

Success story under RKVY Project Implemented at UAS, Raichur

SUCCESS STORY- III

Dry direct seeded rice-a success story of conservation agriculture in Hyderabad-Karnataka region

**1. Title : Dry direct seeded rice-a success story of conservation agriculture in
Hyderabad-Karnataka region**

2. Category: Agriculture

3. Challenge :

Realizing the potential of the conservation agriculture based management systems in water scarce rice ecologies such as major command areas of the region, systematic work on dry direct seeded rice (DSR) was initiated by the University of Agricultural Sciences (UAS), Raichur. DSR technology has shown a new light to address the challenges of water and labour shortages, volatile energy, fuel and input costs, soil degradation and emerging climate variability and uncertainty.

4. Background:

DSR though not new to Karnataka farmers residing near Western Ghats (Belgaum, Dharwad and Karwar districts) but this technology is becoming a boon to the farmers of command areas of Tungabhadra (TBP) and Upper Krishna Project (UKP) where water supplies are limited. The tail end farmers do not get sufficient water at right time and faced with ON-OFF canal water supply. Due to declining resources, farmers of tail end get water once in 10 days in Upper Krishna (UKP) and 20 days in Tungabhadra Project (TBP) forcing farmers to complete transplanting within this period which is not possible with limited labours, machinery etc.

Under late onset of monsoon conditions and insufficient water in barrages, canal water may become erratic and untimely leading to delayed transplanting (beyond August). This entails intensive management for optimum yields. To tide over such predicaments, UAS Raichur with KVKs and research stations conducted series of demonstrations both in UKP and TBP. A year wise spread of DSR area in the TBP due to the sustained efforts of scientists, many extension personnel from Department of Agriculture and many innovative and risk bearing farmers is indicated in the table.

| Area | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| (Acres) | 50 | 200 | 1500 | 25000 | 50000 | 60000 | 65000 | 75000 |

5. Programme activities:

In recent years, due to both natural and anthropogenic manipulations, farmers in the tail end are left at the vagaries of erratic monsoonal climates though in commands. The farmers are thus facing severe water scarcity and in spite of shortage of water in *kharif*, many farmers in tail-end still willing to take risk to grow at any cost as many of these are from east coast of Andhra Pradesh attuned to rice cultivation. Response to our advice to go either for early dry seeding or take advantage of early rains received just one month before canal supplies was imminent success with farmers. This was suggested keeping in mind with establishment /germination of rice could very well survive drought for one month before switching over to canal water as and when available. However, exposing seedlings for more than a month to dry conditions is undesirable. Thus, taking advantage of early showers and direct dry seeding over transplanting caught the attention of farmers and introduced the DSR through demonstration in two or three villages in each of Koppal, Raichur and Yadagir districts.

DSR has become boon for such farmers in the tail-end command near Raichur. Kasabe camp, a small village near Raichur city. It can be called as a DSR village as well over 90 per cent the rice area in that village is under DSR. Farmers of these villages are getting more rice yields with less water, energy, labour, fertilizer and ultimately high net profit per unit area as compared to transplanted rice.

6. Results :

Success of DSR is mainly attributed to:

- Timely sowing
- Reduced cost of cultivation as compared to transplanting (labour, puddling costs, water for puddling-12-15% ; diesel 15-16 litres, etc)
- Reduced seed rate (8-12 kg per acre as against 25-30 kg per acre required for transplanting)
- Saves 35-40 per cent water and thereby helps to increase more area under irrigation, additional production , profit, reduced water logging/ salinity, increased environmental benefits etc.



Fig.1. Direct seeding vs Transplanting



Fig. 2. Dry direct seeded rice crop at various stages

- ✓ Reduced fertilizer (25-30%) and pesticide use etc
- ✓ Equal or higher yields (**see figure below**) with reduced production costs and higher net income
- ✓ Overall risk bearing innovative farmers participation

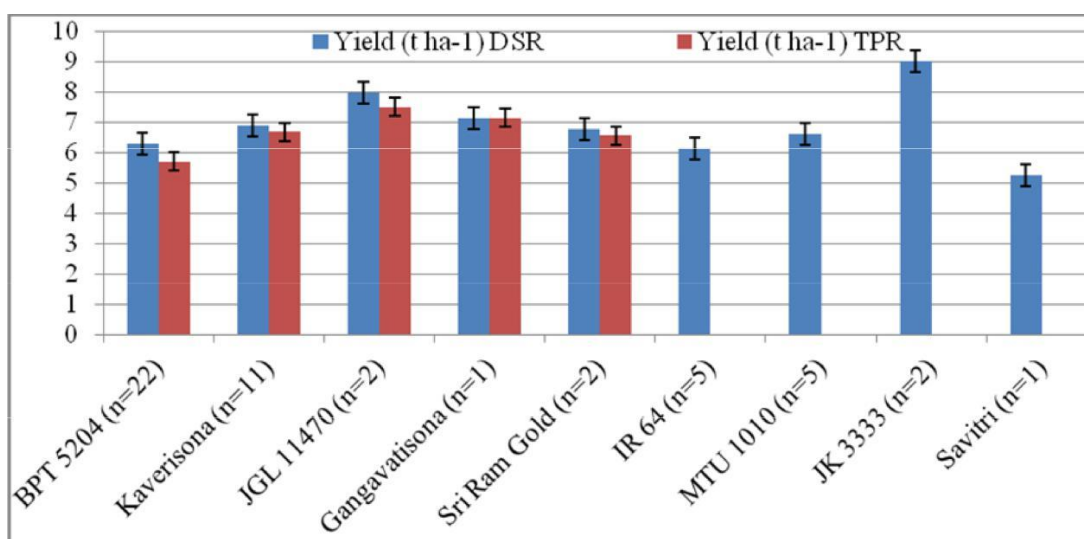


Fig.3. Grain yield (t ha⁻¹) of different rice cultivars under direct seeding and puddle transplanting

This was possible due to the sustained efforts initiated during 2004 in Khanapur, Mundagod of Western Ghats and UKP and follow up in TBP during 2008-09 in collaboration with CIMMYT and other public and private sector partners, which are promoting DSR and other CA based management practices helped.

