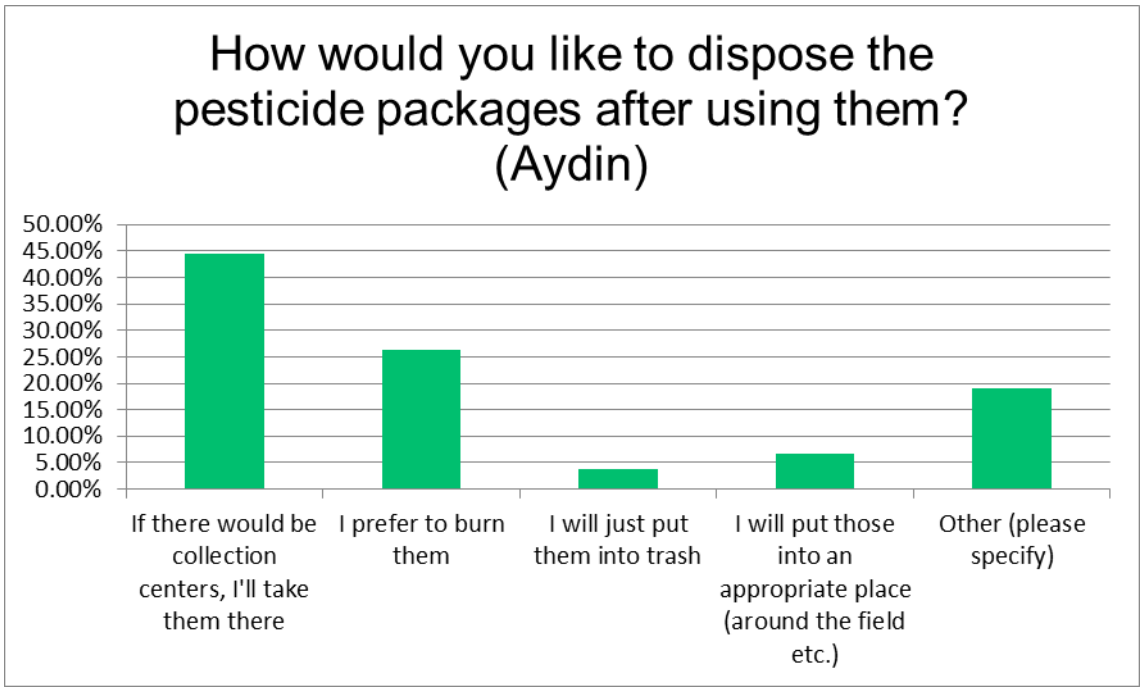
2.8. How would you like to dispose the pesticide packages after using them?

Regarding the disposal of pesticide packages, a significant portion of the producers in Izmir and Manisa have a high level of awareness. More than 70% of the producers in these provinces stated they would take their pesticide waste to the appropriate places if there will be a collection centre. However, still, more than 20% of the farmers prefer to perform the wrong methods such as burning those. Thus, it is necessary to focus on this issue and investigate the presence of infrastructure and possible improvements in the region.



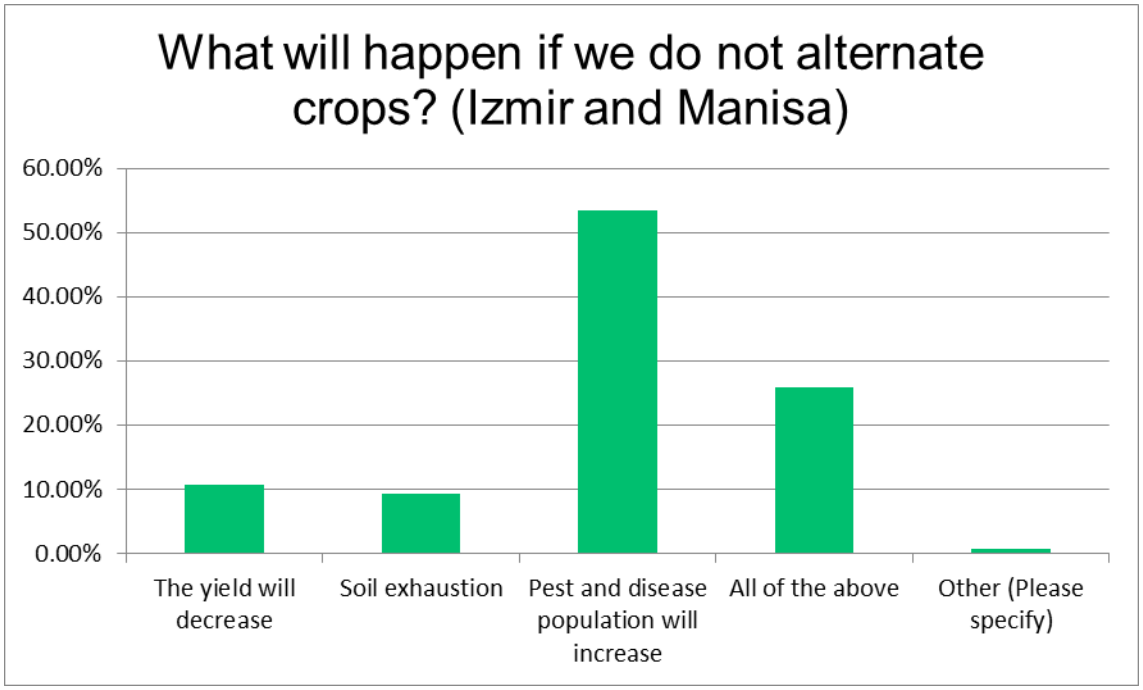
Similar results were also obtained in Aydın province. Most of the producers gave "if a collection centre is found I will dispose of the pesticide packages to this facility" answer. The number of participants give "other" response in this

question seems highly interesting. It is determined that an irrigation union in the region has an infrastructure for pesticide disposals and they are working very active for that. Almost all of the producers select "other" response use collection points of this irrigation union, this situation clearly shows the awareness in this region.



