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“Bridging the gap between increasing knowledge and decreasing resources”

## Overcoming Seed Germination Problems of Traditional Vegetables after Cold Storage

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### Abstract

The experiments described here address the constraints of hard-seededness of fresh and stored seed of okra (*Abelmoschus esculentus* (L.) Moench) and water spinach (*Ipomoea aquatica* Forssk.). Freshly harvested fruits of two water spinach and two okra accessions were dried for two weeks in a screenhouse prior to manual seed extraction and cleaning. Cleaned seed was dried to 6 % seed moisture content in a dehumidified drying room for 8 days at 18°C and 15 % RH. The two accessions of both crops showed a marked difference in initial germination rate prior to storage. The water spinach accession from Thailand (VI050476) had a very low initial germination rate of 4 % compared to 77 % for the accession from Taiwan (VI054533). Okra seeds of an accession from Thailand (VI046536) had an initial germination rate of 26 % compared with 90 % for the accession from Zambia (VI050598). Seed priming was conducted after 6 months of storage at 5°C and -15°C. The germination rate of water spinach seed from Thailand (VI050476) remained very low at 4 % and 1 % after 6 months of storage at 5°C and -15°C, respectively (T1; control). Partial removal of the seed coat followed by 24 h soaking in water (T3) elevated the germination rate substantially to 82 % and 85 % after 6 months of storage at 5°C and -15°C, respectively. The germination rate of seed from Taiwan (VI054533) increased from 77 % prior to storage to 92 % and 93 % after 6 months of storage at 5°C and -15°C, respectively. Seed priming of the latter did not have any additional beneficial effect on the germination rate. Storage temperature of okra seed had a major impact on the germination rate. While the germination rate of seed stored for a 6-month period at 5°C was low for the accessions from Thailand (18 %) and Zambia (20 %), the germination rate reached 99 % and 96 %, respectively, when seed was stored at -15°C. Seed priming was highly beneficial for seed stored at 5°C (T3), but was not required when seed was stored under sub-zero temperatures.

**Keywords:** Cold storage, germination rate, hard-seededness, okra, seed priming, water spinach