7. Impact:

With lower seeds, water, energy, labours and lower fertilizers/ chemicals and assured yields without additional investment caught the imagination of some hard core scientists, administrators and policy makers alike in the state. Enthused by the turn of events, farmers are taking this revolutionary technology in to the length and breadth and also across inter and intra commands of the state. Efforts of mass media (daily news, DD, field days etc) accelerated spread and days are not far off to see DSR in every command due to falling resource bases.

8. Lessons Learned:

Initially, the adaptive research trials and participatory trials in farmers field were conducted by planters / machines introduced from various companies located in north India (Ludhiana, Punjab) and supply of new and maintenance machines/spares as and when required by farmers or end users was a major constraint. To create local expertise and save transport cost and time, efforts were made to link potential local manufactures with those available elsewhere in India especially, Ludhiana through CIMMYT linkage. Some local potential fabricators and designers were identified and sent to understand workout modalities of collaborative designs and fabricate them locally.

However, further efforts resulted in not only listing in CA based zero till multi crop planters and laser levelers in subsidy scheme and also have been part of the proposed service centers planned in the state financed by Govt. With the inclusion of zero till multi crop planter in the government subsidy and success of our DSR demos in farmers' field created demand for the zero till multi crop planters among the farmers of Karnataka. As a result, local farmers were again forced to purchase machines from Ludhiana with high transportation cost and necessary spares from outside manufacturers than local. The driving force for further success is largely by the availability of local manufacturers and service providers.

One of the alumni of the university involved in local manufacture/assembly of various machines (M/s Varsha Associates, Chitradurga) who fabricates machineries was approached to be a part to promote CA machines and their future in the state is immense. He readily agreed to produce a prototype based on the technical guidance from scientists of UAS, Raichur and CIMMYT a new state of the art zero till multi crop planter was assembled and was ready for use by the farmers. Some of the seed cum fertilizer zero till multi-crop planters with cup type seeding devices with depth control wheel fabricated by him were purchased and supplied to farmers. However, newer machines with seed covering device introduced in Punjab and Haryana are very essential when seeding is to be performed under inappropriate soil moisture conditions.



Zero till multi crop planter developed by M/s Varsha Associates

9. Additional information:

UAS, Raichur with the support from various national and International organizations such as CIMMYT, ILVRI, PAU etc efforts were made to train the scientists working in each and every stations of UAS, Raichur on CA practices, nutrient management for sustainable agriculture and machineries (zero till machines, bed planters, Turbo-Happy Seeder, Laser land leveler). The unique feature is that these machines are available to the local farmers on demand at reasonably low rent. Now, each research station is acting as a custom hiring centre for CA machinery. Besides this, new strategic research on different crops is also being conducted / demonstrated at various research stations of the University for the benefit of farming community. UAS, Raichur has perhaps largest area which is laser levelled in the state. CIMMYT, India has been supporting the state with a long term vision by providing advance training on CA to Programme coordinator, KVK, Gulbarga at Mexico and has agreed to provide placement for our two of our scientists for similar advance training on CA tools to combat climate change issues in future with the financial support from UAS, Raichur.

10. Evidence:

The success of DSR is very evident in the tail end region of TBP particularly at Kasbe and Vijayanagara Camp of Raichur district. The farmer's interaction clearly indicated the benefits of DSR especially during late release of canal water and higher benefits cost ratio obtained in DSR when compared to transplanted paddy.

| No. | Question to consider | Yes | No |
|-----|---|-----|----|
| 1 | Is the story interesting to the target audience of the project/activity report? | ✓ | - |
| 2 | Does the story explain what new insights the project brings? What is the main lesson learned from this story? Does the story describe a key insight on what works and what doesn't and something that future project could build on | ✓ | - |
| 3 | Does the story describe the outcomes the project produced and the people who are benefitting? What changes—in skills, knowledge, attitude, practice, or policy—has the project brought, and who is benefitting from these changes? | ✓ | - |
| 4 | Does the story make a compelling point that people will remember? Does the story show how the project makes a difference to improving livelihoods and lessening poverty? | ✓ | - |

| No. | Question to consider | Yes | No |
|-----|--|-----|----|
| 5 | Does the story provide an interesting fact that people will remember? For example, how much yields increased, how many hectares of land could become more productive from this innovation or technology? | ✓ | - |
| 6 | Does the story explain what kind of impact this innovation or technology could have if scaled up? | ✓ | - |
| 7 | Does the story show which partners contributed and how? | ✓ | - |
| 8 | Does the story include quotes from Stakeholders or beneficiaries? | ✓ | - |
| 9 | Have I provided links to other media (journal articles, website news, newsletter, blogs, annual reports of other Programme/ project) that also feature this story? | ✓ | - |
| 10 | Have I provided the contact details of people who can provide more information? | ✓ | - |

11. Contact person for this story (name, position, email address)

Dr. A.S. Halepyati

Dean (Agri.)

College of Agriculture, University of Agricultural Sciences

Raichur – 584104, Karnataka (India)

Phone (O): 08532-220041

Mobile (India): 9448183342

E-mail: halepyati49@rediffmail.com, deanacr09@rediffmail.com