
Pearl Millet Variety TSPM 91018



- Medium height (1.8-2.8 m)
- Matures in 87-92 days
- Medium to large straw-colored obovate seeds
- Long panicles (34-55 cm)
- Recommended for Tanzania's semi-arid regions, particularly the Central Plateau



ICRISAT

Plant Material Description no. 63

International Crops Research Institute for the Semi-Arid Tropics
Patancheru 502 324, Andhra Pradesh, India

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Purpose of description

TSPM 91018 was released as Okoa in 1994 by the Ministry of Agriculture and Livestock Development, Government of Tanzania, for general cultivation in the country.

Origin and development

TSPM 91018 was developed by the Southern African Development Community (SADC)/ICRISAT Sorghum and Millet Improvement Program (SMIP) at Matopos Research Station, Zimbabwe, from a local germplasm population, Halale. Eighteen accessions, including Halale, were identified in a yield trial involving 961 populations during the 1988/89 cropping season. Sibbing of selected progenies of Halale was done in an isolation block in 1989/90. In 1990, Halale was further treated as a composite population in an off-season nursery and 200 S₁ progenies were selected for evaluation in a nonreplicated nursery in 1990/91. The top-yielding 7.5% (15) progenies were recombined by hand-sibbing in a diallel fashion to constitute TSPM 91018 in the 1991 off-season. TSPM 91018 was progressively improved from 1991 to 1993. Plant-to-plant crosses of high-tillering, and long-panicled synchronous-tillering plants were made in the 1992 cropping season. Bulk pollen from selected plants was crossed on to each of the plants and 300 crosses were separately harvested. During the 1992 off-season, selected plants were sown as progeny in rows alternating with a bulk constituted from all progenies. Pollen from bulk rows was crossed on to plants in progeny rows and the crosses were harvested and bulked together. In 1993, harvested crosses were random-mated in isolation. Weaker plants were eliminated. Seeds of TSPM 91018 were multiplied under irrigation in an isolation block during the 1993 off-season. It took seven generations (3.5 years) of recurrent selection to constitute TSPM 91018 from its original germplasm population.

Synonym. Okoa

Performance

TSPM 91018 was widely tested for grain yield and resistance to major pests and diseases in Tanzania at 17 research stations and in farmers' fields (21 sites) for 4 years (Tables 1-3).

Table 1. Mean grain yield of TSPM 91018, Serere 17, and the local cultivar, on-station trials, Tanzania, 1991-94.

| Variety | Mean grain yield (t ha ⁻¹) | | | | | Number of sites | Superiority over Serere 17 (%) | Superiority over the local cultivar (%) |
|----------------|--|------|------|------|------|-----------------|--------------------------------|---|
| | 1991 | 1992 | 1993 | 1994 | Mean | | | |
| TSPM 91018 | 1.91 | 2.61 | 2.12 | 1.92 | 2.14 | 14 | 49.6 | 47.6 |
| Serere 17 | 1.17 | 1.67 | 1.29 | 1.59 | 1.43 | 17 | - | -1.4 |
| Local cultivar | 1.20 | 1.68 | 1.24 | 1.67 | 1.45 | 17 | 1.4 | - |

Table 2. Plant characteristics and grain yield of TSPM 91018, Serere 17, and the local cultivar, on-farm trials, Tanzania, 1991-94.

| Variety | Days to flowering ¹ | Plant height ¹ (cm) | Panicle length ² (cm) | Ergot score ³ (1-9) | Mean grain yield ⁴ (t ha ⁻¹) |
|----------------|--------------------------------|--------------------------------|----------------------------------|--------------------------------|---|
| TSPM 91018 | 62 | 198 | 43 | 1.58 | 2.31 |
| Serere 17 | 53 | 175 | 24 | 1.71 | 1.62 |
| Local cultivar | 67 | 211 | 36 | 2.00 | 1.62 |

1. Based on an average of 17 sites.

2. Based on an average of 11 sites.

3. Based on an average of 16 sites. Downy mildew and smut incidences were insignificant on all entries in these trials.

4. Based on an average of 21 nonreplicated sites.

Table 3. Grain quality characteristics of TSPM 91018, Serere 17, and the local cultivar.

| Variety | Size fraction ¹ (%) | | | 1000-seed mass (g) | Dehulling loss (%) | Milling yield (%) | Dry Agron |
|----------------|--------------------------------|--------|-------|--------------------|--------------------|-------------------|-----------|
| | Large | Medium | Small | | | | |
| TSPM 91018 | 33.50 | 66.38 | 0.08 | 13.3 | 11.20 | 86.90 | 58.30 |
| Serere 17 | 82.16 | 17.58 | 0.17 | 15.4 | 9.30 | 87.80 | 41.10 |
| Local cultivar | 1.28 | 93.50 | 5.18 | 7.5 | 7.80 | 79.10 | 50.20 |

1. Large = >2.6 mm; medium = 1.7-2.6 mm; small = <1.7 mm.

The newest improved version of the variety was evaluated each season. Overall, TSPM 91018 was 49.6% superior to the improved control Serere 17 and 47.6% superior to the local cultivar.

Plant characters

TSPM 91018 is medium-tall (1.8-2.8 m) with a stem diameter of 35-40 mm. Its plant spreads out during the first 3 weeks after which it assumes an erect posture, developing an average of 3-4 productive tillers per plant. It flowers in 55-60 days and matures in approximately 87-92 days. It has green leaves which are 49-75 cm long and 4-7 cm wide. Its panicles are long (34-55 cm), cylindrical, loose, and nonbristled. Panicle girth span is 7-11 cm.

Seed characters

The grain is bold, obovate, and straw-colored with a medium to hard endosperm. The average mass of 1000 seeds is 11.2-13.8 g. Seed dormancy and tolerance for mold when ripening in humid conditions are adequate.



ICRISAT
Plant Material Descriptions
from the
International Crops Research Institute for the Semi-Arid Tropics

Brief descriptions of crop genotypes identified or developed by ICRISAT, including:

- germplasm accessions with important agronomic or resistance attributes
- breeding materials, both segregating and stabilized, with unique character combinations
- cultivars that have been released for cultivation.

These descriptions announce the availability of plant material, primarily for the benefit of the Institute's cooperators. Their purpose is to facilitate the identification of cultivars and breeding lines and to promote their wide utilization. Requests for seed should be addressed to the Director General, ICRISAT, or to appropriate seed suppliers. Materials for research are sent by ICRISAT to cooperators and other users free of charge.