



## Seed Production of Kharif Pulse Crops

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Pulses occupy special place in agriculture as they are important part of vegetarian diet. They have nodules in their roots which fix the atmospheric nitrogen and thus help to sustain soil fertility. Pulses have ability to survive in adverse conditions particularly in low rainfall regions so are important for different crop rotations in the rain fed area. Moong, urd, pigeonpea and cowpea are the important *Kharif* pulse crops of North Western India. Important varieties of pigeonpea and moong; and their seed production are briefly described below.

### Pigeon pea

- 1) **UPAS 120:** It's a medium height variety which matures in 130-140 days. It has indeterminate growth habit with profuse branching. Average yield of the variety is 6q per acre.
- 2) **Pusa 992:** The variety was released for entire North West India. It takes 140-150 days to maturity. It is of medium height with bold grain. Average weight of 100 grains is 8.8-9.0g. Average yield is 7-8q per acre.
- 3) **Pusa 2001:** This variety was also developed by IARI, New Delhi. It matures in 140-150days and has good branching. The grain is quite bold with average weight of 8.2 g per 100 grains. Average yield is 7-8q per acre.

### Moong

- 1) **Pusa Vishal:** The variety was recommended for cultivation in the North Western India during summer season. It has bold grains and is a short duration variety. In the summer it matures in 60-65 days. Best sowing time for the variety is first fortnight of March. It gives an average yield of 4-5q per acre.
- 2) **Pusa 9531:** It is also a very good variety recommended for summer cultivation for North West India. It also takes 60-65 days to maturity. It has comparatively small but shining grain. Both Pusa Vishal and Pusa 9531 are suitable for one time harvesting and thus pod picking may be avoided.
- 3) **SML 668:** This variety was developed at PAU, Ludhiana for summer cultivation. It is a very bold seeded variety and also matures in 60-65 days. It can also be harvested at one time and gives an average yield of 4-5q per acre.
- 4) **Pusa Ratna:** The variety was developed at IARI New Delhi for cultivation in Delhi state. It is recommended for cultivation in Kharif season. It is tolerant to Yellow Vein Mosaic Virus disease. Grains are also bold.

For quality seed production of moong, pigeon pea and other pulse crops, the following points may be kept in mind.

## Field Selection

Pigeon pea and moong also have problem of hard seeds like other pulses. The shattered seeds remain in the soil and grow as volunteer plants in the coming seasons. The volunteer plants may cause admixture or genetic contamination by natural out crossing, if not removed timely. So the field selected for seed production should be free from volunteer plants. To achieve this, it should be ensured that there was no same crop in the field for the last two years, or it was the same variety that too conformed to the seed certification standards.

## Isolation Distance

The seed plot should be isolated from other varieties or cross compatible crop to avoid genetic as well as physical contamination. This separation of the seed plots is called isolation distance. Depending upon the pollination behavior different isolation distances are prescribed for various field crops in the Indian Minimum Seed Certification Standards. Moong, urd and cowpea are self pollinated and only isolation of merely 10m is sufficient. Pigeonpea is an often cross pollinated crop and isolation distance required is 200 and 100m for foundation and certified seeds, respectively.

## Class of Seed

Seed used for growing the seed crop is one of the most important factors in quality seed production. So generation system should be followed i.e. breeder seed --- foundation seed— certified seed. Seed production by use of genetically pure seed will be easy and cost effective as less rouging will be required.

## Seed rate and Spacing

Sowing of pigeonpea should be done in rows spaced 60cm apart. Five kg seed will be sufficient for sowing in one acre. In case of moong line to line spacing should be kept 20-25 cm in summer sowing and 30 cm in kharif sowing. Seed rate of 10-12 kg per acre in summer and 8-10 kg per acre in kharif will provide a good plant stand. If seed size is very bold the seed rate must be increased accordingly.

## Sowing Time

Best sowing time for North Western Plains of India is given below for moong and pigeonpea.

<b>Moong</b>	Summer crop	Second fortnight of March
	Kharif crop	First fortnight of July
	Late Kharif crop	Up to 20 <sup>th</sup> of August

**Pigeonpea** First fortnight of June

## Seed Certification Standards

The seed certification standards have been divided in to two i.e. seed standards and field standards. Different seed and field standards have been prescribed for certified as well as foundation seed production for various crops which are given below

### a) Field Standards: Isolation requirements

Crop	Contaminants	Minimum distance (meters)	
		Foundation	Certified
<b>Moong, Urd, Cowpea</b>	Fields of other varieties or fields of same variety not conforming to varietal purity requirements for certification	10	5
<b>Pigeonpea</b>	---do---	<b>200</b>	<b>100</b>

**b) Field Standards: Specific requirements**

Almost all the *kharif* pulse crops have similar specific field requirements. The standards are given below

Factor	Maximum permitted (%)	
	Foundation	Certified
Offtypes	0.10	0.20
Plants affected by seed borne diseases (only for moong and cowpea)	0.10	0.20

**c) Seed Standards**

Factor	Standards for moong, urd and pigeonpea		Standards for cowpea	
	Foundation	Certified	Foundation	Certified
Pure seed (minimum)	98 %	98 %	98 %	98 %
Inert matter (maximum)	2%	2%	2%	2%
Other crop seeds (maximum)	5/Kg	10/Kg	0/Kg	10/Kg
Weed seeds (maximum)	5/Kg	10/Kg	0/Kg	10/Kg
Other distinguishable varieties (maximum)	10/Kg	20/Kg	5/Kg	10/Kg
Germination (minimum)	75%	75%	75%	75%
Moisture (maximum)	9%	9%	9%	9%

**Rouging**

Removal of offtype plants is rouging. Timing of rouging is very important. Rogues must be removed before flowering particularly in cross pollinated (CP) and often CP crops. Otherwise off types should be removed as and when detected for purity of seed. The uprooted plants should be thrown out of the seed plot otherwise they might be threshed along with the seed crop and may cause contamination.

**Harvesting and Threshing**

The seed crop should be harvested at proper maturity. In over mature crops, shattering of pods may take place. Special care should be taken during transportation of harvested crop from field to threshing floor and during threshing to avoid any admixture. The trolley used for this purpose should be thoroughly cleaned. Threshing should be done after thorough drying and with proper speed of thresher. Pulses because of being dicotyledonous, are very sensitive to splitting of seed if not handled carefully.

Seed bags/seed bins to be used for storage should also be thoroughly cleaned. Infestation of storage insects generally starts in the field itself. So the seed should be fumigated before processing and/or storage.