Plants killed by soybean gall midge. [6]

Soybean gall midge: a new field crop pest

INTRODUCTION

Soybean gall midge was first noted in northeastern Nebraska in 2011 and eastern South Dakota in 2015. Midge infestations were isolated and spread slowly, before eventually being detected in Minnesota and northwestern Iowa in subsequent growing seasons. These fields experienced hail damage during the early half of the growing season and entomologists thought the adult midges were attracted to damaged plants. Similar reports of midge infestations were associated with plant diseases, such as stem canker, charcoal rot, pod and stem blight, cercospora leaf blight, and brown spot. Midge-infested fields were not associated with significant yield loss during this time. In 2018, soybean gall midge spread quickly and was confirmed in 65 counties in the north central region in 2018 (Figure 1), including 16 counties in western Iowa. Significant yield loss was reported in many of the midge-infested fields during the 2018 growing season.

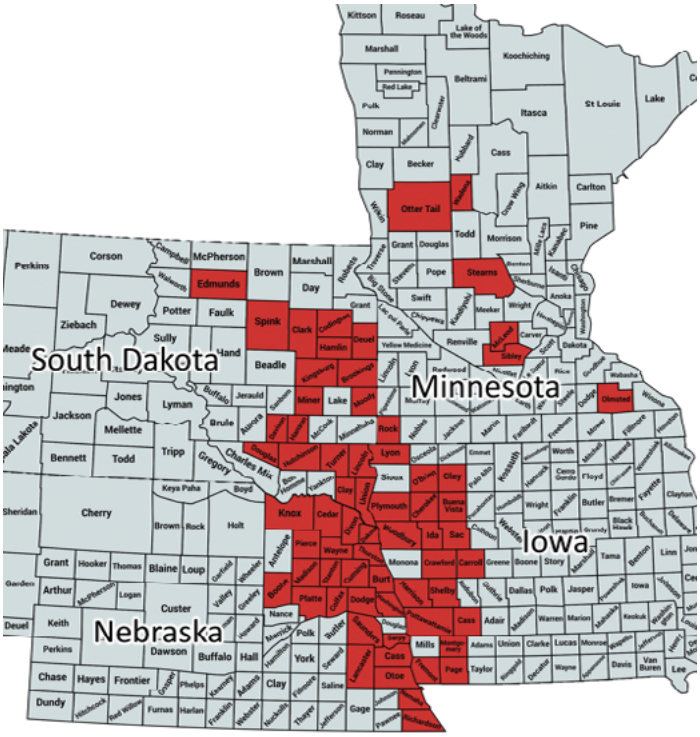

Figure 1. Counties in red indicate the presence of soybean gall midge in 2018. [1]

Figure 2. Soybean gall midge larvae; note young larvae and older larvae are present. [2]

PEST DESCRIPTION

Soybean gall midge is a new species in the genus *Resseliella* (55 species worldwide with 15 of those in North America), and have named it *Resseliella maxima*. Midges are flies (Diptera: Cecidomyiidae) with complete metamorphosis (e.g., egg, larva, pupa, and adult). More specifically, gall midges are slender, long-legged flies with hairy wings and long antennae. Larvae are easily observed inside soybean stems. Young larvae are small and translucent, and mature larvae are larger and orange (Figure 2). Adult soybean gall midges are fragile, known to be weak fliers, and were difficult to find in 2018 (Figure 3).

Figure 3. Adult soybean gall midges are 1/4 inches long; note black and white banded legs. [1]

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SCOUTING AND PLANT INJURY

A portion of the fields surveyed in 2018 had significant midge damage. There was a high frequency of dead plants at the field edge that dissipated toward the interior (Figure 4). Field surveys in Iowa, Nebraska, and South Dakota found heavily damaged soybean fields were often next to a field planted to soybean the previous year. Such observations suggest gall midge can successfully overwinter in the north central region and may be diapausing in last year's soybean.

Figure 4. Plant injury from soybean gall midge is often concentrated around the perimeter. [3]

Midge-infested soybean have discolored, swollen stems (Figure 5) near the base of the plant (i.e., 6-8 inches above the soil surface). Larval feeding causes damage to the phloem and xylem, and is likely to result in yield reductions. Additional losses are also anticipated due to the lack of stem strength, predisposing plants to increased risk of lodging if crop harvest is delayed. Eventually, infested plants become brittle and break off, resulting in plant death (Figure 6). In some cases, plants can be infested with midges and fungal pathogens, which can further impact yield losses.

Figure 5. Infested plants have corky, swollen stems just above the soil line. [2]

Figure 6. Heavily infested plants often break off at the base and die. [4]

Figure 7. Infested stems are swollen and discolored by larval feeding. [5]

PEST BIOLOGY AND MANAGEMENT

Soybean gall midge larvae appear aggregated, as many are often found feeding within a plant at the same time (Figures 2, 7). The range of larval sizes within a single plant also indicates a female egg-laying period extended over time. Larvae were observed feeding in plants from June–August, and suggests there are multiple, overlapping generations possible in Iowa.

To date, there are no consistent cultural practices that favor soybean gall midge activity. Midges were found in a wide variety of soybean genetics, row spacing, date of planting, tillage, and fertility regimes. Weed control and the use of cover crops also did not seem to influence the incidence and severity of plant damage.

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