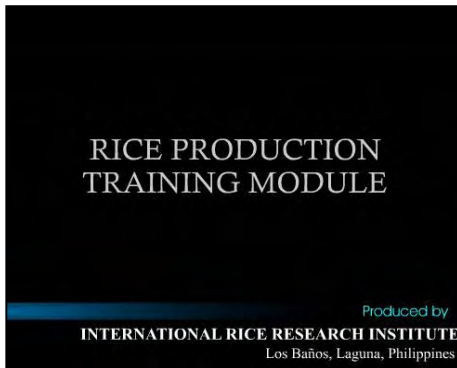
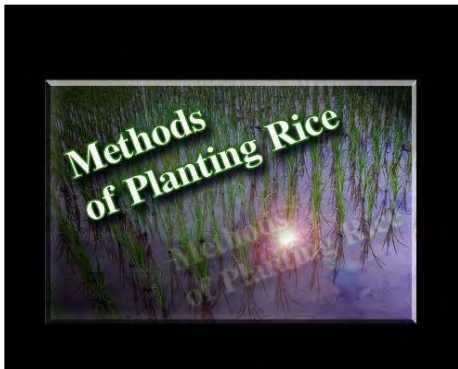


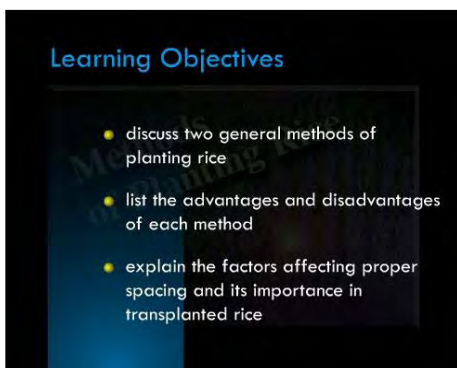
Methods of Planting Rice



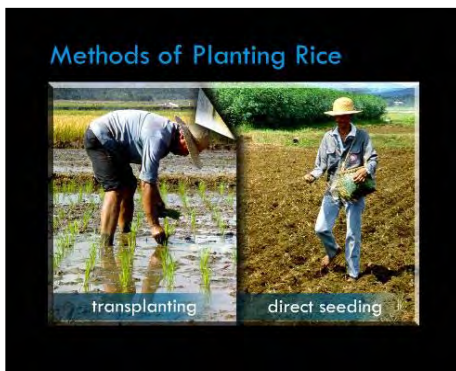
- 1 This is one of the rice production training modules produced by the International Rice Research Institute.



- 2 This module is on the methods of planting rice.



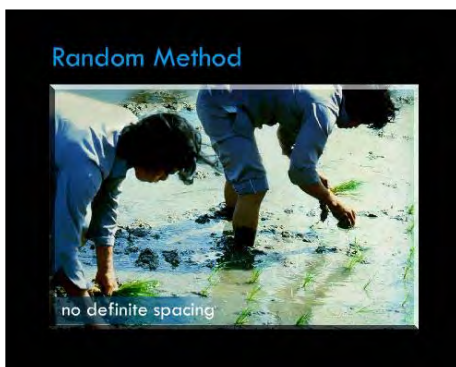
- 3 At the end of this lesson, you will be able to
- discuss two general methods of planting rice.
 - list the advantages and disadvantages of each method, and
 - explain the factors affecting proper spacing and its importance in transplanted rice.



- 4 There are two methods for planting rice: **transplanting** and **direct seeding**.



- 5 Seedlings are prepared by any of the three methods described in Methods of Raising Seedlings. The seedlings are now ready for transplanting in the field. Transplanting is done in one of two methods: **random** or **straight-row**.



- 6 In the random method, seedlings are transplanted without a definite distance or space between plants as you can see in this frame.



- 7 The straight-row method follows a uniform spacing between plants. The seedlings are transplanted in straight rows.

Straight-row Method



- 8 You will need planting guides to have uniform spacing. Planting guides are made of wire, twine, and wood. Set the planting guides in the field before transplanting.

Straight-row Method



- 9 In this method, make sure the roots and base of the seedlings are inserted into the soil right under the loop or mark on the planting wire.

Straight-row Method



- 10 After planting one row of seedlings, move the guides to the next row and then continue planting. Move backward for each subsequent row.

Transplanting



- 11 Plant the wetbed seedlings at a depth between one and a half to three centimeters. The dapog seedlings are planted at one and a half centimeters deep or just deep enough for the roots to come in contact with the soil.

Straight-row Method



- 12 The wooden marker is also used to transplant in straight rows. Mark the rows with a wooden marker of desired width and with the teeth spaced at twenty or twenty-five centimeters.

Pull the marker straight along the length of the field and then pull it again perpendicular to the first markings.

Straight-row Method



- 13 Plant the seedlings where the lines intersect.

