## Seed Viability

The viability of the seed in the field will be determined to a large degree from its stored moisture level, germination potential and its vigour.

* *‘Moisture content’* has a marked influence on the life and vigor of the seed. Moisture content should be less than 14% and preferably less than 12% for extended storage times.
* *High germination and vigour***:** The germination percentage is an indicator of the ability of the seed to emerge from the soil to produce a plant in the field under normal conditions. Seed vigour is the capacity of seed to emerge from the soil and survive under potentially stressful field conditions and to grow rapidly under favourable conditions. The loss of a seed’s ability to germinate is the last step (not the first step) in a long process of deterioration (gradual loss of viability). Decrease in seed vigour and other physiological changes happen before loss of germination. Therefore seed with acceptable germination can be low in vigor.

The importance of physiological quality cannot be over emphasized. Seed can only fulfill its biological role if it is viable. Therefore, physically uniform seed of an adapted variety will be useless if it is low in germination and vigour or if it fails to germinate when planted. ***The difference between grain and seed is that the former may or may not germinate while the latter must germinate*.** This is why the germination, particularly high percentage of it, is such an important technical specification for seed.

*‘Germination percentage*’ *or capacity* expresses the proportion of the total number of seeds that are alive. It is determined through controlled tests and actual counts of the number of seeds that germinate. Many varieties have a dormancy period immediately after harvest. Stored under traditional open systems the germination rate of most rice seed begins to deteriorate rapidly after 6 months.

‘*Seed vigor’* provides a very good estimate of the potential field performance and, subsequently, the field planting value. While the speed of germination varies slightly across varieties, seeds should imbibe (absorb) moisture and within 2 days produce a root (radicle) and the first leaf (plumule) within 4 days. At this point the seed is considered to have germinated. The ability of the germinating seed to continue to grow and survive then determines crop establishment. Seed vigor has been defined as the sum total of those properties of the seed, which determine the level of activity and performance of the seed during germination and seedling emergence. Seed vigor is an important factor that often results in poor seedling establishment. Seeds low in vigor generally produce weak seedlings that are susceptible to environmental stresses. Whereas, a high level of vigor in seeds can be expected to provide for early and uniform stands which give the growing seedlings the competitive advantage against various environmental stresses.