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# EFFECT OF TIME OF HARVEST AND DECORTICATION OF PODS ON VIABILITY AND VIGOUR IN GROUNDNUT

V. RAMAKRISHNAN[1] and T. V. KARIVARATHARAJU[2]

The study indicated that the mechanical decortication of groundnut cv. CO 1 pods whether sun-dried or shade-dried before mechanical decortication should be re-hydrated to about 16% moisture conent to minimise mechanical injury and secure high germination from the separated seed.

In countries producing groundnut the pods as such are carried over under ambient temperature and relative humidity after adequately drying them until the seeds contained within rattle and packing in jute or hessain bags. While in storage until the next sowing season, they are protected against the predations by rodents and insects. Then, prior to planting they are mechanically shelled to separate the seeds and graded to remove the diseased, discoloured, broken and immature ones. Breakage of seeds during mechanical decortication of the pods will be considerable, if the pods are very dry. As mentioned already, the peculiar shape and placement of the embryonic axis and massive cotyledons with fragile and thin seed coat render the seed vulnerable to mechanical impaction, resulting in the breaking of seeds into pieces, cracked or datached cotyledons while still being held within the undamaged seed coat. In order to mitigate such machanical injuries and the consequent serious loss of seeds, the pods are rehydrated just before decortication and if this ameliorative rehydration treatment to dry pods, when given excess of the optimum regime, is likely to cause bruises, compress the seeds, enhance the production of free fatty acids and promote rapid loss of membrane integrity and viability during the subsequent storage period from shelling to planting. Hence, the need to standardize the process of rehydration, and decortication, besides the post-decortification drying of seeds to safe moisture level, if necessary, to carry over them until next sowing.

The dried pods obtained from an experiment involving three harvesting treatments namely harvesting the pods 110 days after sowing (Control-I harvest), 100days after sowing (II harvest) and 120 days after sowing (III harvest), were hydrated to 12, 14 and 16 per cent moisture contents. The pods were decorticated in a mechanical decorticator to separate the kernels. Then the seeds were moisture equilibrated with the ambient relative humidity for a week and divided into two sub lots. One lot was subjected to accelerated ageing for seven days and moisture equilibrated for seven days. They were tested for germinability by standard germination test (ISTA, 1976) and topographical tetrazolium test (ISTA, 1976).

Department of seed Technology, Tamil Nadu Agricultural University, Coimbatore-641003.

Table. 1. Germination percentage as influenced by moisture content during decortication

| | Harvest x Set | | | Harvest x Drying | | Set x Drying | | |
|---|---|---|---|---|---|---|---|---|
| | I Set (Shelled at 12% m. c.) | II Set (Shelled at 14% m. c.) | III Set (Shelled at 16% m. c.) | Sun | Shade | | Sun | Shade |
| I harvest | 188.64 | 224.02 | 231.87 | 302.37 | 342.16 | ISet (Shelled at 12% m.c.) | 278.8 | 273.93 |
| II Harvest | 168 56 | 159.6 | 218.08 | 275.96 | 270.28 | IISet (Shelled at 14% m.c.) | 252.28 | 311.34 |
| III Harvest | 195 53 | 180.0 | 228.81 | 290.88 | 313.51 | IIISet (Shelled at 16% m.c.) | 338 08 | 340.68 |

| | Harvest | Set | Drying | Harvest x Set | Har. x Drying | Set x Drying |
|---|---|---|---|---|---|---|
| SED | — | 3.91 | — | — | — | — |
| CD | NS | 8.11* | NS | NS | NS | NS |

Table 2. Germination percentage after accelerated ageing as influenced by moisture content during decortification.

| | Harvest x Set | | | Harvest x Drying | | Harvest x Treatment | | Set x Treatment | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | I Set | II Set | III Set | Sun | Shade | Control | Treat-ment | | Control | Treatment |
| I Har. | 24.08 | 24 01 | 32.52 | 45.09 | 35.52 | 30.28 | 50 33 | I set | 32.83 | 40.55 |
| II Har. | 27.83 | 17.04 | 25.06 | 30.06 | 40.47 | 36.43 | 34.10 | II set | 26.46 | 36.65 |
| III Har. | 21.46 | 21.46 | 39.66 | 41.34 | 41.24 | 35.45 | 47.13 | III set | 42.87 | 54.37 |

| | Har. | Set | Drying | Treat. | H x S | H x D | H x T | S x D | S x T | D x T |
|---|---|---|---|---|---|---|---|---|---|---|
| SED | 0.187 | 0.187 | — | 0.15 | 0.32 | 0.26 | 0 26 | — | — | — |
| CD | 0.375* | 0.375** | NS | 0 30** | 0.65** | 0.53** | 0.53** | NS | NS | NS |