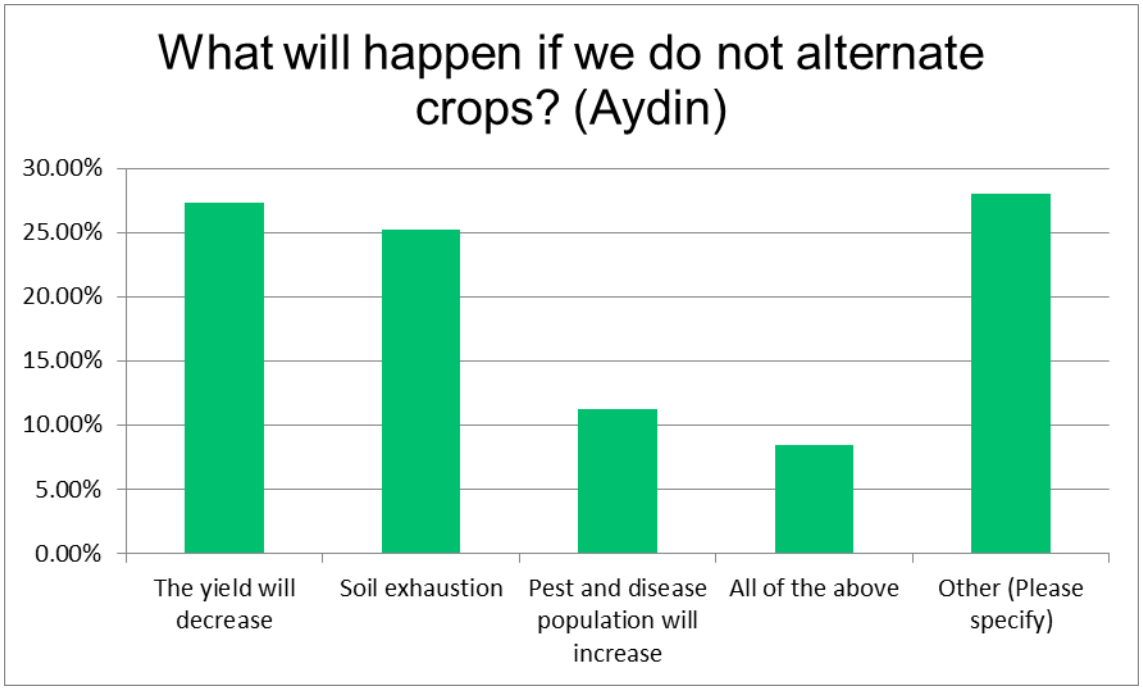
2.9. What will happen if we do not alternate crops?

In the question of the necessity of alternation, it was determined that the producers in İzmir and Manisa generally have awareness. Producers' knowledge in these provinces is also considerably high.



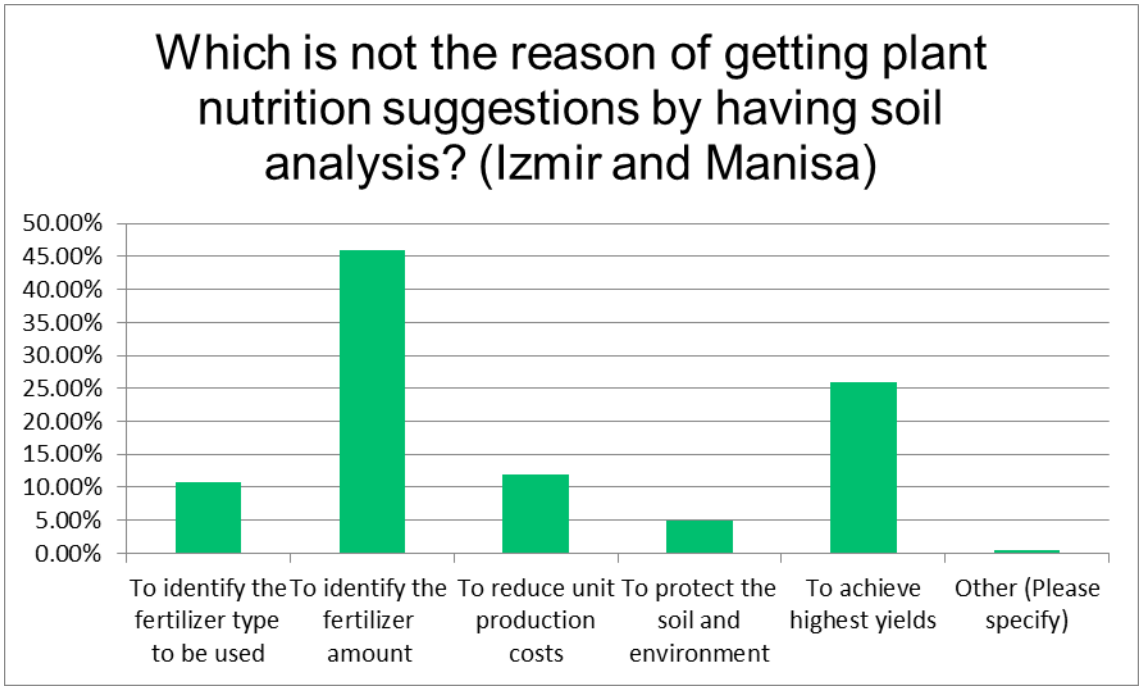
In Aydın province similar results were obtained. However, the most interesting point in this question is the farmers select "other" option. When the details of this answer are examined, it is seen that almost all of the

producers selected this option tells nothing will happen and they alternate only to get benefit from the government supports. This result shows us the improvement of awareness in this region has a great importance.



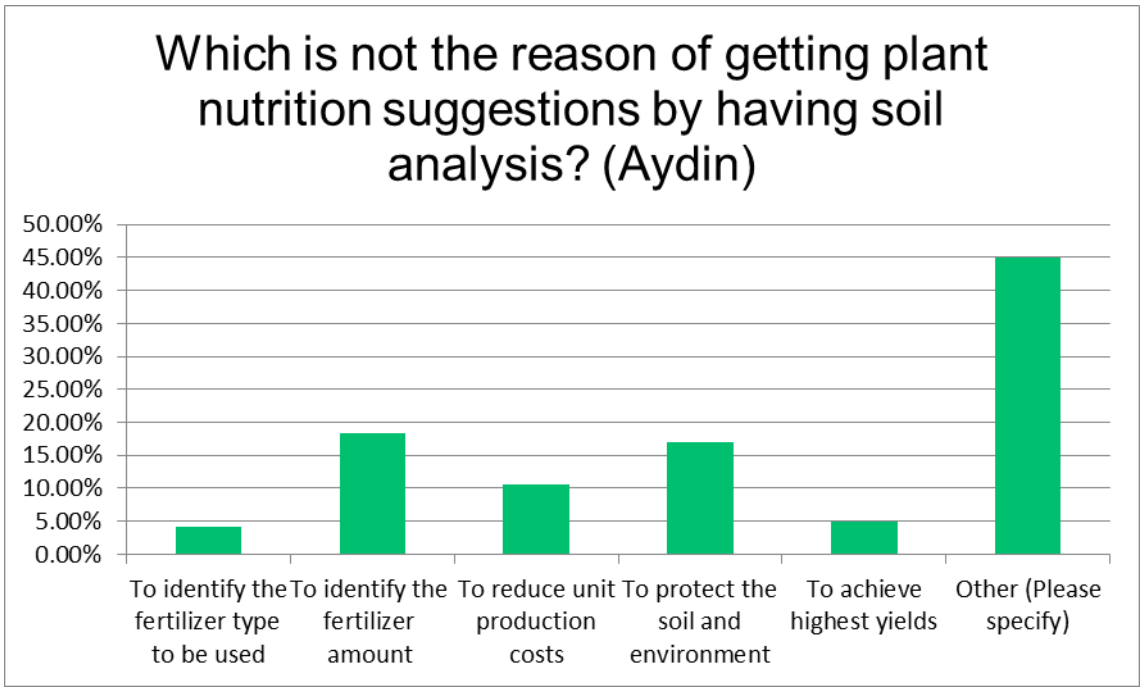
2.10. Which is not the reason of getting plant nutrition suggestions by having soil analysis?

