

Extension Folder no. : 09/2013
Under Tribal Sub Plan (TSP)

PRODUCTION TECHNOLOGIES FOR COWPEA ("ALSANDO") IN GOA

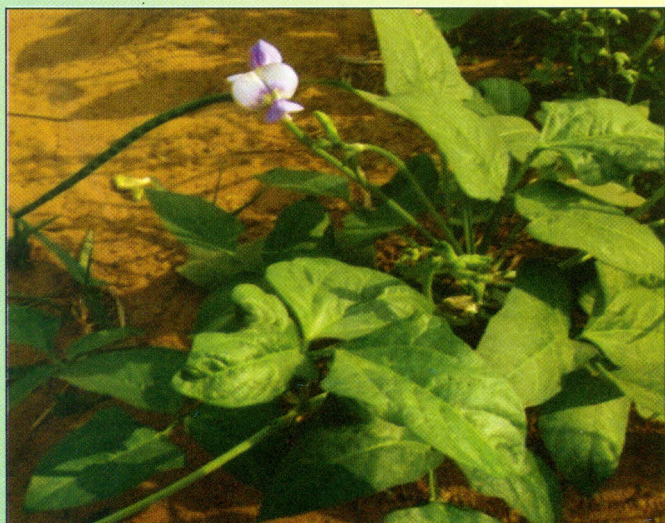


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ICAR Research Complex for Goa
(Indian Council for Agricultural Research)

INTRODUCTION:

Cowpea (Alsando) is an important pulse crop followed by other pulse like “chavli” (white cowpea), local black gram (urid), local green gram (moong), Kulith or horse gram though on a very minor scale. The local preference is due to high value realized from Alsando which is termed as a five star delicacy due to its bold grain and soft texture along with exquisite taste.



- ❑ Every 100 gm contains 28g vegetable protein, 50-60g carbohydrates and 4g minerals and other trace elements required for healthy diet.
- ❑ It is an energy rich crop often grown under energy starved conditions.
- ❑ It fixes 45-150kg/ha⁻¹ atmospheric nitrogen by virtue of biological nitrogen fixation.
- ❑ It help in smothering weed flora (20-45%) when grown as intercrop in wider spaced crops.
- ❑ It demands no irrigation and improves soil biotic life at the same time enriching the soil.

CLIMATE :

- ❑ The crop requires warm and humid climate. In Goa, “Alsando” serves as a dual purpose pulse being cultivated both in kharif (June-Sept) mostly for green leafy vegetable in lateritic uplands (morod) and also as an intercrop .
- ❑ It can be very well thrive in rice fallows during rabi season between late November to January, where the crop is solely grown under residual moisture conditions in rice fallows
- ❑ Delay in sowing beyond January, exposes the crop to moisture stress leading to delayed seedling emergence and seedling vigour.

SOIL:

Cowpea (Alsando) requires sandy, sandy loam or alluvial soils. However, it can also be grown in lateritic soil with good water holding capacity. Soils with satisfactory organic carbon >0.6 and pH between 5-6.5 give good response to it's cultivation.

SEED AND VARIETY:

It is advisable to use pure seed from a reliable source which is free from admixtures and variations. Alsando Selection-1;

- ❑ ICAR Research Complex for Goa has purified local genotypes and has recommended for cultivation in Goa.
- ❑ It has duration of about 105-115 days to mature. The pod length is 14-16cm with 9-11 seeds/pod. The average number of pods/plant is between 14-18.
- ❑ The variety has been tested under On Farm trials as well as Frontline demonstrations conducted for last 5 years and has resulted in yield levels up to 11 q/ha.

SEED RATE & SOWING METHOD:

Maintenance of optimum plant population in field is key to bumper harvest. In improved practice, the seed rate is enhanced to 25kg/ha. In order to achieve optimum plant population /unit area.25 kg quality and recommended variety from reliable source would be required/ha. The optimum sowing time should be decided based on the available soil moisture after planking (Gutto) mainly to conserve soil moisture



- ❑ Sowing is done by opening furrows with a cultivator or plough with 45cm spacing in straight lines. Treated seeds are then sown at 15-20cm distance in the furrows and immediately covered with soil and the field is planked to reduce moisture loss.
- ❑ The appropriate time of sowing is 2nd week of June for Kharif and 3rd to 4th week of November for rabi crops
- ❑ Early sowing coupled with enhanced seed rate and adequate seed treatment leads to uniform germination and optimum plant stand which is the key to higher productivity as seen in OFTs as well as FLDs conducted so far.
- ❑ Before sowing, the seed is to be incubated in water for 4-6 hrs followed by seed treatment with *Trichoderma viride* @10g/kg. After drying in shade, it should be treated with PSB culture @10-15g/kg seed before sowing. Phosphate solubilising bacteria (PSB) @ 1kg/ton of manure is recommended for soil application.

INTER CULTURE:

- ❑ The field is kept weed free by moving rotary weeder between the lines once at 20-25 days of sowing and again after 15-20 days so as to keep the field weed free.

WATER MANAGEMENT:

The requirement of water for cowpea is minimum. Normally the crop is taken purely on available soil residual moisture during rabi season. However, it is observed that one irrigation during flowering stage enhanced the pod yield by 20-30%.

NUTRIENT MANAGEMENT:

“Alsando” requires 10kg:N, 50-60kg:P₂O₅ and 30kg:K₂O per ha. The fertilizer requirement has to be worked out based on STR(Soil test report) after the harvest of paddy.

