Direct Seeding Of Rice (DSR)

Why in news?

Farmers could adopt ‘direct seeding of rice’ (DSR) in place of conventional transplanting.

Why is DSR encouraged now?

- Punjab and Haryana (granary states) could face a shortage of labourers to undertake transplantation of paddy in the upcoming kharif season.
- This is mainly because the seasonal migrants from Bihar and Uttar Pradesh who usually arrive by early June, may not come in time.

How is DSR different from normal transplanting of paddy?

- **Conventional transplantation** - Farmers prepare nursery seedbed in the 5-10% of the area to be transplanted.
- Here, the paddy seeds are sown and raised into young plants.
- These seedlings are then uprooted and transplanted 25-35 days later in the main field.
- **DSR** - There is no nursery preparation or transplantation. The seeds are directly drilled into the field by a tractor-powered machine.
- ‘Lucky Seed Drill’ developed by the Punjab Agricultural University (PAU) can both sow seeds and simultaneously spray herbicides.
- This machine is different from the ‘Happy Seeder’, which directly sow wheat on combine-harvested paddy fields.

Why spray herbicides along with sowing seeds?

- **Wateracts as a herbicide for paddy** - The threat from weeds recedes once tillering (stem development) stage is over.
- The need to flood the fields will also be over.
- For the first three weeks or so after transplanting, the seedlings have to be irrigated daily to maintain a water depth of 4-5 cm.
- Farmers continue irrigating every 2-3 days even for the next 4-5 weeks, when the crop is in the tillering stage.
- The underlying principle here is simple: Paddy growth is compromised by weeds that compete for nutrition, sunlight and water.
- Water prevents growth of weeds by denying them oxygen in the submerged

stage.
- Aerenchyma tissues in paddy allow air to penetrate through their roots.
- **In DSR, water is replaced by real chemical herbicides.**
- Farmers have to only level their land and give one pre-sowing irrigation.
- Once the field has good soil moisture, they need to do two rounds of ploughing and planking (smoothening of soil surface).
- This is followed by sowing of the seeds and spraying of herbicides.

What are these herbicides?

- There are two kinds, called pre-emergent (applied before germination) and post-emergent (sprayed 20-25 days after sowing).
- **Pre-emergent** -In this case, the herbicide used is Pendimethalin.
- The Lucky Seed Drill that sows paddy can also spray the chemical, which costs Rs 450-500 at one litre per acre.
- Alternatively, farmers can use an ordinary seed drill and apply the herbicide immediately after sowing.
- **Post-emergent** - They include Bispyribac-sodium (Rs 600-700 at 100 ml/acre) and Fenoxaprop-p-ethyl (Rs 700-800 at 400 ml/acre).

What is the main advantage with DSR?

- **Water savings** - The first irrigation (apart from the pre-sowing) under DSR is necessary only 21 days after sowing.
- This is unlike in transplanted paddy, where watering has to be done daily to ensure submerged/flooded conditions in the first three weeks.
- **Labour** - About three labourers are required to transplant one acre of paddy in a single day.
- In 2019, transplanting labour costs were around Rs 2,400 per acre, which may double this time.
- The cost of herbicides under DSR will not exceed Rs 2,000 per acre.

What are the drawbacks?

- As DSR demands more of herbicides, the **availability of herbicides** may become a problem.
- The **seed requirement** for DSR is also higher, at 8-10 kg/acre, compared to 4-5 kg in transplanting.
- **Laser land levelling**, which costs Rs 1,000/acre, is compulsory in DSR. This is not so in transplanting.

How much area is likely to come under direct seeding of rice?

- The adoption of any new technology, be it Happy Seeder or Lucky Seed Drill, is ultimately dependent upon farmers feeling the need.
- The maximum area covered by DSR in Punjab was roughly 1.60 lakh hectares (lh) in 2015, which dropped in the subsequent years.
- It is expected to rise to 2-2.5 lh this time on the back of labour shortages.
- Even that would be hardly a tenth of the state's total 29-30 lh paddy area.

Source: The Indian Express

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