In Izmir and Manisa provinces, there is an error due to misunderstanding this question, and it cannot be evaluated correctly. The producers in this region understood the question as what will be the reason for having soil analysis and selected the correct reasons.



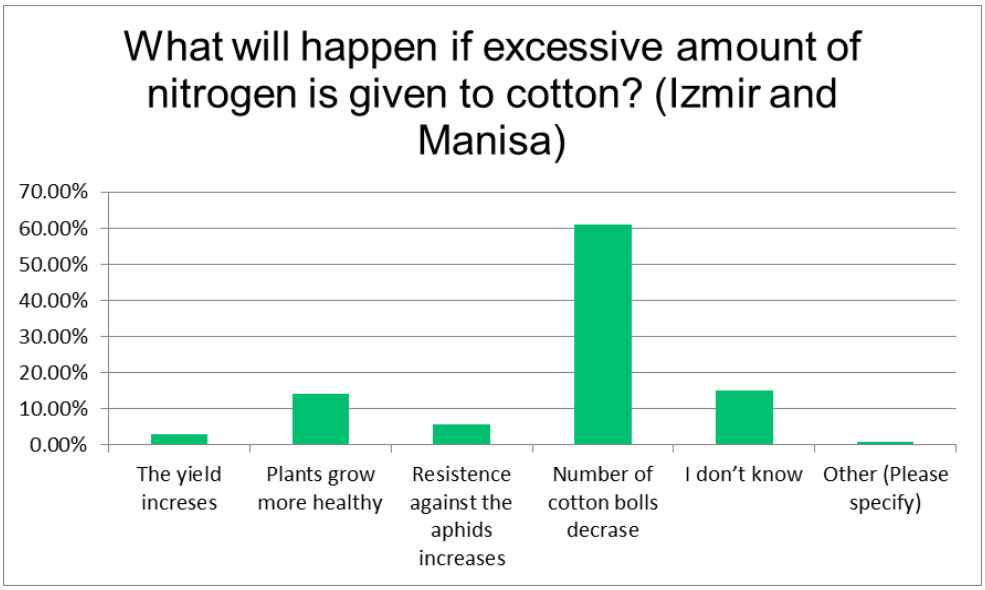
In contrast to the other region, producers in Aydin province was well understood the question. The most of the producers were selected other option as expected and almost all of the producers gave correct answers. In this

context, it can be said that the awareness of soil analysis is relatively high in Aydin province. But, as it can be seen on the answers on the "other" option, majority of the producers were also stated they do not trust the results of soil analyses. For this reason, activities related to soil analyses shall be made on extension activities to increase producers' awareness on the correct results.



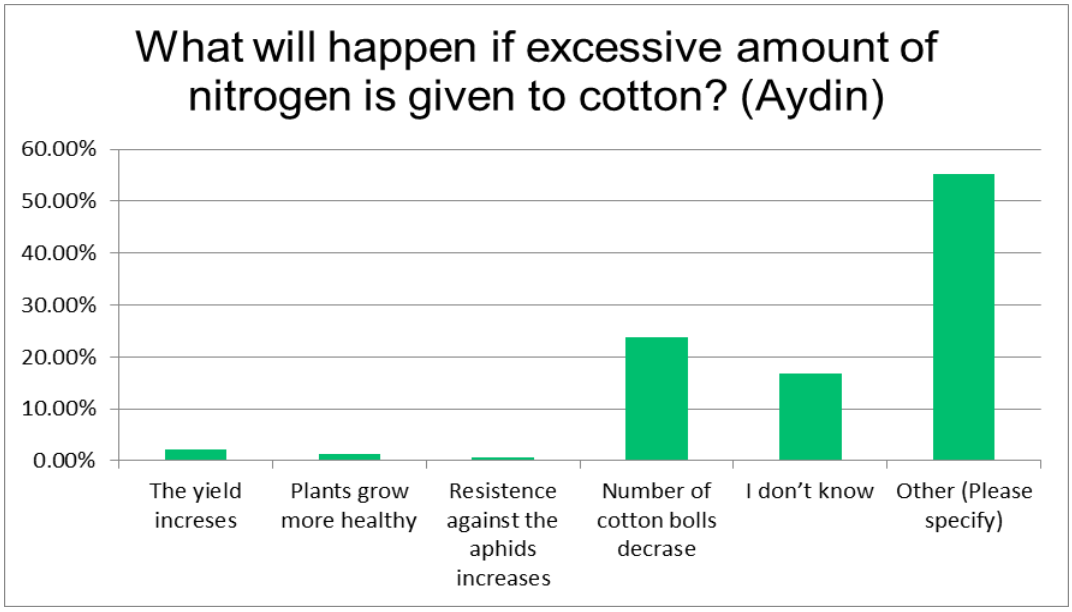
2.11. What will happen if excessive amount of nitrogen is given to cotton?

In Izmir and Manisa provinces, 60% of the producers are aware of the harmful effects of excessive nitrogen use and the importance of balanced fertilisation. However, the remaining 40% is of a size that cannot be ignored and the awareness level of farmers must be increased on these topics.



