Behaviour of ricebean landraces in post rainy season: Potential for crop intensification in dry areas

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Objective:

Explore the possibility of growing ricebean as a post rainy season crop in the areas where:
- Lands remain fallow after August-September or
- Other crops with limited returns grown
Scope of the work:

- Integrate ricebean into fragile ecosystem, e.g. Tars and sloping terraces, areas with shifting cultivation as it has good drought tolerance, soil binding & soil conservation properties

- After *Ghaiya* (upland rice) in the Tars (100,000 ha)

- After maize (<1000) with estimated areas of about 170,000 ha
- Ghaiya-based system mostly one crop of Ghaiya a year with limited areas planted to black gram or niger

- Maize-based systems: oilseed rape, wheat or barley planted after maize under residual moisture
## Variety by time of planting trial on ricebean

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Number</th>
<th>Details</th>
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<tbody>
<tr>
<td>Number of variety</td>
<td>4</td>
<td>LRGR 91, LRGR 111, NPGR05364, NPGR00008</td>
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<tr>
<td>Number of location</td>
<td>3</td>
<td>Chitwan: 220 m, Tanahun: 566 m, Dhikutpokhari: 1266 m</td>
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<tr>
<td>Time of planting</td>
<td>3</td>
<td>1 August, 15 August, 30 August</td>
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Demonstration conducted during autumn 2008

Appreciable vegetative growth, Indeterminate accessions changed to determinate bushy plants with clusters of flowers and pods.

Sowing date: 12 Aug 2008
Spacing: 75 cm x 50 cm
Plot size: 1.5 m x 2 m
Soil fertility does influence growth habit of ricebean.
Trial planted in Tar area on a farmers’ field
In Tanahun, autumn 2009
Close view of the trial at Tanahu with 1 August planting in the foreground & 30 August background.
Determinate accessions flower between 100-110 days in main season
Summary results

There was no effect of date of planting on any attributes of rice bean measured

Location effect was most pronounced

Although, there was no statistical difference for grain and biomass yield and most of the traits either between the varieties or the planting time, however the total grain harvested from Tanahun site (which is most fragile environment) even under wide spacing was very promising
A significant difference for interaction between location and time of planting could be found for a number of traits for indicating that different planting time would be appropriate at different locations.
Growth of indeterminate accessions was greatly reduced but they did show some tendency for trailing type behaviour but were largely bushy with cluster of flowers & pods.

By planting late in the season flowering time reduced nearly by half with a saving of 45 days saving in just in time to mature.
August 12 planted crop in 2008 gave reasonable yield (300-500 kg) at around 1200 m

- Plant height and growth habit seems to be influenced by soil fertility & also by soil moisture content.

- Rice bean lines even in autumn tend to be trailing type as long as soil is fertile with adequate moisture is available.
Plant stand, growth and development of ricebean is highly affected in late planted crop

Last year, due to drought black gram planted in the area was badly affected but rice bean still gave reasonable yield
Few considerations for future work

To have good canopy cover 50x20 spacing is too wide for Tar areas & mid hills. This needs to be reduced to 20x20 or 30x20

Use of seed priming with plain water or nutrient loading with micronutrients e.g. phosphorus, zinc and boron will significantly improve the plant stand, their growth and development

Ghiaya is not quite harvested in the first week of August hence planting ricebean in the second week of August will be more practicable
From the practical point of view:

Chitwan is not suitable for promoting ricebean in autumn considering the other more remunerative options.

Middle altitude areas may also be unsuitable as farmers tend to go for winter crops e.g. oilseed rape, wheat or barley under residual moisture and planting these crops after ricebean is not feasible.

This leaves Tar area where this crop has greatest comparative advantage during post rainy season.
Why promote ricebean in fragile ecosystem, e.g. Tars?

- It can be grown in low input condition
  - minimum tillage, residual moisture and residual fertility

- Becomes mostly determinate due to photosensitivity & probably thermo sensitivity-no staking required

- Breaking cereal-cereal rotation

- Soil conservation and soil fertility enhancement in fragile ecosystems

- Potential for enhancing family nutrition and income