Asian J. of Bio Sci. (2007) Vol. 2 No. 2 : (201-204)

Article :

Seed viability and factors affecting seed storage

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(Accepted : June, 2007)

For most seed technologists and commercial seedmen, viability means that a seed is capable of germinating and producing normal seedlings. Viability denotes the degree to which a seed is alive, metabolically active and posses enzymes capable of catalyzing metabolic reactions needed for germination and seedling growth. This meaning deals with tissue viability as well as viability of the entire seed. Seed viability is probably highest at the time of physiological maturity though environmental conditions on the apparent plant may not permit germination. After physiological maturity, the viability of seed gradually declines.

Numerous Tests exist for determining seed viability, these are as follows:

Tetrazolium test (TZ test):
The tetrazolium tst distinguishes between viable and dead tissues of embryo axis on the basis of their relative respiration rate in hydrated state.

Vital coloring methods
i) Enzyme activity method.
ii) Oxidase method-I catalyse
iii) Oxidase method-II peroxidase
iv) Conductivity test
v) Excised embryo test
vi) X-ray tests
vii) Free fatty acidity tests

Majority of seed species are orthodox and confirm to certain thumb rules predict well to pattern of loss of viability in relation to storage environment. The basic viability equations are reasonably accurate for predicting viability percentage from a few days to several years.

Factors affecting seed viability :
Cultivars and Harvest Variability :
Different cultivars and harvest of a species may show different viability characteristics under the same storage conditions. Significant differences in viability period exist between genotypes within a species.

Initial viability :
It has been established that healthy, well mature seed with high initial germinating capacity will retain viability for longer period than that of seeds having low initial germinating capacity.

Preharvest and post harvest conditions:
The stage of maturity at harvest was found to influence both viability and longevity of the seed . The seeds harvested at pre milk stages were inferior in most instances in both viability and longevity to seeds harvested in e4ither the dough or mature stages.

Treatment to which seeds are subjected around harvest time may affect subsequent loss of viability. Mechanical injuries inflicted during harvesting can severely reduce the viability of some seeds e.g. Large seeded legumes.

The presence or absence of surrounding structures of the seed during storage itself can influence viability. E.g. Cereal grains with intact hulls retain viability longer than those threshed before storage.

Injuries those to vital parts of the embyo0nic axis usually bring bout more rapid loss of viability during storage than the injuries that located elsewhere.

Elevated temperature during drying too quick or excessively can reduce viability. It is often necessary to resort to artificial drying before storage if viability is to retain for a long period.

Moisture content of the seed at the time of storage is a very important factor that affects seed viability. The general range specified for the safe moisture content for various orthodox seeds is 9 to 12% accept paddy, which should be at 15%.

At higher moisture content storage fungi and store grain pests will attack it or at very low moisture content seed may loss its viability.

At low temperature and moisture content in the seed, the metabolic activity of the seed particularly respiration

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