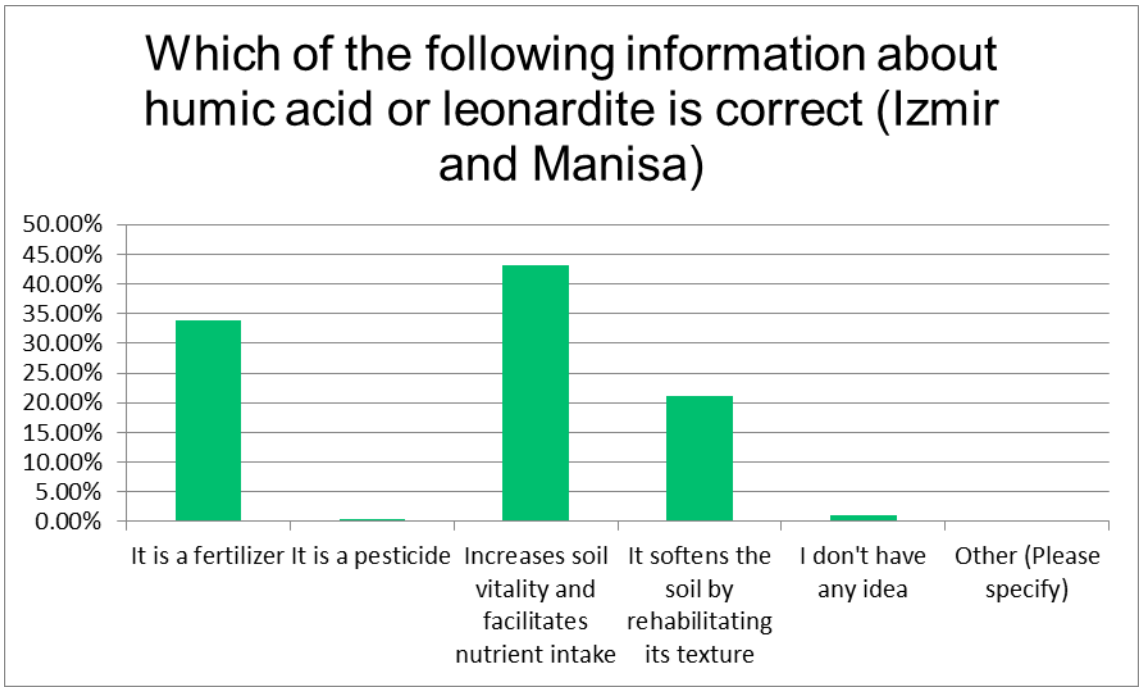
In Aydın province, the other option ranks first for this question. When the given answers to this option analysed, almost all of the farmers give answers related to lower yields and they are highly aware on the damages caused by

the excess nitrogen fertilisation. However, nearly 30% of the population had no or wrong information about the subjects. Thus, the farmers' awareness level should be increased through extension activities.

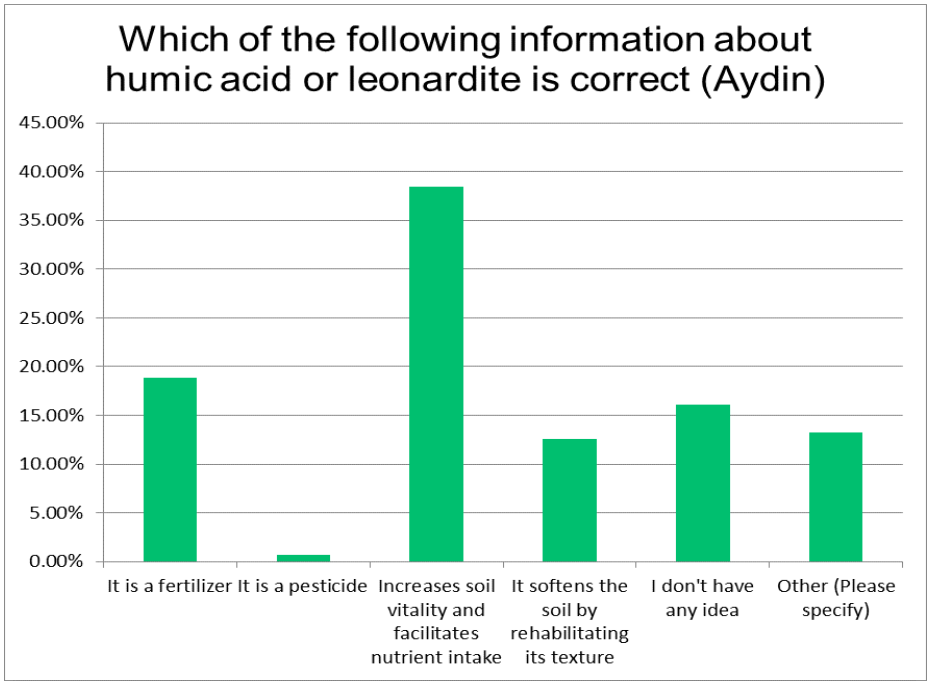


2.12. Which of the following information about humic acid or leonardite is correct?

It is seen that most of the farmers in Izmir and Manisa have an excellent knowledge of soil conditioners. However, this information is limited to these substances' particular benefits, and farmers must be aware of the other benefits of these applications.

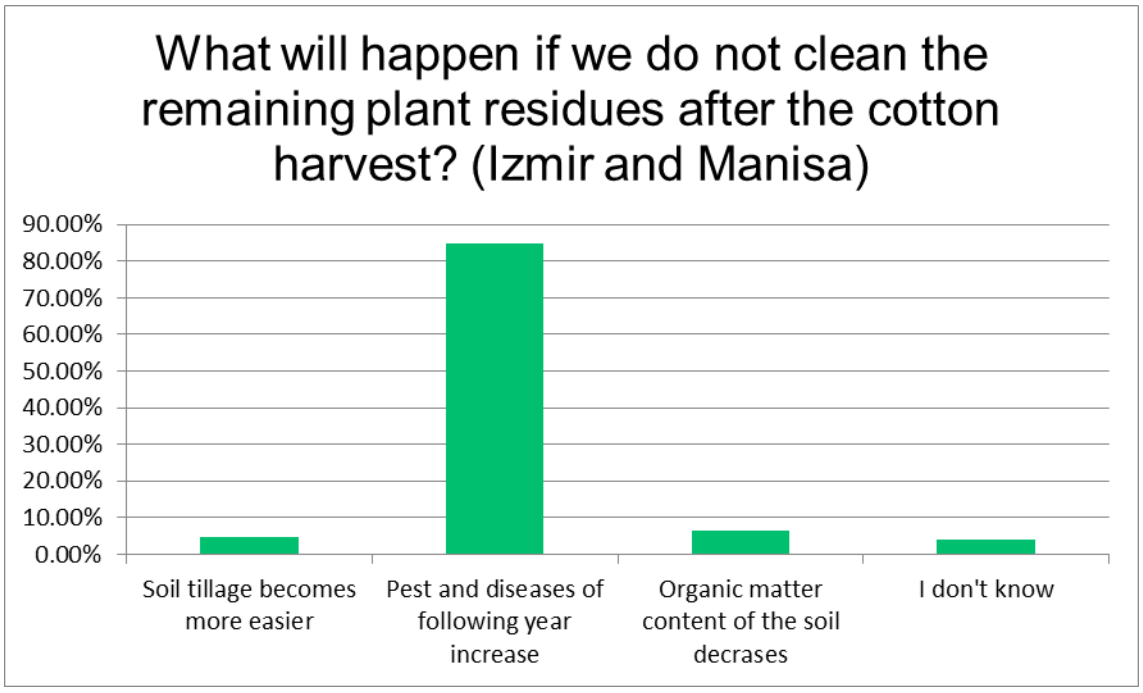


A significant part of the farmers in Aydın also know the soil conditioners. 65% of the producers gave correct answer to provided options and to open ended answers in "other" option. However, approximately 35% of the producers have false or no knowledge on these substances and activities related to raising awareness on the soil conditioners shall be made.

