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Direct Seeded Rice (*Oryza sativa* L.)

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Introduction

Rice (*Oryza sativa* L.) is the first most important cereal crop of India and plays an important role in our daily dietary. Rice is being grown in many regions of the world. Rice contributes nutritionally significantly amount of the Thiamine, Riboflavin, Niacin and Zinc to the diet. Production of Rice in India is an important part of the National economy. India is the second largest producer of rice and the largest exporter of rice in the world. Year after year India has to increase its rice productivity but the possibility of expanding the area under rice is near future is limited. Generally, there are two basic methods of rice cultivation namely, transplanting and direct seeded rice. Transplanting is the system of raising seedlings first in nursery bed and then planted to direct field. Whereas Direct seeded rice refers to the process of establishing a rice crop from the seeds sown in the field. Recently, in response to rising labor cost, competitive demand for water the need to intensify crop production. Transplanting rice is labor intensive (30person/ha/day) and also cost of labor is rising for transplanting of paddy. There is a need for change in rice establishment method to improve productivity, economics and long-term sustainability. Depending upon water and labor scarcity, farmers are changing both tillage and rice establishment method (puddled transplanting to DSR in non-puddled soil).

How it is better than transplanting rice?

DSR is better than transplanting rice due to potential to save water and labor production of DSR is 5-10% more than the yield of transplanting rice. DSR technique is becoming popular nowadays because of its low popular demanding nature. The development of short duration early maturity cultivars and efficient nutrient management techniques along with increase adoption of integrated weed management methods have encouraged many farmers to switch from transplanting to DSR culture. It will reduce burning of rice straw that is environmentally unacceptable as its leads to the release of soot particles and smoke causing

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human health problems, such as asthma or other respiratory problems, emission of greenhouse gases such as carbon di oxide, methane and nitrous oxide causing global warming. In addition, the entire amount of carbon and Nitrogen, 25% Phosphorus and 20% of Potassium present in the straw are lost due to burning. This highlights the need for a comprehensive and scientific strategy to make direct seeded rice environmentally and Socio economically sustainable.

Advantages of Direct Seeded Rice

- No significant reduction of yield under ideal circumstances.
- 12-15% of irrigation water could be save using effective water management techniques.
- Reduces the cost, time and energy of growing.
- Decreased emissions of greenhouse gases.
- Reduces the cost of Agriculture, which raises overall profitability.
- Earlier establishment and crop maturity by 7-10days sooner.
- Avoids the needs for Nursery preparation, uprooting of seedlings and transplanting.
- Improve physical condition of soil.

Disadvantages of Direct Seeded Rice

- Increased seed rates.
- Birds and pests can access the seeds.
- Risks of inadequate or uneven crop establishment.
- Crop weed competition is high for nutrients, light, moisture and space.
- Sudden rain immediately after seeding may hurt crop establishment.
- The sowing needs to be done timely.
- Weeds are more likely to be problem in DSR than in puddled transplanting.

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- Increase in soil borne pathogens(nematodes), incidence of blast and brown leaf spot etc.

Conclusion

About 40% of the irrigation water used in the world goes towards growing rice using, traditional methods. This conventional method of rice farming is no longer viable over the long term due to increasing water scarcity brought on by climate change and competition from Urbanization. In order to fulfil growing demand and maintain food security, new strategies and innovations in rice farming are needed especially when combined with other concerns like a labor shortage and shrinking arable land. Direct seeded rice (DSR) is one potential answer to these problems instead of the conventional way of raising seedlings in a nursery before transplanting them into flooded fields, direct seedling is a crop establishment system in which rice seeds are placed straight into the field. Therefore, DSR one of the most efficient, sustainable and economically viable rice production system used today. Compared to the transplanted rice.

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