Table. 3. Tetrazolium rating in per cent as influenced by moisture content during decortication

| | Harvest x Set | | | Harvest x Drying | | Set x Drying | | |
|---|---|---|---|---|---|---|---|---|
| | I Set | II Set | III Set | Sun | Shade | | Sun | Shade |
| I Har. | 179.44 | 125.71 | 283.73 | 275.98 | 312.95 | I Set shelled at 12% | 236.01 | 323.83 |
| II Har. | 161.54 | 56.09 | 164.72 | 175 99 | 207.36 | II set shelled at 14% | 91.1 | 192.92 |
| III Har. | 218.86 | 101.22 | 200.50 | 238.50 | 282.01 | III set shelled at 16% | 363.31 | 285.57 |

| | Har. | Set | Drying | Har. x Set | Har. x Drying | Set. x Drying |
|---|---|---|---|---|---|---|
| SED | 2.38 | 2.38 | 1.949 | 4.135 | — | 3.37 |
| CD | 4.93** | 4.93** | 4.04** | 9.57** | NS | 7.003* |

Table. 4. Germination percentage of captan treated seeds after accelerated ageing as influenced by moisture content during decortication

| | Harvest x Set | | | Harvest x Drying | | Harvest x Treatment | | Set x Treatmen | |
|---|---|---|---|---|---|---|---|---|---|
| | I set | II set | III set | Sun | Shade | Control | Treatment | Control | Treated |
| I Har. | 24.08 | 24i01 | 32.52 | 45.09 | 35.52 | 30.28 | 50.33 | I set 32.83 | 40.54 |
| II Har. | 27.83 | 17.64 | 25.06 | 30.06 | 40.47 | 36.43 | 34.13 | II set 26.46 | 36.64 |
| III Har. | 21.46 | 21.46 | 39.66 | 41.34 | 41.24 | 36.45 | 47.14 | III set 42.87 | 54.37 |

| | Har. | Set | Drying | Treat | H x S | H x D | H x T | S x D | S x T | D x T |
|---|---|---|---|---|---|---|---|---|---|---|
| SED | 0.187 | 0.187 | — | 0.15 | 0.32 | 0.26 | 0.26 | — | — | — |
| CD | 0.375* | 0.575** | NS | 0.30** | 0.65** | 0.53** | 0.53** | NS | NS | NS |

## RESULTS AND DISCUSSION

The results of germinability testing of seeds without accelerated ageing indicated that the seeds from pods mechanically decorticated at 16 per cent moisture content recorded significantly high germination indicating that they suffered less mechanical damage than the seeds from pods decorticated at low moisture contents. Kantor and Webster (1967) and Brahmanand and Biswas (1974) observed that the low moisture seeds suffered more mechanical injury during processing and this reduced the germination and vigour potential of seed more severely. The viability of seeds indicated by the topographical tetrazolium test indicated that the seeds harvested 110 days after sowing and decorticed at 16% moisture content were highly germinable. Among the methods of drying, shade drying was relatively good. The interactions revealed that pods harvested 110 days after sowing, shade-dried and decorticated at 16% moisture gave highly germinable seeds.

The results of germinability testing after artificially ageing the decorticated seeds and with and without treating them with thiram 75% WDP clearly revealed that the seeds from pods harvested 130 days after sowing possessed relatively high germinability. The seeds obtained from pods decorticated at 16% moisture content germinated better than those decorticated at 14 and 12% moisture content. The treated seeds recorded relatively high germination. The interactions revealed that (a) the seeds from pods harvested 130 days after sowing, decorticaed at 16% moisture content were highly germinable. The seeds from pods harvested 110 days after sowing, sun-dried and treated with thiram were highly germinable.

## REFERENCES

BRAHMANAND and D. K. BISWAS, 1974. Studies on impact damage to wheat seeds. *F. Agril. Engg. 11*: 9—13.

ISTA, 1976. International rules for Seed Testing. *Seed Sci. and Technol.* 4: 3—49.

KANTOR, D. J. and O. J. WEBSTEll. 1967. Effects of freezing and mechanical injury on viabiiity of sorghum seed. *Crop Sci.* 7: 196.