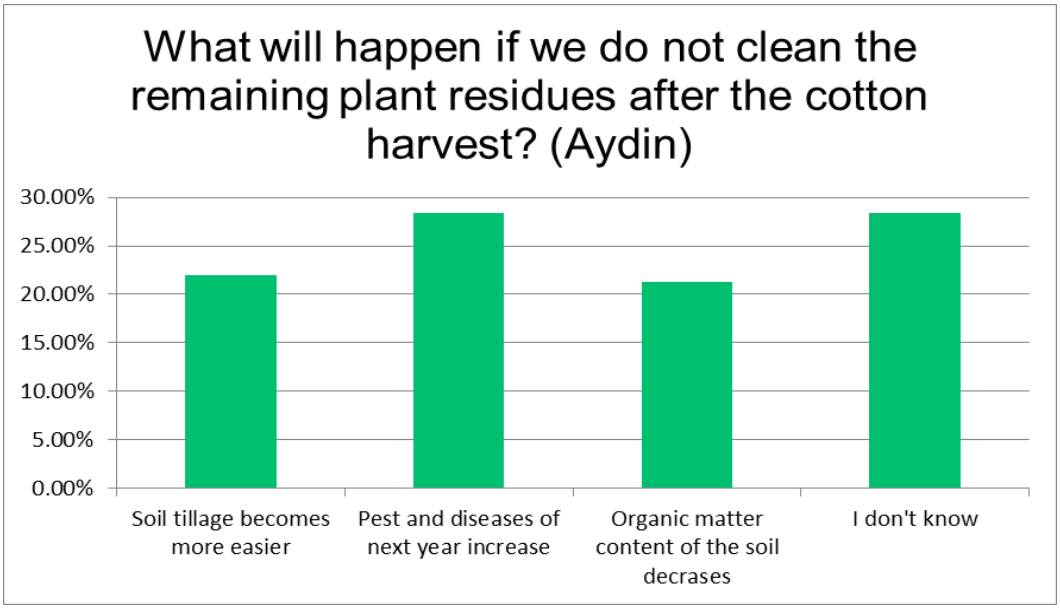


2.13. What will happen if we do not clean the remaining plant residues after the cotton harvest?

The awareness of cleaning plant residues is relatively high in Manisa and Izmir provinces. For this reason, this issue should be addressed during the training, but it is not necessary to give an important focus.



Unlike İzmir and Manisa, a significant part of the producers they have the wrong information on this topc. Thus, it is necessary to give a special focus o then cleaning plant residues in training. But, an energy company generates energy by collecting post-harvest plant residues from the field in Söke and this could be the reason of the low knowledge levels on this topic. But in any case, the farmers awareness on this issue might be increased.



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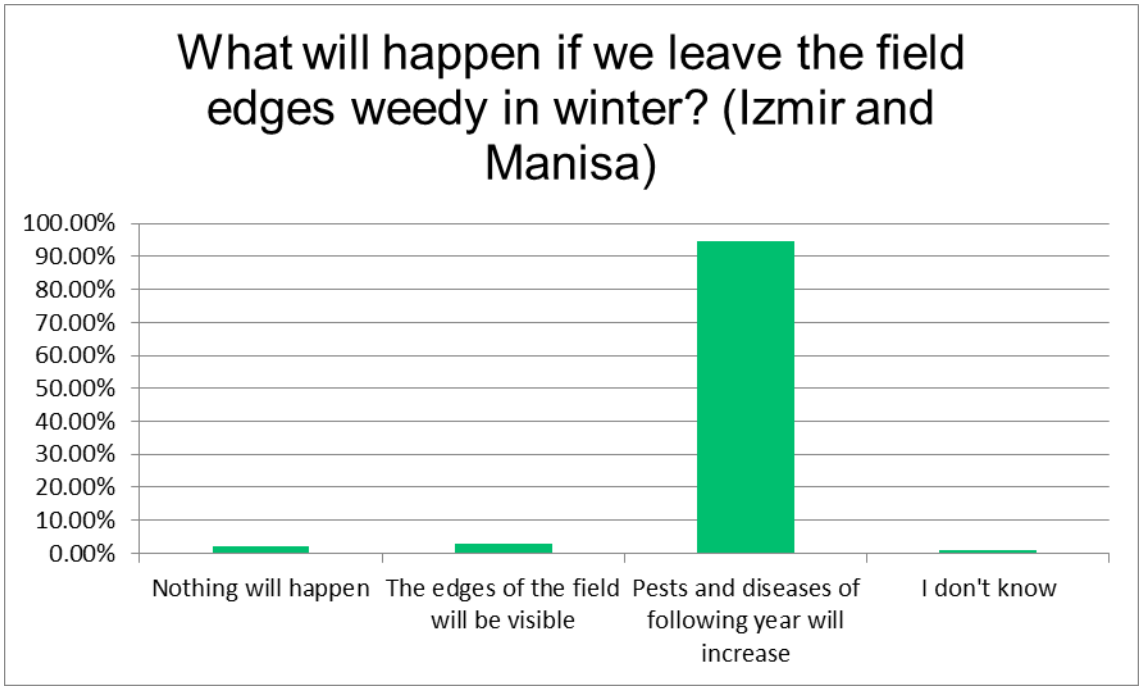
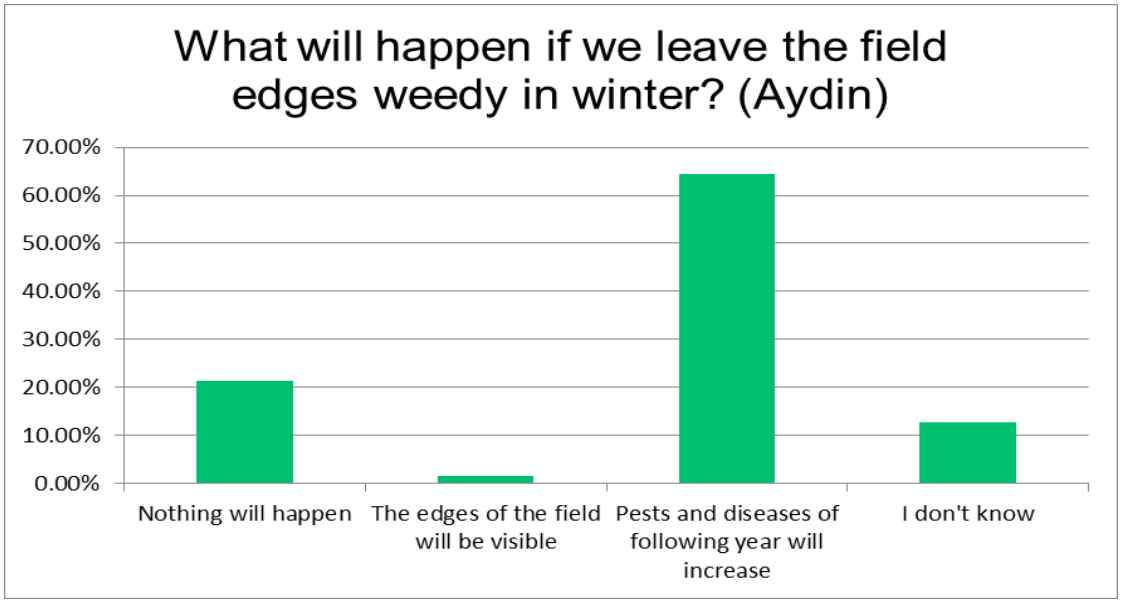
2.14. What will happen if we leave the field edges weedy in winter?

