

Unit 5



Intercultural Operations in Paddy

INTRODUCTION

Intercultural operations are performed during seed sowing, crop growth and harvesting for better aeration and weed management. Weeding, fertiliser application, mulching, etc., are the basic activities of intercultural operations. Machinery and implements used for the purpose are called 'intercultural equipment'.

The major objective of intercultural operations is to minimise weed population. Generally, crop-weed competition occurs for moisture, nutrients, light and space. Weed competition causes yield loss in paddy, which may range from 10 to 90 per cent. Direct seeded and transplanted rice are the two major methods of paddy cultivation. Intercultural operations are more crucial for Direct Seeded Rice (DSR) as compared to transplanted rice. In fact, weeds are partially suppressed due to puddling and anaerobic or flooded conditions in case of transplanted rice. Thus, intercultural operations become important for managing weeds, providing aeration and maintaining regular crop geometry in paddy cultivation.



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INTERCULTURAL OPERATIONS DURING SOWING AND PLANTING

Intercultural operations for Direct Seeded Rice (DSR)

Many people, especially, in rural areas of the country, are shifting from agriculture to other sectors. As a result, there is scarcity of labourers and those available are costly for paddy transplanting. Besides, the depleting water level and environmental factors have made farmers adopt dry or DSR method. If machinery is locally available, both big and small farmers can easily adopt DSR method. Diversified weed flora is found in DSR cultivated area due to alternate wetting and drying. It reduces the yield considerably, if not controlled in time.

Stale seedbed technique

Stale seedbed technique is important, where weed seed bank is diversified. In this technique, weeds are facilitated to germinate and encouraged to grow. One to two irrigations are required for the germination of weed seeds before two to four weeks of sowing. After the germinated weeds attain a certain growth, tillage or non-selective herbicide is used to kill the weeds.

Physical practices

Removing weeds by hand (manually) or by machine (mechanically) come under physical practices. Labour scarcity limits hand weeding. Besides, it is costly. However, one or two rounds of hand weeding, along with herbicide application, are required to control weed population. Mechanical weeding is being widely used as it reduces the labour costs and does not cause damage to the crop as no chemical is used. Rotary weeder with motor and other hand weeders are used to remove weeds, particularly, in the DSR system.

Intercultural operations for transplanted rice

Intercultural operations are carried out by different methods. The selection of a method depends on the



availability of labour, time, money and implements. It also depends on soil moisture and agro ecosystems.

NOTES

Manual weeding

In manual weeding, the weeds are uprooted manually or by hand-operated equipment. In this operation, the soil surface is opened and pulverised. Hand weeding must be done at the tillering stage, i.e., 20–25 days after transplanting. Maintaining 5-cm water depth continuously from the rooting stage till 15–20 days before harvesting will keep weed growth in check. It also improves aeration and oxygen supply to the roots. The operation, however, is labour and cost intensive.

Mechanical weeding

Mechanical weeding is carried out in transplanted rice or DSR between rows. A hand-operated rotary weeder is used to carry out the weeding operation when the transplants are 15–20 days' old. This operation is repeated at an interval of 10–15 days till the panicle initiation stage. The equipment helps to cut and bury the weeds. The soil also gets pulverised up to a depth of 10–15 cm, which results in favourable soil conditions for the growth and development of roots, and increased number of tillers.

Intercultural operation in SRI

In SRI method, a conoweeder is used to control weed population. Conoweeder operation is a two-directional intercultural operation. It is easy to operate, where plant-to-plant and row-to-row distance is the same (square planting). A conoweeder must be used 10 days after transplanting. It helps the paddy crop in the following ways.

- Trampling and ploughing of weeds add nutrients to the soil.
- Frequent operation in the soil disturbs and buries the weeds, and facilitates aeration for decomposition, which improves soil health.
- The use of a conoweeder helps prune roots, which lead to increased number of tillers.
- Its use reduces the weeding cost.



Intercultural operations in *biasi* rice

Biasi (beushening) is used for direct seeded lowland rice in Odisha, Chhattisgarh and Jharkhand and to some extent in West Bengal, Assam and Uttar Pradesh. *Biasi* is used to control weed population and optimise crop stand. This cultivation constitutes 80 per cent of the total rice area of Chhattisgarh. *Biasi* is an intercultural operation, which is done in a direct seeded paddy field by ploughing the area with a local wooden plough and *trifal* cultivator in standing water condition. It means that the crop is ploughed at a depth of 10–15 cm for 30–40 days after sowing, and then, planking or *chalai* is done. In *chalai*, the uprooted seedlings of paddy plants are manually planted in the same place or in gaps to maintain the plant population, and the weeds are buried in the soil by feet. Planking is, then, done to level the furrow, in which the weeds are suppressed into the mud and the paddy plants get established.

Practical Exercise

Activity 1

Demonstrate manual weeding in a paddy field.

Material required: *khurpi*, hand hoe, gumboot, gloves, etc.

Procedure

- Visit a paddy field.
- Identify common weeds present in the field.
- Identify the various tools used to carry out manual weeding.
- Remove the weeds manually.
- Observe the weed population after 15 days.
- Prepare a herbarium file consisting of the weed samples.
- Present your observations before the class.

Activity 2

Demonstrate mechanical weeding.

Material required: rotary weeder, gumboot, gloves, notebook, pen, pencil, etc.



Procedure

- Visit a nearby paddy field.
- Identify the common weeds found in the field.
- Use a rotary weeder to remove the weeds.
- Observe weed population in the field after 15 days.
- Note down your observations in a notebook and present it before the class.

Check Your Progress**A. Fill in the Blanks**

1. _____ operation in paddy plant is performed from sowing to harvesting.
2. The implements used for carrying out various intercultural operations are known as _____ equipment.
3. Intercultural operations are more crucial for _____ rice.
4. In _____ technique, weed seeds are allowed to germinate, and are then, killed.
5. Intercultural operation improves _____.
6. Hand weeding in paddy crop must be done after _____ days of transplanting.

B. Multiple Choice Questions

1. _____ herbicides are used in stale seedbed technique.
 (a) Selective (b) Non-selective
 (c) Systemic (d) Non-systemic
2. *In biasi* practice, intercultural operation is done in _____.
 (a) standing water (b) dry field
 (c) moist field (d) None of the above
3. Diversified weed flora are found in _____.
 (a) transplanted rice (b) DSR
 (c) SRI (d) nursery
4. Conoweeder operation is a _____-directional intercultural operation
 (a) one (b) two
 (c) three (d) four



NOTES

C. Match the Columns

A	B
1. Square planting	(a) Manual weeding
2. Weeding equipment in SRI	(b) <i>Trifal</i> cultivator
3. Cost and labour intensive	(c) SRI
4. <i>Biasi</i> (beushening) equipment	(d) Conoweeder

D. Subjective Questions

1. Describe intercultural operations carried out in direct seeded rice.
2. Write about the intercultural operations performed in *biasi* rice.
3. Explain stale seedbed technique.