Straight-row Method



- 14 You can also use another method of transplanting in straight rows: mechanical or machine transplanter.

Transplanting



- 15 The Methods of Raising Seedlings module describes raising seedlings for mechanical or machine transplanting.

Transplanting



- 16 When the whole area is planted, place the extra seedlings in small bundles along the levee. Use them later for replanting missed hills within ten days after transplanting.

Keep the water level at about one centimeter until the plants recover in three to four days. If there are problems such as golden apple snail infestation, keep the soil saturated but without standing water.

Straight-row Method

Advantages

- facilitate management practices
- optimum spacing

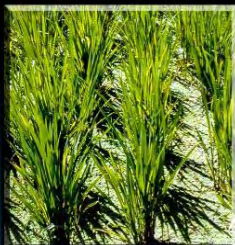


- 17 Earlier, we say that we can plant the seedlings at random or at a uniform spacing. Note the advantages of straight-row planting. Straight rows facilitate management practices such as hand or rotary weeding and application of fertilizers, herbicides, or insecticides. Most importantly, we achieve optimal plant spacing.

Optimum Spacing

Factors

- variety
- season
- soil fertility



- 18 Optimal spacing is dependent on variety, season, and soil fertility. No single type of spacing is best for all varieties.

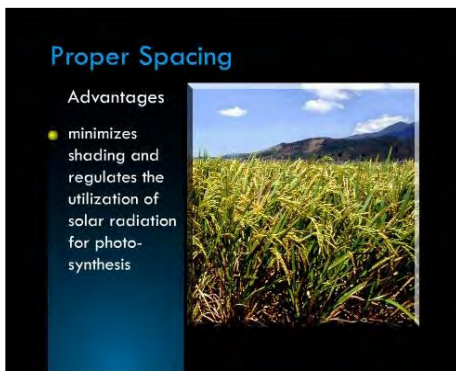
Proper Spacing

Advantages

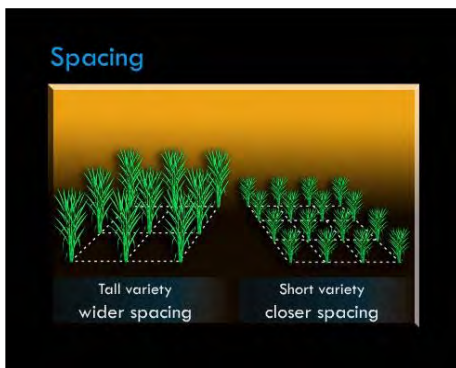
- increases yield by 25 - 39 %
- saves money on inputs, labor, and materials



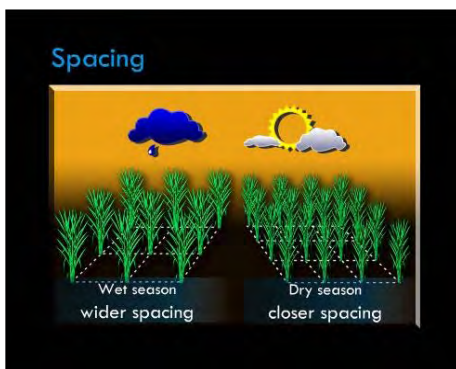
- 19 Plant spacing is an important factor in transplanting rice. Proper spacing can increase the yield by twenty-five to thirty-nine percent over improper spacing. With proper spacing you can save money on inputs, labor, and materials.



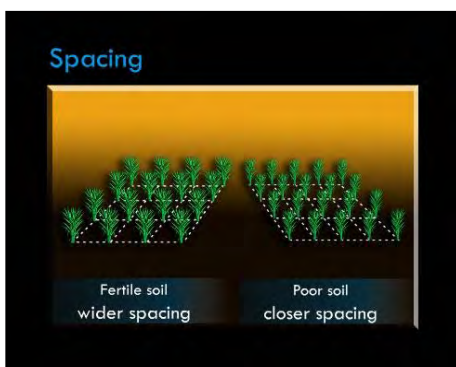
- 20 Proper spacing can increase grain yield. It minimizes shading and regulates the utilization of solar radiation for photosynthesis.



- 21 Variety is the first factor that determines plant spacing. Regardless of the season, tall, leafy, heavy tillering, and susceptible to lodging rice varieties should be placed farther apart than short, lodging-resistant, and photoperiod-insensitive varieties.



- 22 Season is the second factor. Plant the seedlings closer during the dry months, when solar radiation is higher, than during the rainy or wet season. Plants become more vegetative during the wet season. This increases mutual shading.



- 23 Soil fertility is the third factor. Plant the seedlings farther apart in fertile soil and closer in poor soil. Distance prevents mutual shading in fertile soil, while plants grown in poor soil tend to have tillers, thus, they can be planted closer together.