The answers given to this question, reveals the high awareness among farmers in Izmir and Manisa. For this reason, even though this topic will be included in the training materials, a particular focus shall not be given for trainings in Izmir and Manisa.

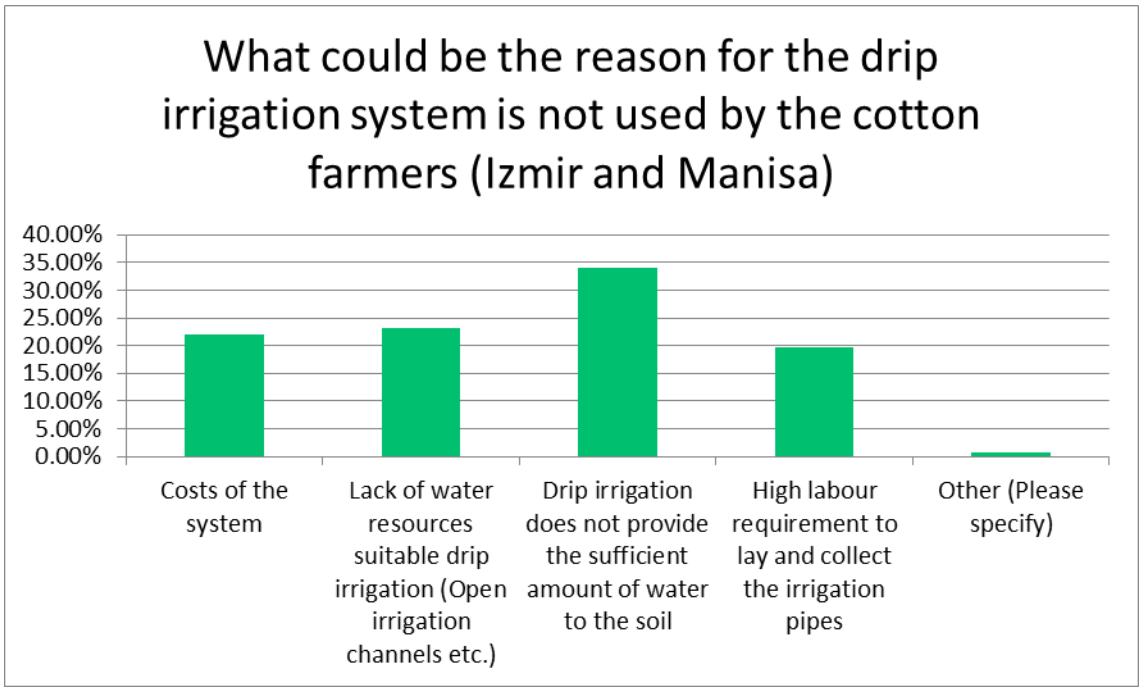


Contrarty to answers given in Izmir and Manisa, it is determined that the farmers' awareness level on this topic in Aydın is relatively low. Only 63% of the producers select the correct option about the topic, and the remaining 37% do not have any knowledge or have false information. Unlike İzmir and Manisa, a special focus should be given in the farmer trainings of Aydin province.



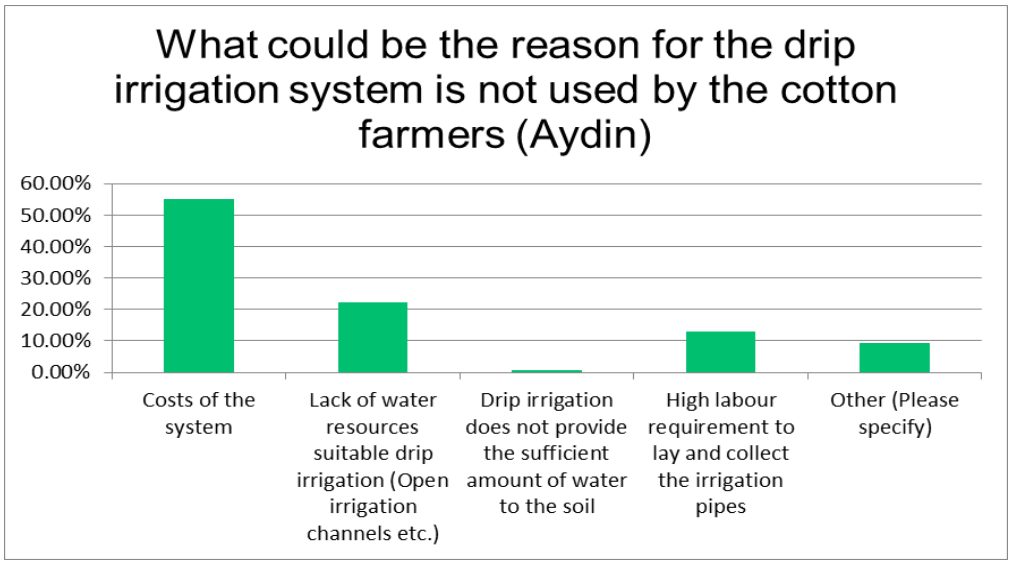
2.15. What could be the reason for the drip irrigation system is not used by the cotton farmers?

In this question, different answers were obtained from İzmir and Manisa provinces. Most of the producers in Izmir and Manisa believe the drip irrigation does not provide sufficient amount of water to the soil. The second answer given by most of the producers was the lack of suitable infrastructure for pressurized irriganion system. The costs of drip irrigation systems ranked third and high labour requirement ranked 4th in this question. In this regard, İzmir and Manisa farmers should be informed about the benefit of these methods and the mistakes known correct during the trainings and pilots.



