Direct Seeding Method of Rice Cultivation

1. Introduction & Instruction

1.1 Introduction

Rice direct seeding is a modern and innovative method of rice cultivation that deviates from traditional transplanting practices. In this approach, rice seeds are sown directly into the field on the saturated soil, eliminating the need for the labor-intensive process of manually transplanting rice seedlings. This agricultural technique has gained popularity in recent years due to its numerous advantages, including increased efficiency, reduced labor and less water requirements, and improved crop yields.

Rice direct seeding in Timor-Leste were introduced by the domestic rice project in 2021 through the collaboration with The University of Tokyo in Maliana 1 irrigation. So far there was about 80 farmers from Maliana 1 irrigation farmers apply this method. Bellow is prototype of drum seeder that utilized in Maliana 1 irrigation.



1.2 Instruction

Using a rice drum seeder is a straightforward process and a lot of advantage compared to traditional broadcasting system, but it requires careful setup and operation to ensure accurate and efficient planting of rice seeds. Below are step-by-step instructions on how to use a rice drum seeder:

- 1. Soaking and incubate seed as it is for nursery bed. Make sure for drum seeder incubation should be minimum and just at germination stage and not elongated.
- 2. Fill the Seed Hopper: the seed hopper cover and fill it with the prepared rice seeds. Be sure not to overfill it to prevent clogging.
- 3. Position the Seeder: Push or pull the seeder to your planting area. Make sure the seeder is on level ground for consistent seed placement.

- 4. Start Planting: Hold the handle of the seeder and begin walking in a straight line across the field. As you walk, the drum inside the seed hopper will rotate, releasing rice seeds through the seed tubes onto the ground.
- 5. Maintain Even Spacing: Walk at a consistent pace to ensure even seed spacing. The seeder should distribute seeds evenly across the planting row. You may need to practice achieving the desired spacing.
- 6. Turn at the End of Rows: When you reach the end of a row, lift the seeder slightly to prevent seed spillage, turn around, and start the next row adjacent to the previous one. Overlap the rows slightly to ensure complete coverage.
- 7. Monitor Seed Levels: Periodically check the seed hopper to ensure it remains adequately filled. Refill it as needed to prevent interruptions in planting.
- 8. Clean the Seeder: After use, clean the seeder thoroughly to remove any remaining seeds and debris. This helps maintain the seeder's performance and prevents clogs.
- 9. Store Properly: Store the rice drum seeder in a dry, covered area to protect it from the elements and prevent rust.

2. Benefit & Challenge of rice direct seeding

2.1.Benefit

1) Water Conservation

One of the most significant advantages of direct seeding is its ability to conserve water. Unlike transplanted rice cultivation, which requires a substantial amount of water at early stage after transplanting, direct seeding can be done in fields with reduced or no standing water. This helps address water scarcity issues in many regions and reduces the environmental impact of rice cultivation.

2) Labor and Cost Savings

Direct seeding eliminates the labor-intensive process of transplanting rice seedlings, which can be both time-consuming and costly. Farmers can save on labor costs and reduce the need for nursery preparation. Usually farmer can cover 1ha by one or two day by himself alone.

- Increased Crop Yield: ** When managed properly, direct seeding can result in higher crop yields compared to traditional broadcasting methods. It allows for more uniform plant spacing and better root development, leading to improved rice productivity.
- 4) Faster Crop Establishment: ** Direct seeding can lead to faster crop establishment and early matured since there is no transplanting shock, and the rice plants can begin growing immediately after germination.

2.2.Challenge

1) Weed Management:

Direct seeding can lead to increased weed pressure, as the absence of standing water may allow weeds to thrive. Effective weed management strategies, such as the use of herbicides or integrated weed management practices, are essential.

2) Disease and Pest Control:

Direct-seeded rice may be more susceptible to certain diseases and pests, as compared to transplanted rice. Farmers need to implement proper pest and disease management strategies to protect the crop.

3) Soil Preparation:

Proper soil preparation is crucial for direct seeding to ensure good seed-to-soil contact, germination and most important leveling well. In some cases, specialized equipment may be needed.

- 3. Results of Rice direct seeding
 - 3.1.Yield between Broadcasting, Line Direct seeding and Line transplanting Line Direct seeding show the result of 2ton/ha higher yield compared to traditional broadcasting. Compare to Line transplanting Line direct seeding slightly lower yield but no significant difference between two. This is the result of research activity by the University of Tokyo.



Table made by Prof . Kato, The University of Tokyo



3.2.Photo of activities