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## Seed quality-related soybean diseases

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# Seed quality-related soybean diseases

## **Abstract**

This growing season, Iowa soybean producers have seen several diseases, a few of which affect seed quality. These diseases include fungal diseases and viral diseases. At harvest, it is likely that soybean from some fields will show discoloration, which can be a concern when beans are used for seeds. For some diseases, infected seeds may be discolored but not important to the spread of pathogens. This article discusses seed quality-related diseases at harvest.

## **Keywords**

Plant Pathology

## **Disciplines**

Agricultural Science | Agriculture | Plant Pathology

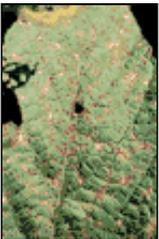
# INTEGRATED CROP MANAGEMENT

## Seed quality-related soybean diseases

This growing season, Iowa soybean producers have seen several diseases, a few of which affect seed quality. These diseases include fungal diseases and viral diseases. At harvest, it is likely that soybean from some fields will show discoloration, which can be a concern when beans are used for seeds. For some diseases, infected seeds may be discolored but not important to the spread of pathogens. This article discusses seed quality-related diseases at harvest.

### Fungal diseases

Frogeye leaf spot and Cercospora leaf spot are two diseases with reported prevalence in north central and eastern Iowa. Frogeye leafspot is caused by *Cercospora sojina*. The disease causes small, gray spots with reddish brown borders to form on the upper leaves in mid- to late August. In severe cases, the disease can cause premature leaf drop and forms brown spots on stems and pods. The fungus infects seed, and consequently, the seed coat of infected seeds turns gray.



Frogeye leaf spot caused by *Cercospora sojina*..

[Enlarge](#) [1]

Iowa has had an increased prevalence of frogeye leaf spot in recent years and it is very common in soybean fields in late summer. Because this disease can be seedborne, it is important to not save seed from fields with severe infestation. Severe infestation can be judged by severe seed discoloration at harvest, or by heavy defoliation from this disease in mid- to late August. For most fields where the disease was found, infection was light. Seed quality should not be affected in fields with light infection.

Cercospora leaf spot is caused by *Cercospora kukuchii*. The disease is easy to identify by a mottled purple-to-orange discoloration of the uppermost leaves. The leaves also have a leathery appearance. In September, when soybean plants are approaching maturity, infected leaves turn orange or bronze. The causal fungus for this disease is a very close relative of the one causing frogeye leaf spot and is also seedborne. The infected seeds have a purple

discoloration, resulting in a disease called purple seed stain that can be easily identified.



**Purple seed stain (caused by *Cercospora kikuchii*).**

[Enlarge](#) [2]

Seed infection by both diseases may cause poor seed vigor and reduced germination. Beans with substantial amounts of discoloration should not be saved for seed because of the seedborne nature of these diseases. However, there is no quantitative measurement on how much discoloration is a threshold. Keep in mind that the two fungi also survive on infested soybean residues, which become a source of inoculum in the next soybean crop.

## **Viral diseases**

Diseases caused by viruses also reduce seed quality. Viral diseases were prevalent in some regions, especially in western Iowa, which received less precipitation in the growing season than central and eastern Iowa. Insects are the vectors of soybean viral diseases. Bean pod mottle virus (BPMV) is spread by bean leaf beetles and has been a major concern in recent years. Besides BPMV, soybean mosaic virus (SMV, aphid vectors) and tobacco ring spot virus (TRSV, thrips vectors) also are present in Iowa. All diseases are seedborne, and symptoms of seeds infected by these viruses look similar.



**Seed infected by soybean mosaic virus (left) and by bean pod mottle virus (right)..**

[Enlarge](#) [3]

Importance of spreading a virus by infected seeds varies with viral diseases, pending the efficiency of seed transmission. Seed infected by SMV can effectively spread the virus into a field. However, for BPMV spread of the disease in production fields through infected seeds is less important compared with that by bean leaf beetles. Reduction of seed quality in terms of discoloration is a major concern for seed bean growers.

When considerable discoloration is found in your soybean fields, you can make a good assessment on the cause of discoloration if you scouted your crop in the summer. Severe *Cercospora* leaf spot should be followed by purple seed stain. Presence of heavy beetle damage indicates that discoloration is likely caused by BPMV, especially when a lot of wounds on pods are observed. If you do not have field records and want to determine the cause of discoloration, send discolored seed to the Seed Science Center at Iowa State University for testing. Please call (515) 294-6821 for details on how to prepare and send samples.

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**Links:**

[1] <http://www.ent.iastate.edu/imagegal/plantpath/soybean/frogeyels/frogeye.html>

[2] <http://www.ent.iastate.edu/imagegal/plantpath/soybean/cercospora/3115.17purpless.html>

[3] <http://www.ent.iastate.edu/imagegal/plantpath/soybean/smv/smvvsbpmvxb.html>

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