Spacing



- 24 With the factors contributing to good yields, we can state that tall, leafy, heavy-tillering varieties are spaced:

During the dry season: twenty-five by twenty-five centimeters in relatively poor soil, thirty by thirty centimeters in fertile soil.

During the wet season: thirty by thirty centimeters in relatively poor soil, thirty-five by thirty-five centimeters in fertile soil.

Spacing



- 25 Place the short, lodging resistant, and photoperiod-insensitive varieties at twenty by twenty centimeters regardless of season. However, desirable spacing in less fertile soils must be at twenty by fifteen centimeters or twenty by ten centimeters.

Direct Seeding



- 26 The other method of growing rice is by direct seeding. In this method, we will focus on direct seeding rice with dry land preparation.

Direct Seeding



- 27 There are three techniques of direct seeding

1. broadcasting
2. drilling
3. dibbling

Broadcasting (80-100 kg seeds/ha)



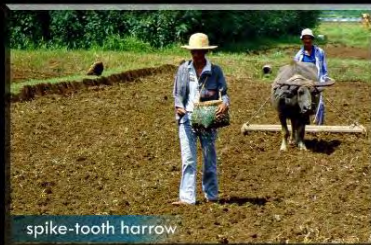
- 28 You can broadcast eighty to one hundred kilograms of seeds per hectare uniformly on the field or in furrows in a one-hectare field.

Broadcasting



- 29 Make shallow furrows by passing a furrower along the prepared field.

Broadcasting



- 30 After broadcasting, cover the seeds using a spike-tooth harrow.

Drilling (80-100 kg seeds/ha)



- 31 Another technique is drilling eighty to one hundred kilograms of seed per hectare by hand on prepared furrows, or by seed drillers.

Dibbling



- 32 The third technique is dibbling, or hill planting. This is usually practiced along mountain slopes or where plowing and harrowing are difficult. Use a long wood or bamboo pole with a metal scoop attached at the end for digging holes. Then drop the seeds into the holes and cover them with soil.

Direct Seeding



- 33 We will now discuss the direct seeding methods for wetland preparation.

Direct Seeding



- 34 The method of direct seeding on a wet field is through broadcasting, or drilling seeds into the mud.

Broadcasting (80-100 kg seeds/ha)



- 35 In this method, broadcast the pregerminated seeds (soaked for twenty four hours and incubated for forty-eight hours) by hand at eighty to one hundred kilograms per hectare. Seeds for the mechanical or machine seeder are incubated for only twenty-four hours.

Direct Seeding



- 36 Seeding a field with standing clear water is also practiced in developed countries. This practice is usually conducted with the aid of an airplane.

Direct Seeding

Advantages

- requires less labor
- plants mature earlier



- 37 There are two advantages to using direct seeding:

1. It requires less labor. You do not have to prepare the seedbed, care for, and pull the seedlings.
2. Direct-seeded plants mature seven to ten days earlier than transplanted rice. They are not subjected to stress such as being pulled from the soil and reestablishing fine rootlets.

Direct Seeding

Disadvantages

- seeds are exposed to birds, rats, and snails
- greater crop-weed competition



- 38 However, it also has disadvantages:

1. In direct seeding, the seeds are exposed to birds, rats, and snails.
2. There is greater crop-weed competition because rice plants and weeds are of similar age.

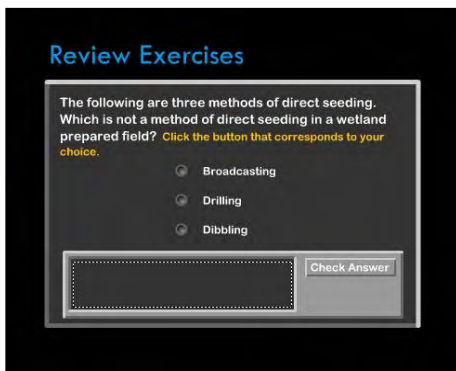
Direct Seeding

Disadvantages

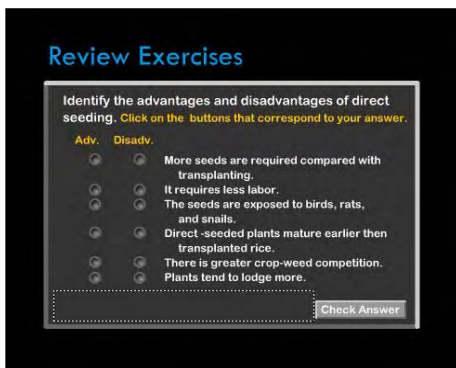
- plants tend to lodge more
- more seeds are required



- 39
3. Plants tend to lodge more because there is less root anchorage.
 4. More seeds are required, eighty to one hundred kilograms per hectare compared with thirty-five to sixty-five kilograms per hectare required for transplanting.



