Discoloration in Soybean Seed

Introduction

Soybean seed discoloration or damage can be caused by interactions of environment, insects, and diseases. Economic injury depends on the cause and timing of the causal agent. Discounts may occur at the elevator because of discoloration. Depending on the cause for seed discoloration, potential yield may not be impacted. However, discounts based upon quality and appearance may occur when the grain is delivered for market.[1]

Seed Discoloration Causes

Purple seed stain, also called Cercospora blight, is caused by the fungus *Cercospora kikuchii*. It is also known by the names purple blotch, purple speck, purple spot or lavender spot.[2] Infected seed is characterized by pink and varying depths of purple discoloration (Figure 1). The seed may have discolored specks to large blotches that cover the entire seed. Warm, humid weather favors fungi sporulation. Potential yield may not be reduced; however, under severe discoloration, dockage may occur. Along with seeds, Cercospora can also infect leaves, stems and pods.

Seeds infected with **pod and stem blight** are misshapen or oblong and may have a white mold growth (Figure 2). The seeds become infected when their fungal spores penetrate the pod. Infected plants are generally identifiable by the black specks that appear in rows on the stems and scattered over the pods or zone lines within cortical tissues (Figure 3). Warm, wet weather over prolonged periods during flowering and pod fill favor the disease.

Frogeye leaf spot is primarily a leaf disease (Figure 4) caused by the fungus *Cercospora sojina*. However, it can also infect stems, pods and seeds. Circular to elongated sunken and reddish-brown fungal lesions on pods can penetrate into the seeds and cause light gray to dark gray or brown specks or large blotches of discoloration on the seeds.[3]

Figure 1. Purple seed stain.

Photo courtesy of Adam Sisson, Iowa State University, Bugwood.org.

Figure 2. White coating on seed from pod and stem blight

Figure 3. Linear lesions produced by pod and stem blight.

Picture courtesy of Daren Mueller. Iowa State University, Bugwood.org.

Figure 4. Frogeye leaf spot.

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Anthracnose-infected seeds may be smaller, moldy, dark brown, and shriveled. Anthracnose is favored by warm, wet weather. Anthracnose can also cause damage to leaves, stems, pods and petioles (Figure 5 and 6). Damage to seed has been noted in samples from fields that did not have fungicides applied at R3.[4]

Bean pod mottle virus (BPMV) (Figure 7) and **soybean mosaic virus** (SMV) (Figure 8), are widespread viral diseases transmitted through leaf-feeding by bean leaf beetles. These diseases can cause the hilum to "bleed" down the side of the seed. The intensity of the black or dark discoloration can be a factor of environmental conditions. The discoloration can also be characteristic of some soybean products.[5]

The mouthpart of **stink bugs** pierce pods and suck fluids from developing seeds (Figure 9). Injured seeds are shriveled, smaller, discolored, and low in oil content, which can lower quality and yield. Feeding can also delay plant maturity, leading to "stay-green syndrome".[6]

Sources

(Sources verified 8/26/2020)

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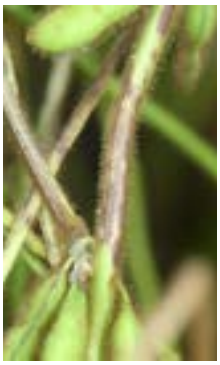

Figure 5. Anthracnose in soybean prior to harvest.

Photo courtesy of Daren Mueller

Figure 6. Anthracnose in soybean at harvest.

Photo courtesy of Daren Mueller, Iowa State University, Bugwood.org.

Figure 7. Bean pod mottle virus.

Picture courtesy of Edward Sikora, Auburn University, Bugwood.org.

Figure 8. Soybean mosaic virus.

Figure 9. Green stink bug nymph (left), adult (middle), and pod damage (right) to soybean.