Ferric Chloride Test for Mechanical Damage to Legume Seed

Ed Hardin /1

Mechanical damage to legume seed can seriously reduce the quality of legume seed. Frequently minute cracks in the seed coat that are not visible will destroy the viability of the seed. This type of injury must be identified in the field if adjustments are to be made in equipment before the entire crop is damaged.

Research at the Oregon State University Seed Testing Laboratory has found that mechanically injured areas of legume seed turn black when placed in a solution of Ferric Chloride. This is a practical method of providing a farmer or warehouseman a quick estimation of the percent abnormalities he can expect in his crop. This on-the-spot check, with appropriate adjustments to equipment, could reduce damage to the remainder of the crop. The test is conducted as follows:

1. Prepare a 20% solution of Ferric Chloride (FeCl₃) by adding 4 parts water to 1 part FeCl₃ (reagent lump grade) by weight. The lumps of Ferric Chloride should be ground to a powder first. One-third cup Ferric Chloride powder in ½ pint water provides sufficient quantity to do numerous tests.

2. Count out at least two 100-seed samples and place them in dishes or saucers. If time permits, four-100 seed samples should be counted out to increase test accuracy.

3. Pour enough solution into each dish to completely cover the seeds. Be sure all seeds are totally submerged; however, a few light seeds may insist on floating.

4. Start to separate black staining seeds within 5 minutes after addition of the solution. Regardless of how small the black stain is, the seed should be separated. However, be sure that the stain is black and not a natural dark brown.

5. Continue to separate black seeds until 15 minutes after addition of the solution to the seeds. DO NOT SEPARATE SEEDS AFTER 15 MINUTES ARE UP.

/1 Coordinator, Seed Services, Oregon State University

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6. Count the number of black stained seeds.

7. The solution can be poured off, at the conclusion of the test, and saved for re-use.

8. The number of black seeds out of 100 is the percent of damaged seed. The lower percent of the black seed, the better.

9. Individuals will need to interpret amount of damage allowable in standards he desires to meet.

It must be kept in mind that seed in the machine hopper is not the same as the clean seed because some damaged seed is removed in the cleaning process. Experience will tell how to interpret the field examination.
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2. Count out at least two 100-seed samples and place them in dishes or saucers. If time permits, four 100 seed samples should be counted out to increase test accuracy.

3. Pour enough solution into each dish to completely cover the seeds. Be sure all seeds are totally submerged, however, a few light seeds may insist on floating.

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Seed Laboratory
Oregon State University
Corvallis, Oregon 97331