



ग्रामीण विकास ट्रस्ट
GRAMIN VIKAS TRUST



CATC|Canolfan Astudiaethau Tir Cras
CAZS|Centre for Arid Zone Studies



Birsa Agricultural University

Farmers and Plant Breeders in Partnership



High
quality
rice varieties
for the rainfed
uplands of
Eastern India

Poor farmers in marginal areas have benefited little from the high yielding, 'green revolution' varieties that have transformed the productivity of more favourable areas. As a result, poor farmers, such as those who cultivate upland rice in the north eastern states of India, continue to grow old landraces that are low-yielding and susceptible to pests and diseases.

Two outstanding rice varieties

Ashoka 200F

The importance of early-maturing, drought-resistant rice varieties for the rainfed uplands.

Farmers of rainfed uplands require varieties that mature in less than 100 days, but still produce a reasonably good yield of grain and fodder. Farmers greatly appreciate early maturity because it shortens the hunger gap and reduces the risks from drought when the rain stops too soon. An early harvest also fetches a higher market price.

Participatory varietal selection was used to identify suitable parents.

Using participatory varietal selection (PVS), we gave farmers a choice of recommended and non-recommended rice varieties from which they chose Kalinga III. Farmers liked this variety because it is extra-early maturing, produces a high yield and has good grain quality. Despite these qualities, adoption of Kalinga III has been limited because of its poor inherent resistance to drought and susceptibility to lodging due to weak stems.



Kalinga III was chosen as one parent, but a complementary upland variety was hard to find. Instead, we crossed Kalinga III with an irrigated variety IR64; a variety that had been adopted in eastern India for medium lowland conditions. IR64 complemented Kalinga III with better lodging resistance, higher yield and multiple pest and disease resistance.

researchers on the research station. Local farmers visited the BAU-GVT (Birsa Agricultural University/Gramin Vikas Trust) research farm in 1998 and selected among F₄ families from a cross between Kalinga III and IR64. The most-preferred family, selected jointly by farmers and scientists, was released as Ashoka 228. It is taller than Ashoka 200F and matures slightly later (i.e. 95 days), but is still earlier than some local varieties. In research trials it yielded about

for the rainfed uplands: and Ashoka 228

Participatory plant breeding - a rapid, cost-effective method of developing new, improved rice varieties.

In a participatory plant breeding (PPB) programme, we crossed the variety Kalinga III with IR64 to produce two outstanding rice varieties: Ashoka 200F and Ashoka 228. Ashoka 200F is the first variety of rice to be developed through *collaborative* participation where a farmer grew the variable bulk in his field and selected within it. Ashoka 200F yields 20% more than Kalinga III, matures early (after about 86 days), grows about 95 cm tall and has superior cooking quality. It also performs well in drought-prone, weedy conditions.

Another variety, Ashoka 228 was developed through *consultative* participation - i.e. where farmers selected among entries grown by

20% more than Kalinga III and the cooking quality is even better than that of Ashoka 200F.

Ashoka 200F was the result of a single generation of selection by a farmer. However, farmers have selected for several generations in the same bulk to produce material that is highly uniform and well adapted to their fields (Fig. 1).

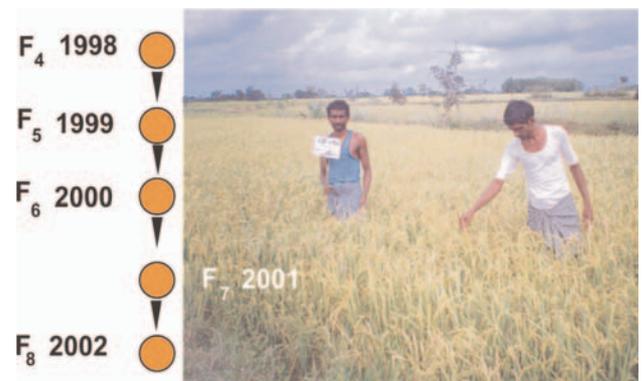


Figure 1: History of farmer's selection in a bulk from Kalinga III x IR64 cross. By 2002, the farmer from West Bengal had grown the bulk for 5 years.

The new Ashoka rice varieties are not just an excellent new technology but they are also in demand because they replace old landraces still grown in large area of uplands. Community-based organisations, small-scale seed entrepreneurs, the Gramin Vikas Trust (GVT), Birsa Agricultural University (BAU) and the state Departments of Agriculture are all involved in multiplication of seed.

Farmers perceptions of the new rice varieties.

The majority of farmers thought that, compared with local cultivars the new varieties were higher yielding and more resistant to lodging, and had many other favourable traits (Fig. 2). These long- and slender-grained varieties were easier to market and fetched a higher grain price than the local, coarse-grained varieties. A survey in 2004 gave a price advantage in Jharkhand and Orissa of 33%.

In recent years, adoption has spread beyond the project area. For example, the GVT Western Rainfed Farming Project, already has an active seed multiplication and distribution programme for these new varieties. This widespread adoption has been fuelled by their superior perform-

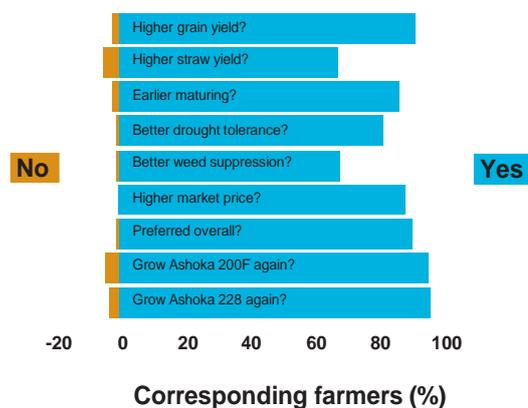


Figure 2: Farmers' perceptions (expressed as a % of farmers interviewed) of Ashoka 228 and Ashoka 200F rice varieties compared to the local cultivars.

ance under both favourable conditions and extremely droughted conditions.

In 2003, BAU released Ashoka 228 and Ashoka 200F as Birsa Vikas Dhan 109 and Birsa Vikas Dhan 110.

The new rice varieties are ideal for direct sowing in uplands and any organisation that wishes to promote them should contact us for further information.

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