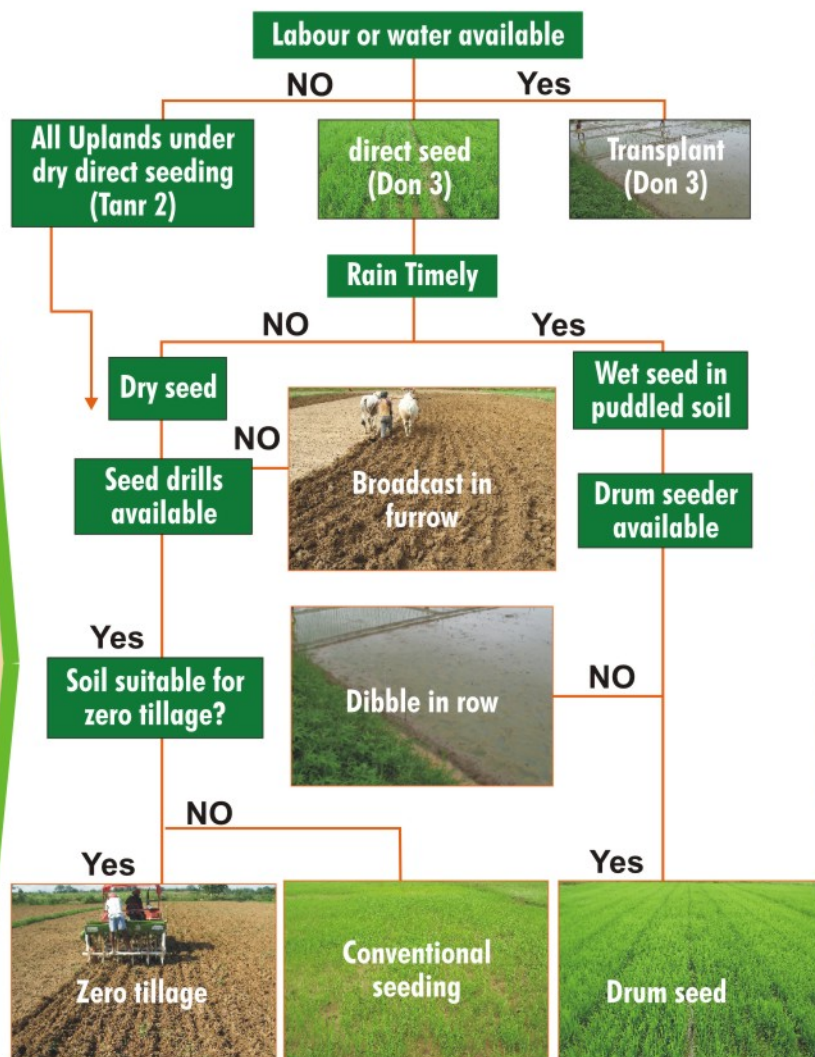


## Rainfed rice crop establishment in drought prone upper toposequences: decision tree



## Resilient Production System for drought tolerant Sahabhagi dhan

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Editing and layout : B. N. Sarangi, G.A.K. Kumar, S.K. Sinha & Sandhyarani Dalal

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## Resilient Production System for drought tolerant



# Sahbhagi dhan

Mukund Variar, Nimai Prasad Mandal  
and Vidyadhar Shukla



Release of early, drought tolerant rice variety Sahbhagi dhan for bunded uplands and rainfed drought prone shallow lowlands of Jharkhand and Orissa has made it possible to reduce losses from intermittent drought while ensuring stable rice yields in a drought year. Sahbhagi dhan matures in 105-110 days in the plains of Orissa and 110-115 days in the plateaus. Depending on moisture availability and soil type, it can be direct sown or transplanted. Direct seeding in dry soil saves about 30% of water. It can be done with a zero till machine or a seed drill if they are available, or seeds can be sown behind the plough or broadcast after furrows are opened. Direct seeding can also be done in wet soil with pre-germinated seeds using a drum seeder or broadcast. Seed cum fertilizer drills or zero till machines allow placement of fertilizers near the root zone giving a head start to the rice seedlings compared to weeds in terms of access to nutrients. It is a good practice to use a worn out plough to make shallow furrows to adjust seeding depth when seed drills are not available.





Efforts have been made at the CRURRS, Hazaribagh to develop a package of practices for successful cultivation of Sahbhagi dhan. The details are listed below:

#### **Off-season ploughing :**

One deep ploughing at the beginning of summer months helps to bury weed seeds at a depth that prevents their germination. It also helps to kill insects or pathogens in the soil.

#### **Land preparation :**

For dry seeding, plough the field after receipt of monsoon rain 2-3 times to get a fine tilth as the land should be properly levelled for uniform germination and crop stand.

In case of transplanting, prepare seedbed during middle of June to early July.

#### **Seed priming :**

Seed priming can also be done by soaking seeds in water or a solution containing seed invigorators or fungicides. Please see the decision tree to select suitable crop establishment method.

#### **Crop establishment :**

In case of dry seeding, sow the seeds in 20 cm apart in rows either by seed drill or behind the plough with a seed rate of 80 kg/ha. In transplanted crop, plant twenty-five day-old seedlings in 20 cm x 15 cm spacing with 2-3 seedlings/hill. In wet seeding, dibble sprouted seeds (soaked in water for 24 hours and incubated for 48 hours) using drum seeder or manually by July 15 with a seed rate of 60 kg/ha.

#### **Fertilizer management :**

Follow soil test-based fertilizer recommendation for best results. In its absence, apply 30 kg  $P_2O_5$  and 20 kg  $K_2O$  at final land preparation. Compact the soil by laddering or wooden planks to conserve moisture before sowing. Apply 60 kg N in 3 splits at basal, 3 and 7 weeks after sowing.

In case of transplanted crop, apply nitrogen at 60 kg/ha in 3 splits;  $\frac{1}{2}$  as basal and the rest in two splits at 3 weeks and P.I. stage. If *Sesbania* green manuring is done, first dose of N could be reduced by 10 kg/ha.

#### **Weed management :**

Cultural methods to manage weeds can begin early if pre-monsoon showers allow 1-2 ploughings. Allow first flush of weeds to germinate which can be ploughed down at final land preparation. For herbicidal weed control, apply butachlor at 1.5 kg/ha or pretilachlor at 800-g/ha or pyrazosulfuron ethyl at 20 g/ha in a thin film of water in transplanted rice field at 3-6 days after transplanting (DAT). It can be done either by spraying or broadcasting granules or even by mixing EC formulations with sand 50 kg/ha and then broadcasting the same. Pre-emergence application of butachlor (3-5 days after sowing) at 1.25 kg/ha or pretilachlor at 800 g/ha in moist surface soil effectively controls the first thrust of grassy weeds and sedges in direct seeded rice. Chemical weed control should be followed by mechanical weeding or light manual weeding before topdressing nitrogen.

#### **Plant protection:**

Need-based application of insecticides/fungicides may be taken up under epiphytotic conditions.

#### **Harvesting :**

Harvest the crop when 75-80% of the grains are mature.

Grain yield of Sahbhagi dhan range from 4-5 tons/ha in direct seeded/transplanted conditions when the crop establishment is timely and the crop is moderately fertilized. Nitrogen may be top dressed when soil moisture is adequate and weeding is done. Sahbhagi dhan tolerates intermittent dry spells better but it may not tolerate cold as well as others, hence very late transplanting is not advised. It is also not suitable for boro cultivation.