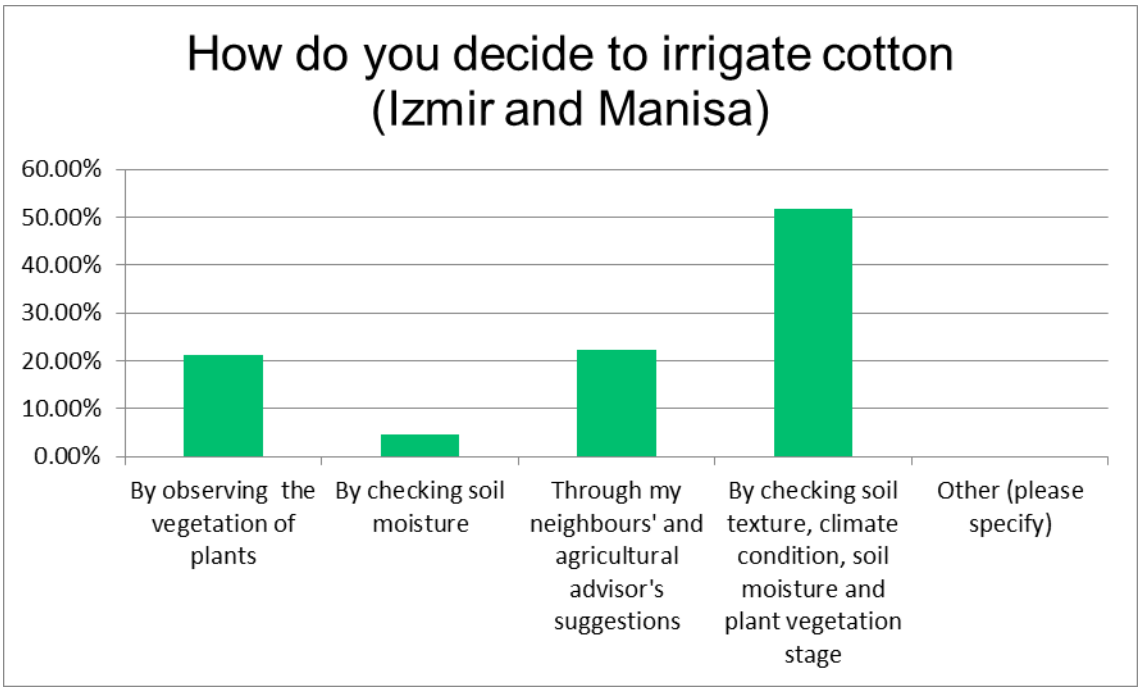
In the Aydın province, the cost of the irrigations systems ranks first and its followed by the lack of suitable infrastructure in the region. In addition to this, "other" option selected by significant amount of producers in this region. Almost all of the farmers who gave this answer stated that drip irrigation could not be used in the region

because of the lack of proper infrastructure. By considering these asnwers, the economic side of the pressurised irrigation systems and its impacts on the operating costs shall be given in the farmer trainings. Also, the alternative and less water consuming methods of flood irrigation shall be introduced in the places where the irrigation infrastructure is not suitable.



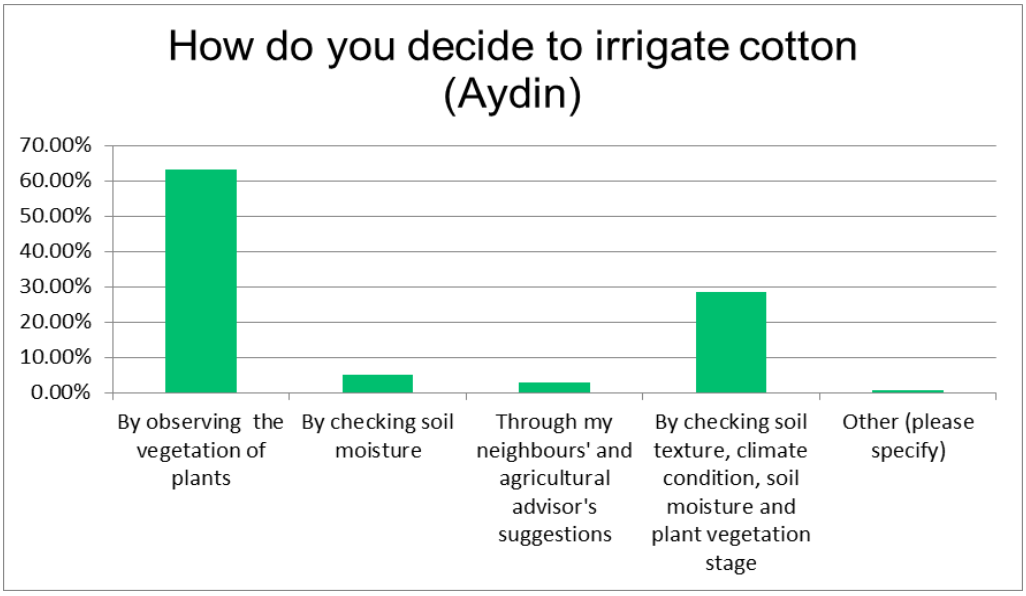
2.16. How do you decide to irrigate cotton?

The question determined that the farmers' awareness level in Izmir and Manisa is relatively high, and 52% of them use right methods. However, it is seen that the number of farmers who use incorrect techniques by rote methods is at almost similar levels. Thus, it is necessary to introduce cotton-soil-water-climate relations accurately and explain the correct irrigation decision methods.



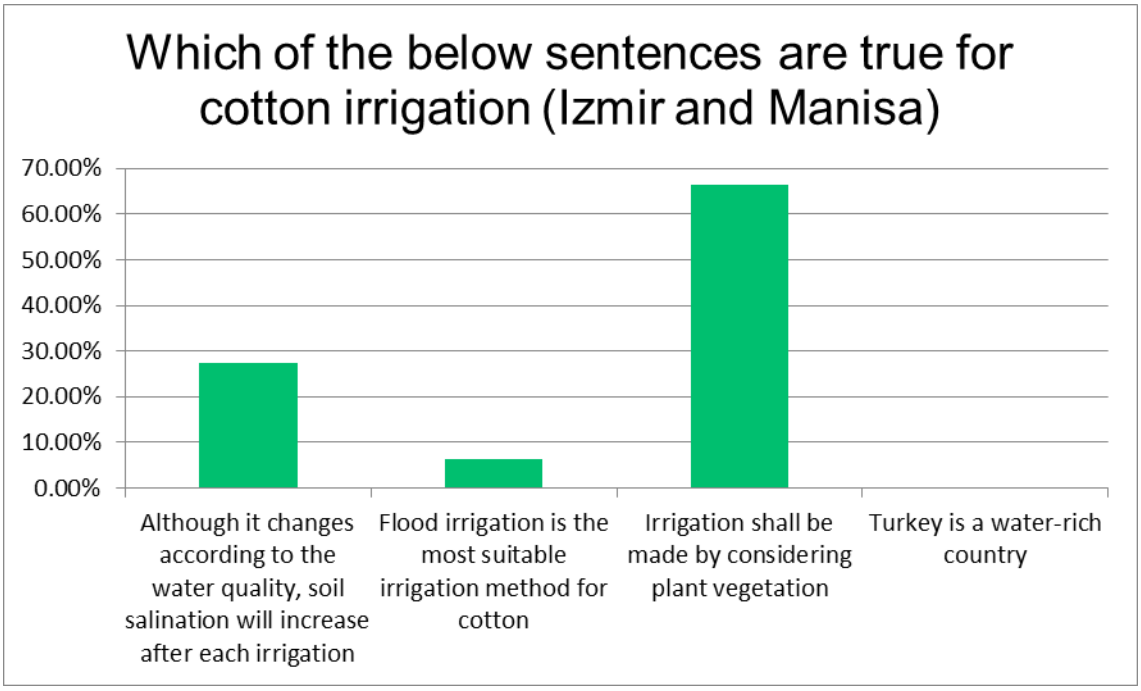
In Aydin province, only 33% of the producers have correct information on irrigation decision, and 67% of the producers decide to irrigate their field by rote methods. For this reason, it is of great importance to have a focus on cotton-soil-

water-climate relations and the correct techniques in making irrigation decisions, similar to Izmir and Manisa.