- ❑ Cowdung manure (5-10 cart loads/ha) is mixed with 500g/ha PSB culture and rhizobium (500g/ha). Slight water is to be sprinkled and the whole mixture is turned by mixing three to four days so that the bacteria proliferate in cow dung/farm yard manure.
- ❑ The mixture is covered with wet jute bags or coconut leaves to protect from moisture loss. On fifth day, the entire manure is to be broadcasted or placed in furrows made for sowing the seed.

- ❑ Use of phosphate solubilising bacteria (PSB @10kg/ha) either as seed treatment or soil application along with farm yard manure will facilitate phosphorous release and uptake by plants.



Foliar fertilization practiced with 2% DAP (200gm dissolved in 10 lit water) at flowering (40- 45 DAS and second spraying at pod initiation stage (70-75 DAS) drastically increased the final pod yield and the test weight of harvested produce due to enhancement in the accumulation of photosynthates in reproductive parts. yield increases ranging between 20-35%. In case of micronutrient differences reported and recommendations as per soil test report may be applied during land preparation.



INSECT MANAGEMENT:

The pulse crops in general are subject to infestation from mainly sap sucking pests in the initial period of crop growth, during flowering and pod formation.

The sucking pests like Leaf hoppers, Aphids, Jassids, Thrips and mites suck the plant sap from tender leaves, flowers and young pods by making extensive colonies and as a result of their feeding, they devitalise the plant, stunt the growth besides transmitting viral diseases like mosaic etc.

Besides, the crop is also attacked by leaf eating caterpillar which cuts holes on the leaf surface and in case of heavy infestation defoliates the plant. Pulses are also attacked by borers which bore into tender developing pods and feed on the developing grain.

Spray the crop with Bavistin 1g/ Hexaconazole 1 ml in 1 litre of water Any contact or systemic insecticide spray containing Monocrotophos or chlorpyrifos 2.5 ml / ltr is adequate.



DISEASE MANAGEMENT:

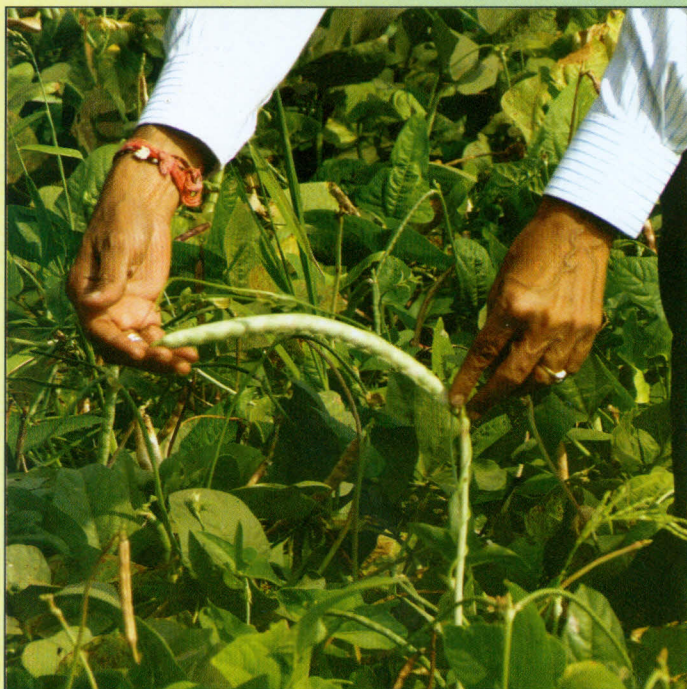
Among diseases, powdery mildew, leaf spots and mosaic are important.

- ❑ Use of disease free seeds.
- ❑ Field sanitation – removal of crop residues.
- ❑ Crop rotation
- ❑ Seed treatment with Thiram 2.5g or Bavistin 1g/kg or *Trichoderma viride* or *T. harzianum* @ 10 g/kg

HARVESTING AND THRESHING:

· The crop matures in 110 days from the date of sowing. The pods are picked up as they show signs of maturity giving brown discoloration and gradual drying.

· Normally, three to four pickings are made. The pods are then sun dried on mats for three to four days till they become brittle with moisture level below 10-12 %. The grain is separated by trampling the pods under feet or by use of wooden stick.



YIELD:

Well managed crop with proper / scientific package of practice can yield between 9-11 qtl / ha as per Frontline Demonstrations results.

STORAGE:

The seeds are dried to reduce the moisture level below 10-12%.

The harvested grain is stored in airtight plastic containers which are not opened till the next season to maintain the moisture level and to ward off incidence of insect pests which is a major stored grain problem.

Various methods of seed storage are used to protect the grain (pulse) from insect damage. Some of the common practices followed are use of neem leaves, use of castor/mustard oil, or finally crushed Triphal or even Boric acid powder @ 3-4g/kg.



ECONOMICS:

The Trial / Demonstration results for “Alsando selection-1” with management practices yielded (8.90q/ha) against traditional farmers practice (6.89q/ha) which was 29.17% increase bringing in additional income between eight to fourteen thousand rupees.

ECONOMIC ANALYSIS :

The results obtained from field level programmes like Front-line demonstrations on popularizing ago techniques in Alsando selection gave a Benefit cost ratio of 1: 2.69.

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