2015

# Dry Bean Pest Scouting Report

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NORTHWEST CROPS & SOILS PROGRAM

# 2015 Dry Bean Pest Scouting Report

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A survey of dry bean pests was conducted on farms in Vermont during the 2015 season.

Pests were scouted on four Vermont farm locations in the towns of Alburgh, North Hero, Glover, and Danby. Disease and insect samples were taken and identified with assistance from the UVM Plant Diagnostic Laboratory. The primary and secondary fungal and bacterial diseases documented on dry beans in Vermont are listed in Table 1.

Table 1. Pests identified on dry beans in 2015. Species and strains were not identified.

| **Fungal Disease** |
|---|
| Alternaria |
| Anthracnose |
| Ascochyta caused by *Phoma exigua* |
| Fusarium |
| Phoma/Phomopsis |
| Rhizoctonia |
| Rust |
| Sclerotinia |
| White leaf spot |
| **Bacterial Disease** |
| Bacterial brown spot |
| Common bacterial bean blight |
| **Insects** |
| Potato leafhopper |

Pests by Location. In Alburgh and North Hero, weeds were an unmanageable pest. Observationally, black turtle beans outcompeted weeds better than pinto and yellow eye varieties. This may be due to higher plant populations and better plant canopy closure. Weed pressure was less of an issue in the Glover and Danby locations where mechanical cultivation occurred frequently.

High moisture conditions during the month of June likely created a habitable environment for a variety of leaf and root diseases. In Alburgh and Glover, early season root rot diseases rhizoctonia and fusarium were identified (Figure 1). Pythium is another root rot disease likely present on bean roots at emergence. Where one of these diseases is observed, it is likely that the others are also present. One will give the others an opportunity to attack, together restricting nutrient and water uptake. Mosaic patterns of yellow discoloration were observed in large production bean fields. This was not positively identified as a virus but instead thought to be poor delivery of nutrients to the plant as a result of a compromised root system.

Figure 1. Root lesions from rhizoctonia and fusarium causing lack of nutrient flow to leaves.

Dry beans in Danby experienced more pest pressure from potato leafhopper, a native insect pest in comparison to other locations. Common bacterial bean blight can look very similar to leafhopper damage (Figure 2). We sampled several plants that we thought were common bacterial bean blight and found little evidence of bacteria.

Interestingly, anthracnose was observed in all locations except for Danby. Alternaria and rust were present on 95% of bean pods from Danby. Please see the "Dry Bean Disease Cheat Sheet" on our website for more pictures to identify dry bean pests.

Anthracnose. This easy-to-identify fungal disease appeared to be an important systemic disease in bean fields (Figure 3). We observed a discoloration that began as red spots on leaves that developed into lesions. As lesions developed, leaf veins turned reddish-dark brown. When pods developed black, circular lesions were prevalent and fungal spores were confirmed as anthracnose. The following varieties appeared to be more susceptible to this disease: Tongue of Fire, Snow Cap, Red Calypso, Black Calypso, Tiger's Eye, European Soldier, Vermont Cranberry, Spanish Talosna, and Jacob's Cattle. Anthracnose survives in crop residue and seeds.

Figure 2. Potato leafhopper damage called "hopperburn" can weaken plants, making them more susceptible to pathogens.

IPM (Integrated Pest Management) Tactics. In our cool, moist climate, practices that are critical to managing the multitude of diseases that impact dry beans include: planting clean seed, rotating crops, and improving air flow. We highly recommend buying "certified" seed when possible. Certified seed guarantees that the seed meets or exceeds a strict set of quality control standards. In the case of beans, this includes rigid standards on seed diseases. Several diseases like bacterial blight and anthracnose can be transmitted by seed. Weed management is especially important to improve air flow and assist with keeping the bean plant canopy as dry as possible. A dry canopy can help minimize the infection of disease. Spores from many of the fungal diseases can survive in the soil for 3 to 5 years waiting for their host plant and/or ideal conditions. Therefore, crop rotation and healthy soil is critical to minimizing diseases present during bean production.

Overall, bean pods scouted for disease during the 2015 growing season showed abundant deformities and discoloration from diseases, however for the most part the beans inside appeared largely uninfected. Growers reported "average" yields in 2015 suggesting that although colored beans appear unblemished from disease, yield may have been impacted. At this time, to what extent bean diseases present on all plant parts impact bean yield and quality.

Figure 3. Reddish, dark brown anthracnose in leaf veins and lesions on pods. Note the leaf curling from potato leafhopper in the middle picture.

Potato Leafhopper. The abundant leafhopper population during the 2015 growing season caused severe injury to certain dry bean varieties. Adult females overwinter in southern states and are carried northward on spring wind currents. The migratory nature of this native pest make its arrival time and population size unpredictable. Potato leafhoppers feed with piercing-sucking mouthparts on host plant vascular tissue. This restricts phloem and eventual xylem flow to the rest of the leaf, resulting in leaf edge yellowing and curling. Visual damage caused by potato leafhopper is called "hopperburn" (Figure 3). Potato leafhopper populations were severe in 2015. Because dry beans are planted in late spring, they can "escape" the first generation of leafhoppers. As the season progresses, future generations of leafhopper may jump over to feed on other broadleaf crops such as dry beans, alfalfa, hops, raspberries, and grapes.

IPM Tactics. IPM programs in other crops include weekly monitoring of the population. In dry beans, scouting the underside of three leaves/plant in each variety is recommended weekly. Potato leafhoppers have feeding preference for different varieties. Preliminarily, tiger's eye appears to be a more susceptible dry bean variety. Feeding preference is not known for all heirloom varieties; farm observation will become necessary to select bean types that may be less susceptible. In most years, beneficial arthropods can greatly diminish leafhopper populations. However, in years with severe outbreaks, other control options may be required. Insecticide application is an option, especially in years of severe infestation; however, options are limited for organic growers. OMRI approved products with azadirachtin or pyrethrin as active ingredients are effective against potato leafhopper. Products with active ingredients beta-cyfluthrin or imidicloprid are used for potato leafhopper control under conventional management. As always, pesticides used must be registered for use on beans in your state. Read and follow pesticide labels carefully. Be very aware that broad-spectrum insecticides kill natural predators and often lead to secondary outbreaks of other pests such as two-spotted spider mite.

USDA

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