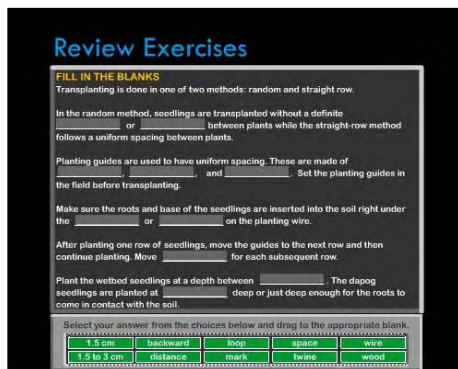
40 Before we end this lesson, let us answer the following.



41 Identify the advantages and disadvantages of direct seeding. Click the buttons that correspond to your answer.

ADV DISADV

- ☐ ☐ More seeds are required: eighty to one hundred kilograms per hectare, compared with thirty-five to sixty-five kilogram per hectare required for transplanting.
- ☐ ☐ It requires less labor.
- ☐ ☐ The seeds are exposed to birds, rats, and snails.
- ☐ ☐ Direct-seeded plants mature seven to ten days earlier than transplanted rice.
- ☐ ☐ There is greater crop-weed competition because rice plants and weeds are of similar age.
- ☐ ☐ Plants tend to lodge more because there is less root anchorage.



42 Complete the statements by dragging the missing words to the appropriate blanks.

Transplanting is done in one of two methods: random and straight row.

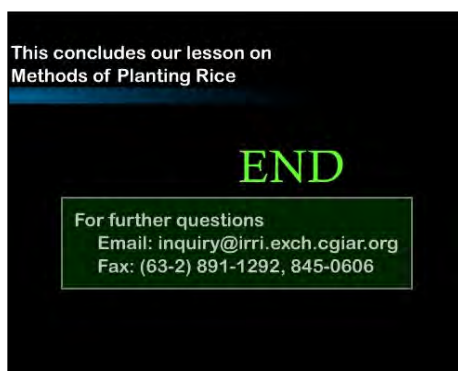
In the random method, seedlings are transplanted without a definite _____ or _____ between plants while the straight-row method follows a uniform spacing between plants.

Planting guides are used to have uniform spacing. These are made of _____, _____, and _____. Set the planting guides in the field before transplanting.

Make sure the roots and base of the seedlings are inserted into the soil right under the _____ or _____ on the planting wire.

After planting one row of seedlings, move the guides to the next row and then continue planting. Move _____ for each subsequent row.

Plant the wetbed seedlings at a depth between _____. The dapog seedlings are planted at _____ deep or just deep enough for the roots to come in contact with the soil.



This concludes our lesson on Methods of Planting Rice. For further information, email us at inquiry@irri.cgiar.org.

Glossary

Broadcasting	– sowing rice seeds uniformly on the surface of the field by hand.
Dapog Method	– raising seedlings in a seedbed prepared as in the wetbed method, but covered with banana leaves or plastic sheets, or raising seedlings in concrete flooring.
Dibbling	– planting rice seeds in holes made by any pointed implement such as a bamboo or wooden stick. It is usually practiced along sloping or hilly areas.
Direct seedling	– sowing seeds in the field with either dryland or wetland preparation
Drilling	– sowing seeds in rows by hand or drilling machine.
Drybed method	– raising seedlings in a dry seedbed. It is usually practiced in rainfed areas or where irrigation water is not adequate.
Dryland preparation	– plowing and harrowing the field when the soil is dry or below the water saturation level.
Incubation	– setting soaked seeds at room temperature to allow germination.
Lithao	– a local farm implement for making furrows.
Pregerminated seeds	– seeds soaked in water for 24 hours and incubated for 24-48 hours.
Pulling	– uprooting rice seedlings from wetbed or drybed.
Seedbed	– prepared layers of wet or dry soil where rice seeds are grown before transplanting.
Spike-tooth harrow	– a tillage implement used to cover seeds that are broadcast or drilled in furrows.
Transplanting	– planting seedbed-grown seedlings in the field.
Wetbed method	– raising seedlings on seedbed where land is prepared wet and puddled.
Wetland preparation	– plowing and harrowing the field when soil is saturated with water or flooded.

Acknowledgment

CONTENT EXPERTS

1st edition	N. Yapit, R. Obordo, B. Mabbayad, and V. Macalinga
2nd edition	S. Datta

PRODUCTION STAFF

Advisers	P. Marcotte M. Quiamco
Team Leader	O. Garcia
Content Experts, CD Version	O. Garcia R. Rosales
Production coordinator	G. Zarsadias
Editors	E. Hernandez J. Gorsuch
Programmer	E. Azucena
Graphic artist & Photographer	I. Panganiban
Narrator	R. Cruz
Production Assistants	L. Ocampo Jr. L. Atienza