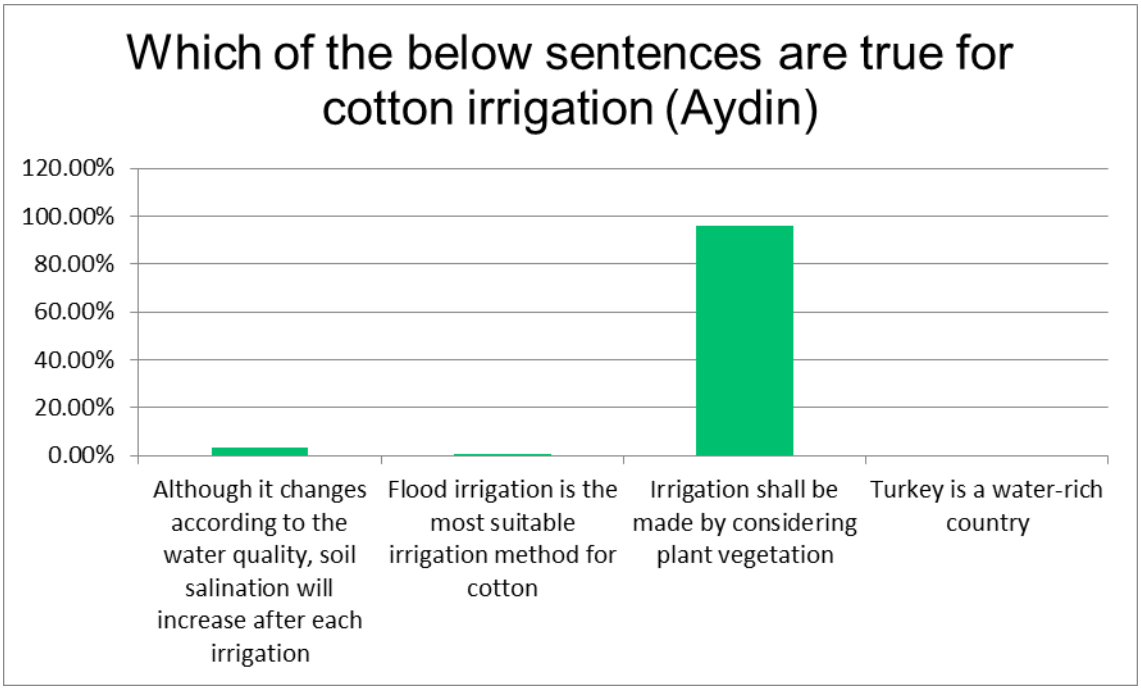


2.17. Which of the below sentences are true for cotton irrigation?

The last question asked to the producers in the survey aims to validate the previous irrigation questions and measure the general awareness on the irrigation. Within this context, it is observed that only 28% of the farmers in İzmir and Manisa provinces have a general awareness of irrigation. 66% of the farmers gave wrong answer as "the irrigation shall be done by considering plant vegetation". Furthermore, 6% of the farmers have almost no awareness of the irrigation topics since they stated the flood irrigation is the most suitable method for cotton.



On the other hand, the results obtained in the province of Aydın were different from the other region. It was observed that 99% of the producers are using rote techniques on the irrigation decision. According to these results, detailed awareness-raising activities like training and demonstration should be made on irrigation topic in both regions.



3. Conclusion

As a result of this survey, the farmers' correct and wrong practices were determined for each important production topics in line with the BCI principles. This collected information will be used in the training materials and will be of great importance in other activities of the project such as pilots, designing continuous improvement plans etc. These results show that, the knowledge levels of farmers in two different regions vary considerably. For this reason, focused topics in the training and other activities must be different for both areas. In addition, the producers' knowledge level on specific issues was much higher than expectations. But, they have been struggling to transfer this knowledge into the practice.

Annexe 5 - Preliminary pilot subjects

1- Main Pilot Subject

Integrated pest management against the aphids and red spider mites in cotton

Sub-topics

- Alternative methods to pesticides, bait plants, home-made natural pesticides;
- The correct reading of pesticide labels, cleaning and maintenance of sprayers, personal protective equipment usage instructions. Informative plates are designed and placed related to these topics within a commonplace in a village; pesticide disposal containers are placed in this location. Developing an evaluation questionnaire to measure farmers' awareness before and one year after preparing this place.
- Selection of seed varieties with high ginning yield and resistance against the pest and diseases;
- Monitoring of the population of pests and natural predators;

2- Main Pilot Subject

Açık kanalet ile sulama suyu temin edilen alanlarda sızdırma yöntemi veya bölgeye uygun diğer yöntemler ile salma sulamaya göre pamuğun su tüketim karşılatırması yapılması / bölgede kapalı sistem mevcut ise, basınçlı sulama yöntemlerinin denemesi.

Comparing the water usage between flood irrigation, leakage method or other suitable surface irrigation method in the areas where irrigation water is provided through open irrigation channels / testing pressurised irrigation methods if there is a closed system water transfer infrastructure in the region.

Sub-topics

- Identification of required irrigation water and irrigation timing through using Crop-Wat software and comparison of yields and water footprints;
- Measurement of used water use through physical and mechanical methods;
- Measurement of soil moisture and used irrigation water amount

3- Main Pilot Subject

Comparison of reduced and traditional tillage methods.

Sub-topics

- Identification of correct fertiliser type and optimum amounts according to physical and chemical characteristics of the soil, climate parameters, variety characteristics and needs of the cotton and fertilisation of the crops in the correct time
- In low and medium level soils with low organic matter content, analysis of humic acid applications to the soil before germination and to the leaves after germination on the yield and fertiliser use.

4- Main Pilot Subject

Rehabilitation of a degraded area for cotton production, activities to enhance biodiversity

5- Main Pilot Subject

Identification of effective defoliant application methods (spraying time, correct spraying machine, selection of spraying sprouts)

Sub-topics

- Selection of seed varieties with high ginning yield and resistance against the pest and diseases;
- Field cleaning
- Contamination and monitoring of fibre quality