



Promotion of Improved Chickpea Varieties in Rice-Based Cropping Systems of Smallholder Farmers of Odisha

Chickpea in the Rice-Fallow Cropping System MG Mula, S Samineni and PM Gaur

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International Crops Research Institute for the Semi-Arid Tropics



Government of Odisha

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Chickpea in the Rice-Fallow Cropping System

The Semi-arid and Arid tropics ecology and weather have undergone a noticeable change due to climate change which has reduced pulse production by more than 56%. Considering this adverse effect of climate change, farming systems need to be established that are appropriate for, and tolerant towards, a specific area and its environment. Given these conditions, there is a need to increase production of pulses and improving livelihood by utilizing the ricefallow cropping system of smallholder farmers. However, the focus should be on deep black soil where moisture retention is high that will last to 2-3 months as compared to red soils.

Rice-Fallow Cropping System – A new cropping system helps farmers grow two crops a year where before they could only grow one crop. The new system combines early ripening varieties of rice with chickpeas. Because the rice can be harvested early, there's time to sow a chickpea crop to take advantage of the moisture still left in the soil. Previously the rice ripened too late and the land was left fallow. Now, farmers can grow an extra crop, a big advantage where there is no irrigation.

Why Chickpea in the Rice-Fallow Cropping System?

- Cultivar: Desi and Kabuli
- Drought resistant crop
- Utilizes available residual moisture for 2-3 months
- Provides protein (23%), rich in fiber, minerals and ß-carotene
- Enhanced soil by providing nutrient to the succeeding crop (fix nitrogen up to 140kg/ha)
- Adds organic matter to the soil
- Additional income to farmers (raw and seeds)
- Provides farmer feed/fodder to livestock
- Minimal tillage
- Dibbling method
- No basal fertilizer required but 2-3 times foliar (Urea) spray is required
- No weeding required
- Sowing (November/December)
- Harvesting (February/March)

Minimal Tillage

- Select rice fields with deep black soil or light soil having sufficient moisture just after harvesting rice.
- One Harrowing and levelling







• Hydropriming: 3-4 hours before sowing



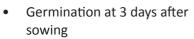
• Dibble Method, Straight Line Sowing, and Spacing: 30cm x 20cm





- Seed Rate: 75 kg/ha (Desi) and 100 kg/ha (Kabuli)
- Plant Density: 166,000 plants @ one seed/hill







• Germination at 5 days after sowing



• Plant growth at 8 days after sowing





• Vegetative growth at 12 days after sowing



 Spray as foliar Urea base (2-3x) at increasing rate of 2% (20-30 days after sowing – depending upon crop stand) to 6%/ha (every 15 or 20 days after) during vegetative stages.

First foliar spray at 20 days and 40 days after sowing



3rd foliar spray at 60 days after sowing or at flowering stage





Final Vegetative Stage

• Flowering Stage



Pod Development Stage





• Maturity Stage; Productivity - 1,500 kg/ha







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