

## STORING SOYBEAN PLANTING SEED FOR FUTURE USE

Fungicides and insecticides are applied to soybean planting seed to control early season diseases and insects. However, [proper disposal of treated soybean seed](#) requires special treatment, and disposing of rather than planting expensive soybean seed is an economic negative. Thus, storing unplanted seed for future use may be desired.

The storing option, of course, assumes that the viability and vigor of the stored seed will be maintained so that they can be planted the following season with the same expectation of achieving an acceptable stand as in the year of their purchase.

### PAST RESEARCH FINDINGS

- High temperature and relative humidity in a seed storage environment increase the rate of deterioration of seed.
- Seed that are subjected to fluctuating levels of moisture deteriorate faster than seed that are held in an environment with a constant moisture level.
- Fungi that are present on stored seed are a major cause of quality losses in those seed, and the extent of fungi-related deterioration is dependent on relative humidity.

### NEW RESEARCH

In an article titled “[Effects of Storage Temperature and Relative Humidity on Viability and Vigor of Treated Soybean Seeds](#)”, a group of Iowa State University scientists report results from a study that was conducted to determine storage environments that would minimize deterioration of treated soybean seed that are not planted in the season of their purchase. A brief description of the research and its findings follow.

#### Study Components

- 24 varieties from MG’s I, II, III, and IV;
- Seed treatments: 1) untreated; 2) treated with a fungicide [ApronMaxx]; or 3) treated with a fungicide + insecticide [CruiserMaxx];
- Storage environments: 1) non-climate-controlled

**warehouse** [18 to 82°F and 37 to 74% relative humidity]; 2) climate-controlled **cold storage** [51±1°F and 60±7% relative humidity]; or 3) climate-controlled **warm storage** [78±1.5°F and 31±11% relative humidity].

The [standard germination test](#) was used to evaluate **seed viability** and the [accelerated aging test](#) was used to measure **seed vigor** at study initiation and at 4-month intervals from 4 to 20 months after storage. Initial seed germination ranged from 95 to 99% and initial seed vigor ranged from 83% to 97%. Fungi present on seed were identified and counted before storage.

### Findings

#### Cold storage.

- Over the 20 months of the study, seed lots maintained their viability at 96%, 95%, and 92% for the fungicide-treated, fungicide + insecticide-treated, and untreated seed, respectively. Thus, germination did not significantly decline over the duration of the experiment when seed were kept in cold storage.
- After 12 months of storage, vigor of treated seed was >83% compared to 69% for vigor of untreated seed. After 16 months of storage, seed vigor of treated seed was ~70%.
- These results indicate that treated seed held in cold storage maintained both viability and vigor for 12 months. Thus, seed that are treated can be safely held in this environment for the next planting season.

#### Warm storage.

- Viability of both treated and untreated seeds was maintained at >90% through 16 months.
- After 12 months of storage, seed vigor was 72% for the treated seed and 61% for the untreated seed.
- Thus, both viability and vigor of treated seed will be acceptable for planting after being held in a controlled warm storage environment for 12 months.

#### Warehouse storage.

- After 12 months of storage in the warehouse environment, germination was ~90%, but vigor had



declined to <20%. Treating seed did not affect their ability to maintain either viability or vigor for 12 months when stored in the warehouse environment.

- These results indicate that seed that are not planted in the season of their purchase will be unsuitable for next year's planting if they are stored in the uncontrolled temperature and relative humidity conditions of a warehouse.

### **Take-Home Message**

- Soybean seed that are not planted can be safely held over for the next season's planting if they are kept in the controlled conditions of either cold or warm storage as defined above.
- Viability and vigor of seed that will be held over for next season's planting will be enhanced during both cold and warm storage if they have been treated with a seed-applied fungicide.
- Seed that are left over from the current season's planting will not maintain adequate viability and vigor for the next season's planting if they are stored in the uncontrolled conditions of a warehouse. For Midsouth soybean producers, this is especially poignant since the temperature and relative humidity conditions in the Midsouth likely will be harsher than those in the above Iowa study.
- Seed viability alone is not a good measure of seed quality after storage.
- Use of the above cold and warm environments for storing planting seed will depend on the value of the soybean seed to be stored.
- The above study does not address the economics of storing these seed vs. their purchase cost and/or disposal.

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