Quality and Appearance of Soybean Seed

- Soybean seed size and appearance can be affected by challenging growing conditions.
- However, soybean seed appearance normally does not affect quality. Seed that looks almost perfect can have poor germination percentage while seed that appears flawed may be very high in quality.
- Farmers should focus on germination rate and the ability of seed to produce a healthy seedling as they select seed for next season.

Environmental and disease issues from the previous growing season, combined with a few storage challenges since harvest, may have led to the poor appearance of some soybean seeds.

Figure 1. Purple seed stain is caused by Cercospora fungus. Effects on germination are slight and only occur when seed is completely purple.

Figure 2. Seed coat damage often takes place at harvest when seed is dry and humidity is extremely low. Chips, cracks and broken seed result from mechanical damage.

Figure 3. Growth marks usually result when the seed coat does not close completely. The cause is not entirely understood, but is believed to result when the seed embryo develops faster than the seed coat.

Common Soybean Appearance Problems

Environmental and disease issues from the previous growing season, combined with a few storage challenges since harvest, may have led to the poor appearance of some soybean seeds. However, poor appearance is not necessarily an indicator of poor quality. Likewise, almost perfect looking seed can have poor germination. Conditions such as drought, aphids, viruses and other pathogens, bean leaf beetles, and a quick harvest drydown may lead to various conditions that can cause poor seed appearance. Low harvest moisture can increase the chances of mechanical damage from handling during conditioning and packaging.

Rapid shutdown of soybean plants at harvest can create immature green seeds. Excess moisture in bins can contribute to surface mold on seed. Germination rate, not appearance, should be the focus as several conditions that cause poor seed appearance and surface mold do NOT affect germination.

Purple Seed Stain (Figure 1) is caused by the fungus Cercospora kikuchii and causes a purple seed discoloration. In cases with mild seed infection, the coat may be shed before seedling infection can occur. In more severe cases, it can be transmitted from the seed coat to the seedling as the seed germinates and infected seedlings may show a reduction in growth.[1] Soybean seed treatments can help prevent transmission of Cercospora to the germinating seedling.

Seed coat damage (Figure 2) can occur during harvest and the handling process when seed is dry and humidity is extremely low. Chips, cracks, and broken seed result from mechanical damage. Handling equipment should be designed to handle seed gently and to reduce mechanical damage. Conditioning equipment should remove most mechanically damaged seed during the cleaning process.

Seed coat development is influenced by genetic and environmental factors (Figure 3). Highly specialized cell layers within the soybean seedcoat rapidly change as the seed develops.[2] Genetic

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expression also changes during seed development and can be influenced by conditions in the environment.

Green coloring (Figure 4) can be found in areas where late-planted fields were hit by an early frost. The green tint occurs because the chlorophyll has not dissipated entirely. The coloring has no effect on quality if the seed is fully mature.

Figure 4. Green coloring can be found in areas where fields planted later than normal were hit by an earlier than normal frost.

Bleeding hilum, also known as seed coat mottling, can be caused by specific genetics, stresses during seed development, or by soybean mosaic virus. Bleeding hilum does not indicate that the virus is present in the seed. In most soybean seed products, transmission of the virus from seed to plant is lessthan 5%.[3]

Soybean Seed Treatments

Wet, poorly drained soils, common during spring planting and crop emergence, favor the development of the fungal pathogens that cause soybean seedling diseases. These diseases may slow germination and plant growth. Early-season insect pest feeding can damage soybean seeds and seedlings, which can cause adverse effects on plant growth. Seed treatments can help protect seed and seedlings from labeled pests, and result in more uniform plant stands, better yield potential, and ultimately an increase return on investment.

Bayer seed treatment products have been selected to help protect soybean seeds and seedlings from disease and insect damage. In the past, most seed treatments consisted of one or two active ingredients which primarily controlled seedling diseases. Bayer seed treatment products contain advancements in seed treatment technology, including multiple modes of action, and broad spectrum control of insects and diseases with increased length of protection.

Bayer seed treatment products can provide protection for the diseases Pythium, Phytophthora, Fusarium, and Rhizoctonia, and from key insects, such as bean leaf beetle, soybean aphid, seedcorn maggot, wireworm, and white grub. Protection from Bayer seed treatment products can last for up to 30 days. Bayer insecticide/fungicide seed treatment products for soybeans contain the fungicides pyraclostrobin for Fusarium and Rhizoctonia control, metalaxyl for Pythium and Phytophthora control, fluxapyroxad for control of Fusarium and Rhizoctonia, as well as the insecticide imidacloprid which provides both above- and below-ground insect protection.

For additional agronomic information, please contact your local seed representative. Individual results may vary, and performance may vary from location to location and from year to year. Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

Sources

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