

Participatory Varietal Selection (PVS)



Participatory Varietal
(or Variety) Selection is a
selection among fixed lines
by farmers under target
environment.

Stages

- Participatory evaluation to identify farmers' needs in a cultivar
- A search for suitable material to test with farmers
- Experimentation on acceptability of suitable material in farmers' fields
- Wider dissemination of farmer-preferred cultivars

Experimentation on acceptability of suitable material in farmers' fields

1. Mother trials
2. Baby trials
3. Informal research and development (IRD)

Post-harvest studies:

1. Organoleptic tests for food crops
2. Analysis of other quality traits like nutrition analysis

Mother Trial: Unreplicated- Planning and Execution

Planning

1. Number of trials/site: Assured-**15** (Rainfed-**25**)
2. Number of varieties/trial: **8-10**
3. Number of hamlets/village: **>2**
4. Number of trials/village: **2-3**
5. Area of the selected site: **40sqm** per variety / **320-400sqm** net plot
6. Border area of the selected site: 1m on each side; 50 cm between plots
7. Data collection:

Experimental details:

- Entries (varieties tested), field layout and allotment of entries to the plots
- Cultural operations (land prep to threshing)
- Observations of the crop stand, performance, incidence of stresses (biotic, abiotic)
- Growth parameters
- Yield data, feedback of the trial farmer

Growth parameters for Small Millets:

- Plant population
- Days to 50% flowering
- Plant height
- Number of productive tillers
- Earhead size (panicle length)

Execution

Methods:

- Matrix ranking
- Farmers' Preference Analysis (FPA)

Farmers' Preference Analysis (FPA)

- Farmers **VOTE** for their preferred variety during a field day in mother trial just before harvesting
- **10-12** farmers in each group to have a FGD to clarify the voting results
- Farmers get **3** tokens of different colour (to identify first, second, and third ranked (preferred) varieties; first rank=5; second rank=3; third rank=1)

Matrix ranking

- Make a matrix with the traits in the first column, names of the varieties in the first row (cards or symbols can be used for convenience to represent the varieties)
- Supply the participants with a fixed number of seeds (like beans) to express their ranking of traits
- Let the participants rank the varieties for each trait by placing the seeds in the intersection of the column and row (1 seed = low/bad, and 5 seeds = high/good)
- Calculate weighted ranking of varieties (value for the trait x ranking score for that trait for each specific variety).

Baby Trial

Baby Trial

Conducted to validate the performance of identified varieties from mother trials by comparing performance of each one of them with the prevailing farmers' variety across the site. It is the second cycle in the PVS process.

- Includes 1-2 promising varieties identified from the Mother Trial. These entries form the 'test varieties'.
- Farmer's variety form the 'check variety'.
- Test varieties and the check variety are grown side-by-side.
- Site selection for each variety: 400sqm.

The varieties selected in baby trial are recommended for **Informal Research and Development (IRD)**.

Good Agricultural Practices

Common practices for millets

- **Land Preparation:** Plow 2-3 times (primary and secondary cultivation) and level the field to prepare ridges (30 cm apart) and furrows or raised (15cm) broad beds of 1.5 m width
- **Sowing:** Onset of irrigation under rainfed conditions. Line sowing either on ridges or on a broad bed -4 kg/acre or 10 kg/ha Broadcasting is not preferred as yields are low. If needed- 15 kg/ha seed.
- **Sowing method:** Ridge and furrow/ Broadbed
- **Spacing:** 30 x 10cm (30cm between the rows, 10cm within the row)
- **Seed treatment:** Propiconazole @ 1ml/kg seed
- **Fertilizer application:** Farmyard manure (FYM) or compost @ 5 t/ha is preferable
- **Ensure proper drainage**
- **Weed management:** After primary cultivation, irrigate the field to allow the weeds to germinate. Wait for 15 days and cultivate the field to prepare for sowing. This way, weeds can be prevented for up to two weeks. Manual weeding at 20-25 DAS followed by an interculture operation at 40 DAS.
- **Irrigation:** Timely irrigation is necessary
- **Harvesting:** The produce should be allowed to dry to reduce the moisture content of the seed to around 12%. The seed can be released by 1) threshing using threshers, 2) trampling by animals or manually by beating the heap with a stick on a threshing floor.

Crop specific- Good Agricultural Practices

Finger millet

- **Fertilizer:** N:P2O5:K2O- 40:20:20 or Urea: SSP:MOP – 88:125:32 kg/ha. Apply 50% of N, and a full dose of P and K as basal fertilizer. The remaining 50% of N can be applied during the vegetative phase (30 DAS) as top dressing.
- **Blast:** Seed treatment with Propiconazole @ 1ml/kg . Spray Propiconazole @ 1 ml/l of water.
- **Stem borer:** Chlorantriniprole @ 1 ml/3 l of water.
- **Armyworms or cutworms:** dusting of Phasolone 5% @ 24 kg/ha.
- **Harvest:** Manual when 80% panicle turns yellow.

Proso millet

- **Fertilizer:** N:P2O5:K2O- 40:20:0 or Urea: SSP:MOP – 88:125:0 kg/ha. Apply 50% of N, and a full dose of P as basal fertilizer. The remaining 50% of N can be applied during the vegetative phase (30 DAS) as top dressing.
- **Head smut:** Seed treatment with Ceresan @ 3g/kg or soaking in hot water at 55°C for 7-12 minutes.
- **Shoot fly:** 15kg Thimet granules/ha.
- **Harvest:** Manual when two-third of panicle is ripe to avoid shattering of the seeds.

Little millet

- **Fertilizer:** N:P2O5:K2O- 20:20:0 or Urea: SSP:MOP – 44:125:0 kg/ha. Apply 50% of N, and a full dose of P as basal fertilizer. The remaining 50% of N can be applied during the vegetative phase (30 DAS) as top dressing.
- **Shoot fly:** 15kg Thimet granules/ha.
- **Harvest:** Manual when 80% panicle turns yellow.

Foxtail millet

- **Fertilizer:** N:P2O5:K2O- 40:20:20 or Urea: SSP:MOP – 88:125:32 kg/ha. Apply 50% of N, and a full dose of P and K as basal fertilizer. The remaining 50% of N can be applied during the vegetative phase (30 DAS) as top dressing.
- **Blast:** Seed treatment with Propiconazole @ 1ml/kg . Spray Carbendazim @ 0.1% or Tricyclazole @ 0.05% during crop period
- **Armyworms or cutworms or shoot fly:** Chlorantriniprole @ 1 ml/3 l of water..
- **Harvest:** Manual when 80% panicle turns yellow.

Kodo millet

- **Fertilizer:** N:P2O5:K2O- 40:20:0 or Urea: SSP:MOP – 88:125:0 kg/ha. Apply 50% of N, and a full dose of P as basal fertilizer. The remaining 50% of N can be applied during the vegetative phase (30 DAS) as top dressing.
- **Head smut:** Chlorothalonil or Mancozeb - 2g/kg seed
- **Shoot fly:** 15kg Thimet granules/ha.
- **Harvest:** Manual when seeds turns golden-yellow or light brown colour.

Barnyard millet

- **Fertilizer:** N:P2O5:K2O- 40:20:20 or Urea: SSP:MOP – 88:125:32 kg/ha. Apply 50% of N, and a full dose of P and K as basal fertilizer. The remaining 50% of N can be applied during the vegetative phase (30 DAS) as top dressing.
- **Head smut:** Carbendazim at the rate of 2.5g/kg seed
- **Shoot fly:** 15kg Thimet granules/ha.
- **Harvest:** Manual when two-third of panicle is ripe.