MODULE 15 - ECO-FRIENDLY AGRICULTURE

OBJECTIVES

After the study of this e content module the learner will be able to:

1. Explain the eco-friendly agriculture in the present day context.
2. Describe problems due to chemical fertilizers and pesticides.
3. Define eco-friendly crop production.
4. Explain cropping system approach.
5. Explain plant protection management.
6. Explain soil and water management.
7. Explain integrated nutrient management.
8. Describe low cost production technology.
9. Describe role of organic farming in eco-friendly agriculture.
10. Define social and environmental sustainability.

SUMMARY

Eco-friendly agriculture is an attempt to produce agricultural products without damaging the quality of environmental components. It includes mainly sustainable use of resources, plant protection management, soil and water management and integrated nutrient management.

TRANSCRIPTION

Introduction

Do you know that at present our country requires over 200 million tones of food grains to feed its huge population? By the year 2020 we will need about 294 million tones of grains, which will be about 94 millions tones in addition to the present one. This additional food grains will have to be produced from the same area of agricultural land which is available today. Now it's a big challenge before the scientists and agriculturists of the country to increase production efficiency of land and reduce the production cost.

Problems due to chemical fertilizers and pesticides

For providing the sufficient food to the rapidly increasing population various measures have been adopted by the farmers. They are using the chemical fertilizers and pesticides to get the huge output from the crops. But these results are for short term as the benefits from these chemical fertilizers and pesticides are not effective for longer term. The fertility of agricultural land and nutrients of food grains and vegetables are being deteriorated because of the excess use of pesticides and fertilizers. The detrimental effects are also being seen on the human health .They contaminate the land and underground water which is very harmful for eco-system.

Now we are facing two problems. One, the production of required food grains to feed the huge population of the country and two protection of the environment. The eco friendly agriculture is the only solution of these two problems.

Eco- friendly crop production

An integrated approach to cropping systems management through the application of results of scientific researches may be a way for sustainable use of resources. Sincere efforts are needed on balance fertilization and integrated nutrient supply systems involving organic manure, bio fertilizers crop residue, proper cropping systems approach , weed pest disease management, low cost technology, post harvest technology, crop produce technology , social and environmental sustainability etc. to adopt proper resource management for eco friendly crop production.

Sustainable crop production

The sustainable crop production requires cropping system approach, plant protection management, soil and water management, and integrated nutrient management.

1. Cropping system approach

Today, we have a need to change the traditional cropping system, which is followed by the farmers in different states or regions of the country. Due to traditional cropping approach crop yields have either declined or now sustained.
In some states like Punjab, cropping system is to be diversified and intensified through value added crops or vegetables or medicinal crops etc. To increase profit margin and also to meet the national larger goals. In some regions of the country for example at Pantnagar maize-potato-maize sequence is better for potato tuber yield as compared to maize-potato-moong sequence.

2. Plant protection management

To meet out the national goal with respect to grain productivity, we are required to protect crops from weeds, pests and diseases. Now-a-days, the losses due to weeds in crop yields are estimated up to 31.5 percent. On an average 10 percent reduction appears in the crop yields. Therefore, we need to adopt proper protection measures to control the losses in crop yields. Several pre and post emergence weedicides are available now a day with the formers. Integrated waste management is an effective approach for controlling pastes. The use neem oil is one of the successful remedies in this regard.

3. Soil and water management

The most important aspect in present day agriculture in India is soil and water resource conservation. The non-agricultural sectors are increasing day by day and are utilizing huge quantity of water. This shifted trend is reducing the share percent of water in agriculture. To bring out the maximum crop yield with limited water resources has become the need of the day. Now we can use several new techniques like drip micro

sprinklers, micro jet and low head bubbdler irrigation. They are the effective tools for scientific management of water resources.

4. Integrated nutrient management

The ultimate objective of nutrient management is to use all the major sources of plant nutrients such as fertilizers, minerals, organics and biological sources in an integrated manner. This leads to attain maximum economic yield without any bad effect on soil properties or ecological balance. Green manures, waste crop residues etc. appears to be quite beneficial in sustainable agriculture.

Low cost production technology

Because day by day, the cost of inputs like fertilizers, seeds, herbicides weedicides, Irrigation etc. are increasing therefore the necessity of low cost production technology is emerging in present day agriculture. The role of allopathy in the control of weeds, diseases, pests etc. is being recognized by agricultural scientists. Allopathy is a low cost production technology where a biochemical interaction between all types of plants including microorganisms takes place. This covers both detrimental and beneficial reciprocal biochemical interactions. Date of sowing, zero tillage, planting geometry, spacing, seed rates growth regulators, planting techniques etc. are low coast technologies.

Organic farming / Bio-farming

Now-a-days the heavy use of pesticides, weedicides and other chemicals in agriculture is resulting bad effects on human health. Therefore we should use organic farming which is also known as BIO-FARMING .Some of the organics like compost, green manure , cakes, and bio-fertilizers like rhizobium culture, azotobactor ,Azospirillum ,blue green algae etc . are beneficial in present day agriculture .The atmospheric air contains 78.4% nitrogen which can be fixed by bacterial culture. With the use of rhizobium culture in pulses 2-65 % yield increases. 7-72 % of increase can takes place by Azotobacter. Nearly 20-30 kg nitrogen per hectare can be fixed by culture Azotobacter or Azospirullum or rhizobium.

