



Dr. J. K. Ladha, Dr. R. K. Gupta, and Dr. S.G. Patil interacting with the farmers in the Direct Seeded Rice (drill-sown) fields in Belgaum district

A report on Direct Seeded Rice (DSR) farming practices in Western Ghats of Karnataka state of India and opportunities for improvement

Dr. R. K. Gupta, CIMMYT-RWC and Dr. J. K. Ladha, IRRI-India visited the DSR (drill-sown) areas of western Karnataka. Dr. S. G. Patil, Head, Environmental Science, University of Agricultural Sciences, Dharwad who carried out the study in collaboration with IRRI and RWC on “Drill Sown Rice practices in western ghats of Karnataka” accompanied the team and facilitated the interaction with direct seeded rice farmers. The study helped documenting the practices followed by farmers for cultivating drill-sown rice in this region. A brief note covering the observations made and the information gathered during the visit is presented below.

Direct seeded rice occupies about 50,000 ha in the state of Karnataka, India covering the districts of Uttara Kannada, Dharwad, Belgaum, Haveri, Chickmagalore, Kodagu, and Shimoga. The topography of the land is moderate to gentle slope, and the land is categorized into low-, mid-, and up-lands depending on the toposequence. This region receives an annual rainfall of 2170 mm, but 80% of this is usually received during the north-east monsoon during the period Jun-Dec. Soils are, in general, poor in fertility and water and nutrient holding capacity.

Farmers prepare the land for DSR starting in the month of December and continue upto May when they sow the seed. Tillage operations are done intensively, but mainly by bullock-drawn implements. Ploughing, clod breaking, and leveling operations totaling to about 8-9 times are taken up by farmers aiming at getting a fine soil tilth and controlling weeds. Sowing in low-land areas is done early i.e., in the first week of May, while it is later in May in mid- and up-land areas. Sowing is usually carried out by bullock-drawn seed drill having 6-coulters with a spacing of 5-6 inches. Seeds are invariably mixed with fertilizer and sown. Seed rate adopted by the farmers is very high (100-120 kg per ha). Thinning and gap filling is done 20-30 days after sowing. Interculture for 2-3 times, again by bullock drawn implements, is practiced aimed at weed control, improved tillering, and moisture conservation.

There are more than 20 varieties cultivated by DSR farmers, and popular among them are Dodaga, Hakkalsali, Jaya, IR 64, Intan, Mattalaga, Poonam, etc.,

Farmers use both FYM and fertilizer nutrients. However, the application of N, P, and K is well below the required levels. FYM is applied @ 2-3 t per ha 10-15 days before sowing and is mixed into the soil. As a basal dose, N and P are applied in the form of DAP or a complex fertilizer at the time of sowing itself @ 5-10 and 10-12 kg per ha, respectively. A top dressing of 10 kg N and 9 kg K per ha is done at 30 days after sowing.

Weeds appear to be a very critical constraint impacting yields of DSR in this region. Weed management is practiced mainly by 2-3 interculture operations followed by a hand weeding. Chemical weed control by applying butachlor @ 2.5 l per ha is also practiced but to a lesser extent. Incidence of pests and diseases is reported to be significantly less than that experienced in transplanted rice.

There are considerable variations in the rice yields obtained by the farmers in the region. Some farmers harvest yields as high as 8 t per ha, and some as low as 1.2 t per ha. In general, farmers are harvesting rice yields of 4.5 t per ha which gives them a net income of Rs 8000 per ha. As most farmers have smaller holding and they take up land preparation and interculture operations by themselves without incurring expenses for the same, the net returns could be as high as Rs 15000 per ha.

Discussions during the visit with the farmers and the University researchers helped identify some modifications in the farming practices that could reduce the costs of cultivation and increase the yields and net incomes. The modifications suggested are listed below:

1. Retention of residues from the previous crop
2. Reducing the number of tillage operations
3. Direct seeding with improved seed drill
4. Reducing the seed rate from 100-120 kg per ha to 60-80 kg per ha
5. Instead of applying the fertilizer mixed with the seed, placing it separately
6. Broadcasting sesbania/sunhemp during the season and converting it into a mulch using 2, 4-D.
7. Increasing the fertilizer dosage to 50 N, 20 P, and 30 K kg per ha, and any additional applications based on Leaf Colour Charts (LCC).
8. Weed management by a post emergent herbicide (glyphosate) before sowing or and by a pre-emergent herbicide (butachlor or pretilachlor) just before sowing. Also, application of 2, 4-D or Almix as post emergent herbicides during the crop season on need basis.
9. In place of local varieties, going for improved high yielding short-medium duration (120-130 d) in lowland areas, mid-late maturity varieties in mid-lands, and short duration (120 d) varieties in uplands.
10. Exploring opportunities for growing crops that leave residues on land, and also increasing the cropping intensity.