Direct Seeding of Rice

Why in news?

Recently, the Punjab government has been actively promoting the direct seeding of rice (DSR).

What is direct seeding of rice (DSR)?

- **Definition** – It is a planting method that involves *directly sowing of seeds* in the field.
- It requires *no nursery preparation or transplantation*.
- **Need of DSR** – The conventional transplanting method require intense labour, continuous flooding of water and takes higher time and labour resources.

Transplanting Method of Rice
• It is a planting method that involves the *planting of seedlings or whole plants in the field or garden*. • **Requirement** – seed germination may occur inside the greenhouse. • **Advantages** – Weed management is easier and it requires less amount of seeds. • **Disadvantages** – *Slower maturation* of crops. • It is *expensive* in comparing to DSR. • It require *more usage of water* and thereby affecting the ground water table.

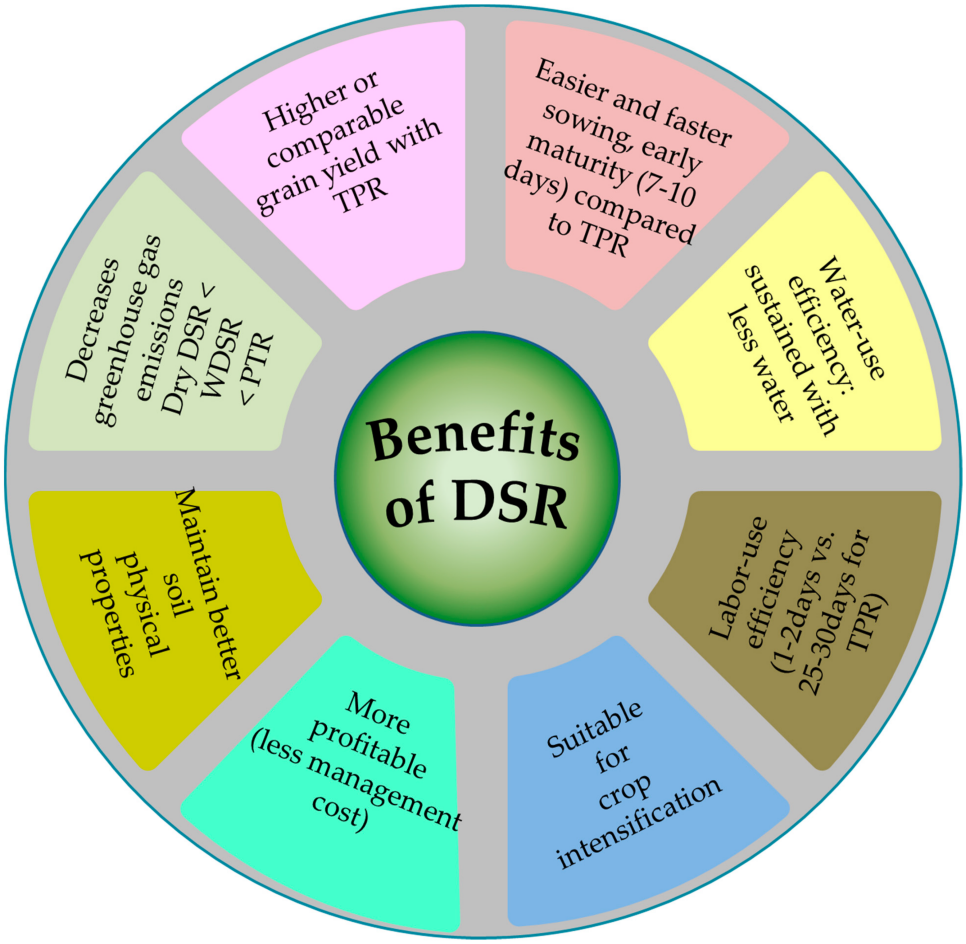
- **Requirements** – Soil suitability is crucial for the successful implementation of DSR.
- **Soil texture** – DSR should be *avoided in light-textured soils* as they do not retain water well.
- It is more *suitable for heavy or medium-to-heavy-textured* soils which contains more clay and less sand, whereas light-textured soils have less clay and more sand.
- **Iron content** – Soil with severe iron deficiency, and weed problems must not be cultivated using this technique.
- Even medium-textured soils are unsuitable simply due to their lack of iron.
- In case iron supplements are being used, farmers should *apply ferrace iron*, which is green-coloured and not oxidised, rather than oxidised iron, which is brown in colour.
- Lack of iron content can severely impact yields and lead to major financial losses for farmers.

What is tar-wattar technique?

- **Sowing of seeds** – The paddy seeds are directly sown, roughly 20-30 days prior to when they would have been transplanted.
- **Soil levelling** – The field is irrigated and laser leveled prior to the seeding process which is carried out using a seed drill or lucky seeder.
- **Seed treatment** – The seeds soaked in a fungicide solution for eight hours, then dried for half a day before sowing.

- **Irrigation** – The first round of irrigation is carried out *21 days after sowing*, followed by 14-17 more rounds at 7-10 day intervals, depending on soil type and the quality of the monsoon.
- The final irrigation takes place 10 days before harvest.
- The *traditional method requires 25-27 irrigations* in total.

What are benefits of DSR?



- **Saves water** - This can *reduce water use by 15% to 20%* (the traditional puddling method requires 3,600 to 4,125 litres of water to grow a single kilo of rice).
- **Saves labour** – DSR requires *less labour and matures 7 to 10 days faster*.
- **Ground water recharge** – DSR offers avenues for ground water recharge as it *prevent the development of hard crust* just beneath the plough layer due to puddled transplanting.
- Straw management – It *matures 7-10 days earlier* than puddle transplanted crop, therefore giving *more time for management of paddy straw*.
- **Higher yield** – Research results have also indicated that yield, after DSR, are *one to two quintals per acre higher* than puddled transplanted rice.
- **Environment benefits** – It leads to *lower GHG emissions.*
- **Labour welfare** – Mechanized DSR provides *employment opportunities* for youth through service provision business model
- *It increases total income* by reducing cost of cultivation.

What are the major challenges associated with DSR?

- **Irrational use** – In the race to avail the government incentives, some farmers *use DSR in unsuitable soils*, leading to the need for irrigation every second or third day.
- This completely *counteracts the water-saving benefits* of DSR, and in fact, ends up guzzling down more water.
- **Less soil availability** – Only *20% of Punjab's soil is light-textured.*
- **Lack of iron content** – It should not be cultivated in sandy and loamy sand as these soils suffer from severe iron deficiency, and there is higher weed problem in it.
- **Higher seed rates** – *Seed monopoly* automatically the price of seeds thereby reducing the income prospects for farmers.
- **Seeds exposed to birds and pests** – Direct seeding *increases the vulnerability of seed* to get targeted by the pests and birds.
- **Weed management** – There is higher growth of unsuitable plants in the DSR fields which compete the paddy crops and thereby reduce the yield.
- **Herbicide intolerance** – While herbicide needs to be sprayed to control the weeds, irrational use make the crops intolerant to herbicide.

What lies ahead?

- **Awareness drive** – A basic lack of awareness and understanding is holding DSR back.
- Thus, awareness should be created for rational use of DSR.
- **Educating farmers** – Extensive training and a ready helpline be provided, to handhold the farmers through the whole process, from pre-sowing to harvesting.
- This can instill confidence among farmers regarding DSR's efficacy.

References

1. The Indian Express| Slower Adoption of DSR in Punjab
2. IRRI| Direct Seeded Rice

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