Crop quality and post harvest technologies

It is also important to maintain the quality of crops. For this post harvest technologies should be adopted. Some regions have developed several post harvest techniques like in ladakh which is a cold arid region .They use solar dehydration technique for tomatoes. Some other examples are extension of shelf life for post harvest storage of custard apple, nutritional quality of methi seed in grain storage.

Social and environmental sustainability

Only eco-friendly crop production is not enough but sustainable culture management of sodic soil is also required through agro forestry system. Such as use of Azolla as integrated nutrient management of saline soil. Woman can also play an important role in social forestry, resource management which is a major issue in present day agriculture.

Conclusion

Hunger and food insecurity are the current problems before the country. If unsustainable agricultural practices remain in use then scarcity of resources could soon become a major factor in food insecurity. Today the essential component in agriculture is to go for high yield by proper resource management and making agriculture eco-friendly. By this only we can save our environment and human health.

GLOSSARY

Eco-friendly: Any practice which is not creating any bad effect on any component of the environment.

Agriculture: Cultivation of crops for the production of food grains, vegetables etc.

Environmental sustainability: Maintenance of environmental quality.

Cropping systems: Crop rotation system.

Weeds: Naturally grown plants in the crop fields.

FAQs

1. What type of challenge our country has in relation to food grains?

Ans. our country requires over 200 million tones of food grains to feed its huge population? By the year 2020 we will need about 294 million tones of grains, which will be about 94 millions tones in addition to the present one. This additional food grains will have to be produced from the same area of agricultural land which is available today. Now it's a big challenge before the scientists and agriculturists of the country to increase production efficiency of land and reduce the production cost.

2. What are the problems emerged because of excessive use of fertilizers & pesticides?

Ans. The fertility of agricultural land and nutrients of food grains and vegetables are being deteriorated because of the excess use of pesticides and fertilizers. The detrimental effects are also being seen on the human health .They contaminate the land and underground water which is very harmful for eco-system.

3. What is eco-friendly crop production?

Ans. An integrated approach to cropping systems management through the application of results of scientific researches may be a way for sustainable use of resources. Sincere efforts are needed on balance fertilization and integrated nutrient supply systems involving organic manure, bio fertilizers crop residue, proper cropping systems approach , weed pest disease management, low cost technology, post harvest technology, crop produce technology , social and environmental sustainability etc. to adopt proper resource management for eco friendly crop production.

4. Describe plant protection management?

Ans. To meet out the national goal with respect to grain productivity, we are required to protect crops from weeds, pests and diseases. Now-a-days, the losses due to weeds in crop yields are estimated up to 31.5 percent. On an average 10 percent reduction appears in the crop yields. Therefore, we need to adopt proper protection measures to control the losses in crop yields. Several pre and post emergence weedicides are available now a day with the formers.

5. Why there is a need of soil and water management?

Ans. The most important aspect in present day agriculture in India is soil and water resource conservation. The non-agricultural sectors are increasing day by day and are utilizing huge quantity of water. This shifted trend is reducing the share percent of water in agriculture. To bring out the maximum crop yield with limited water resources has become the need of the day. Now we can use several new techniques like drip micro sprinklers, micro jet and low head bubbdler irrigation. They are the effective tools for scientific management of water resources.

6. Why integrated nutrient management is helpful in eco-friendly agriculture?

Ans. The ultimate objective of nutrient management is to use all the major sources of plant nutrients such as fertilizers, minerals, organics and biological sources in an integrated manner. This leads to attain maximum economic yield without any bad effect on soil properties or ecological balance. Green manures, waste crop residues etc. appears to be quite beneficial in sustainable agriculture.

7. What is allopathy?

Ans. Allopathy is a low cost production technology where a biochemical interaction between all types of plants including microorganisms takes place. This covers both detrimental and beneficial reciprocal biochemical interactions. Date of sowing, zero tillage, planting geometry, spacing, seed rates growth regulators, planting techniques etc. are low coast technologies.

8. Describe organic farming.

Ans. Now-a-days the heavy use of pesticides, weedicides and other chemicals in agriculture is resulting bad effects on human health. Therefore we should use organic farming which is also known as BIO-FARMING .Some of the organics like compost, green manure , cakes, and bio-fertilizers like rhizobium culture, azotobactor ,Azospirillum ,blue green algae etc . are beneficial in present day agriculture .

9. What type of relationship is there between women & eco-friendly agriculture?

Ans. Only eco-friendly crop production is not enough but sustainable culture management of sodic soil is also required through agro forestry system. Such as use of Azolla as integrated nutrient management of saline soil . Woman can also play an important role in social forestry, resource management which is a major issue in present day agriculture.

10. What are the benefits of eco-friendly agriculture?

Ans : a. We can save our environment.
b. Human health can be maintained.