



STUDY OF SAFE STORAGE OF CROP SEEDS WITH SPECIAL REFERENCES TO ABIOTIC AND BIOTIC CONDITIONS

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Abstract :- Green revolution in our country is succeeded and we achieved the target of grain production to a greater extent. Now the future course of action is to minimize the loss of grains in crop field and in godown. Storage of grain/crop seeds in adverse environments conditions will not only damage the quality of crop seeds but also reduce the weight of store seeds to the considerable extent. High moisture contents of seeds, high percentage of relatives humidity, high temperature and storing for a long period are the factors responsible for detrition of crop seeds. Each and any one of above cited factors can damage the seed lots in the store. Study through various experiments reveals that the moisture content of crop seeds at 9% if stored at 20% temperature and 60% relatives humidity the seeds in store remain intact and fit for sowing in field and also for marketing. These two factors high temperature and high R.H. level raise the magnitude of electrical conductivity leaching of sugar , amino acid and enzymes etc and stored seeds become unhealthy, unfit and unviable.

The injured and leachate seeds lost fully or partial germination. Fungal and microbial infestation occur and the plasma membrane of seed lots get damaged and cause on interrupted leaching of chemicals and such crop seeds normally fail to germinated. If before storing of crop seeds, all this adverse factors are eliminated, investment of money, time and labour can be saved.

Keywords :- Abiotic, Biotic, Relative humidity, infestation, cellular integrity, Plasma membrane phospholipids etc.

Today the national thrust is to enhance income of farmers. Our hon'ble Prime Minister in his speech in the Parliament and also in press conference has undertaken to double the income of farmers. The task is not easy and can only be achieved when each and every



factors to raise income is taken care of. The technology of Agricultural production and their safe storage is used so that farmers may have their own viable and healthy seeds to raise next crop in coming season. The, disease free, unleachate seeds may produce more grains and finally enhance income of the farmers and the national objects will be achieved.

During study, it is observed that the main reasons of deteriorations of crop seeds in the storage are of two fold, The 1st is Abiotic and the other is Biotic. Abiotic refers to all those environment conditions which cause damage to the store seeds. They are high relative humidity (R.H), higher temperature more moisture content and prolonged storage. The Biotic factors refers to attack of insect pest write from crop field to storage and microbial infestation to crop seeds in the store itself. Several species of *Aspergillus* prevailing in warm and humid reasons damage the seed membrane and leaching of electrolytes, sugar, aminoacid, and other inorganic compounds starts. Thus the quality of crop seed deteriate and unviable, unfit for showing.

Different studies on crop seeds at veying temperature, different percentage of humidity and periodicity of storage reveals that the seed lots when stored carelessly without maintaining the required humidity, temperature and moisture percentage of crop seeds increase and infection of fungal & microbials starts. Leachate of crop seeds begins resulting poor germination, slow growth of seedlings and vigour of plants suppressed and finally the yield is reduced and the farm income remain unprofitable. Crop seeds stored at 60% R.H. may have lesser moisture contents in the seed than compared to seeds stored at 80% humidity. The high temperature and higher humidity damage the membrane of seeds and then leaching starts. The degeneration of membrane may be due to loss of metabolic energy for membrane transport mechanism & maintenance of cellular integrity of stored seeds. The loss of phospholipid of membrane may change the proteins embedded in the lipid bilayer. Membrane damage may cause the mitochondria plasma membrane and other cellular damage and finally the germination of seeds, growth of seedlings and vigour of crop is stunted. Storage of crop seeds at various temperatures reveals that the value of electrical conductivity of the Leachate seeds is minimum at 20°C and maximum at 40°C. When the period of storage at a particular temperature is extended, the value of electrical conductivity of Leachate seed is increased. It is also observed



that the moisture content of the seed is increased as the level of R.H. increases. Moisture content is at minimum when stored at 60% humidity and maximum at 80% of humidity. After conducting various experiments it is proved that if R.H percentage of store is raised from 60 to 80% there happens the gradual loss of germination percentage. It is true for all the period of storage and for all crops seeds. When period is extended from 15 to 45 days keeping R.H. constant there is proportionate decreases of germination. Storage of crops seeds at 60% R.H. for 15 days resulted the best percentage of germination. Seeds stored at 80% R.H. for prolonged period of 45 days resulted in the least percentage of germination. Likewise seeds stored at 11% moisture content at 20°C gives maximum result. When the R.H. level of store is increased the percentage of germination decreases. Similarly extension of storage period retards percentage of germination. The attack of insect pest either in field or at store injured the crop seeds and make them unfit and unviable. Infestation of microbials and fungus prevailing in warm and humid regions also damage the quality of seeds. In adverse environmental condition when seeds are stored for a longer period at higher temperature, seeds start leaching. The increased heat cause membrane damage and reduces enzyme content of seed. The high humidity, high temperature and long storage period directly hit the plasma membrane and deterioration of membrane leads to leaching of electrolytes, sugar, amino acid and other inorganic compounds. Leakage make the seeds unhealthy and unfit for raising crops. It result badly on the income of farming. Therefore utmost care be imposed to store crop seeds properly which will enhance income of the farmer as well as fulfil the national objectives.

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