



DIRECT SEEDING OF RICE - GS III MAINS

Q. Discuss the concept of direct seeding of rice (DSR) and its possible benefits and drawbacks. (10 marks, 150 words)

News: *Why direct seeding of rice (DSR) is yet to pick up in Punjab*

What's in the news?

- The Punjab government has been actively promoting the direct seeding of rice (DSR), or 'tar-wattar' technique,
- 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).
- Moreover, DSR requires less labour and matures 7 to 10 days faster, giving farmers more time to manage paddy straw.

Key takeaways:

- Despite these benefits, and government incentives (Rs 1,500 per acre, this year), this technique is yet to see widespread adoption in Punjab.
- Last year, only 1.73 lakh acres of the 79 lakh acres under paddy cultivation in Punjab saw the use of this technique.
- Even the government's target of bringing 7 lakh acres under DSR this year represents less than 10% of Punjab's total rice acreage.

Direct Seeding of Rice (DSR):

- In transplanting, farmers prepare nurseries where the paddy seeds are first sown and raised into young plants.
- These seedlings are then uprooted and replanted 25-35 days later in the main field.
- Paddy seedlings are transplanted on fields that are "puddled" or tilled in standing water using tractor-drawn disc harrows.
- In DSR, there is no nursery preparation or transplantation. The seeds are instead directly drilled into the field by a tractor-powered machine.

Benefits of DSR:

1. Water Saving:

- DSR technique can help save 15% to 20% water.
- Since the area under rice in Punjab is almost stagnant, DSR can save 810 to 1,080 billion litres water every year if entire rice crop is brought under the technique.

2. Sort Labour Issues:

- DSR can solve labour shortage problem because as like the traditional method, it does not require a paddy nursery and transplantation of 30 days old paddy nursery into the main puddled field.



- With DSR, paddy seeds are sown directly with machine.

3. 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.

4. Early Maturation:

- It matures 7-10 days earlier than puddle transplanted crop, therefore giving more time for management of paddy straw.

5. High Yield:

- Research trials indicated that yield, after DSR, are one to two quintals per acre higher than puddled transplanted rice.
- It offers low production cost in comparison to the transplanted rice.

6. Environment Friendly:

- DSR provides better soil physical conditions for following crops and less methane emission, thereby reducing its global warming potential.
- It matures 7 to 10 days faster, giving farmers more time to manage paddy straw, thereby reducing the stubble burning incidents.

7. Optimum Use of Resources:

- Enhanced fertilizer use efficiency due to placement of fertilizer in the root zone also makes DSR as a ample choice for sustainable agriculture.

Limitations of DSR:

1. Suitability of Soil:

- It is the most important factor as farmers must not sow it in the light-textured soil.
- This technique is suitable for medium to heavy textured soils including sandy loam, loam, clay loam, and silt loam which accounts for around 80% area of the state.

2. Weed Growth:

- Weeds are the biggest significant impediment to the success of DSR.
- Weeds are more problematic in DSR than in puddled transplanting because sprouting weeds compete with simultaneously emerging DSR seedlings.
- 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.

3. Higher Seed Requirement:

- The **seed requirement for DSR is also quite higher**, at 8-10 kg/acre, compared to 4-5 kg in transplanting.



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4. Cultural Operations:

- The **land levelling** is compulsory in DSR. This is not so in transplanting, therefore increasing the preparation cost.

5. Nitrous Oxide Emissions:

- While direct planting can help to reduce CH₄ emissions, aerobic soil conditions can also increase N₂O emissions.
- Nitrous oxide generation increases with redox potential.

By using several cultural strategies, including choosing appropriate cultivars, timing the sowing process, using the right amount of seed, and managing weeds and water, it is possible to achieve comparable yields in DSR. Farmers must be encouraged to transition from conventional transplanting to DSR culture through better short-duration and high-yielding cultivars, nutrient management systems, and weed control strategies.

