

2022 Western Minnesota Soybean Crop & Pest Survey

Cooperators: Minnesota Soybean Research & Promotion Council, NDSU IPM Survey

Purpose of Study:

The soybean crop and pest survey was designed to provide in-season data about regional pest pressure to assist farmers and consultants in making pest management decisions. The 2022 growing season was the seventh that UMN Extension undertook this MSR&PC-sponsored survey.

This project was coordinated with a similar survey undertaken by the NDSU IPM team. Bi-state survey maps were made by NDSU IPM and are available on the NDSU Pest Management website:

<https://www.ag.ndsu.edu/ndipm/ipm-survey-archives/>

Results:

Field surveys of randomly selected Minnesota soybean fields were initiated on June 20. A total of 514 fields were surveyed from June 20 through August 19 in MN and ND. A total of 109 field visits occurred in Minnesota in 2021. The Minnesota survey locations were fewer than in past years due to difficulty recruiting scouts.

Although the 2022 growing season began approximately 2-4 weeks later than normal, the final growth stages observed in NW MN were similar to those observed in 2021 (Fig 1).

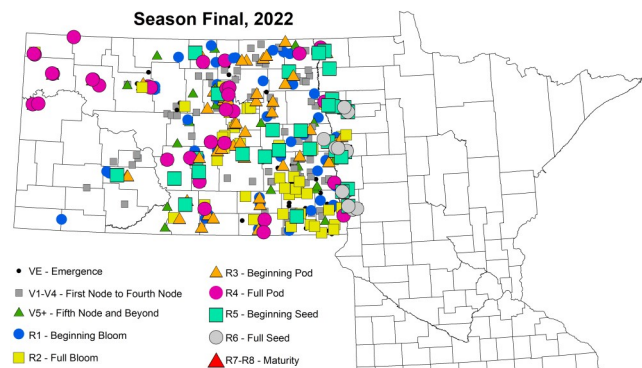


Fig 1. Growth stages, Aug 8-19, 2022 (NDSU IPM).

At each field, the scout collected data both inside and outside fields. Outside each field, grass areas that bordered fields were swept for grasshoppers (Figure 2) and their nymphs (Figure 3).

Overall, after the 2021 drought and favorable overwintering conditions, wet spring weather likely allowed for some mortality of overwintering grasshopper eggs.

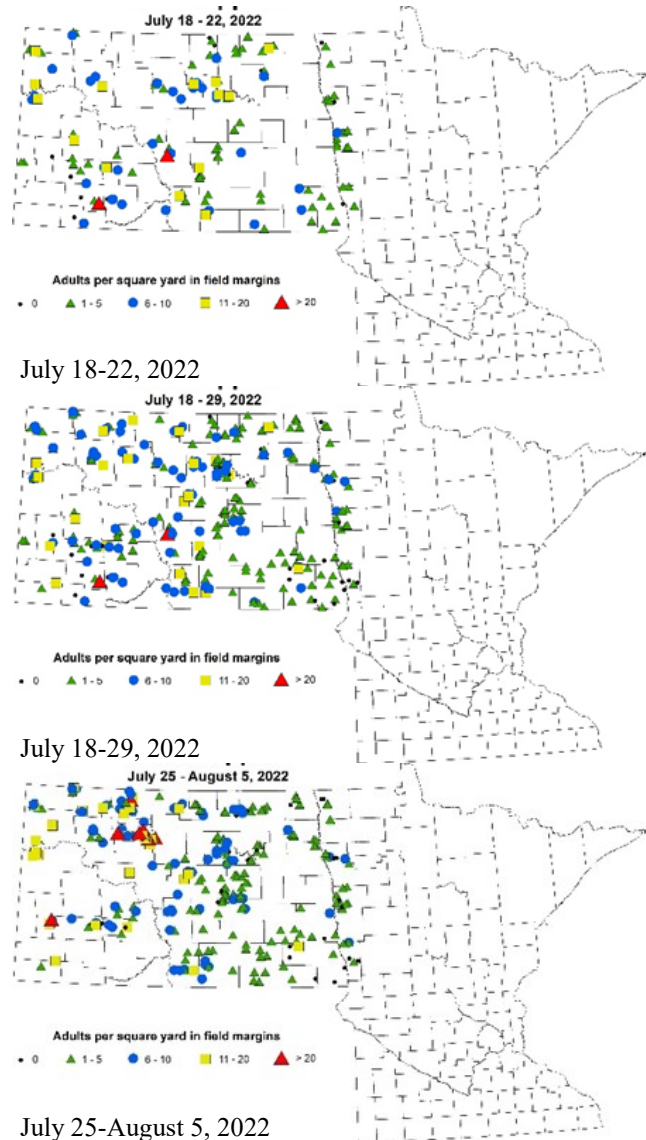


Fig 2. Grasshopper adults on the edge of scouted soybean fields, Jul 18-Aug 19, 2022; Map: NDSU IPM. Continued on next page.

Western Minnesota Soybean Crop Survey (continued)

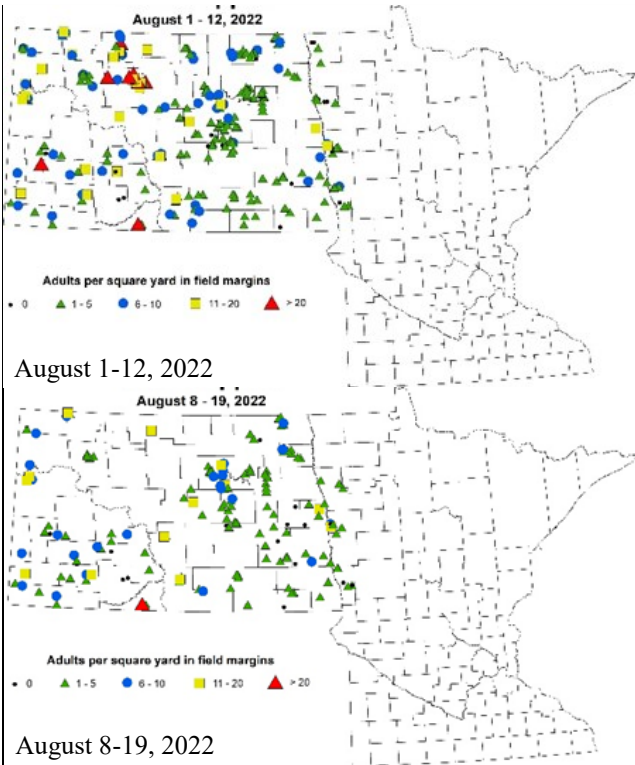


Fig 2. Grasshopper adults on the edge of scouted soybean fields, Jul 18-Aug 19, 2022; Map: NDSU IPM. Continued from previous page.

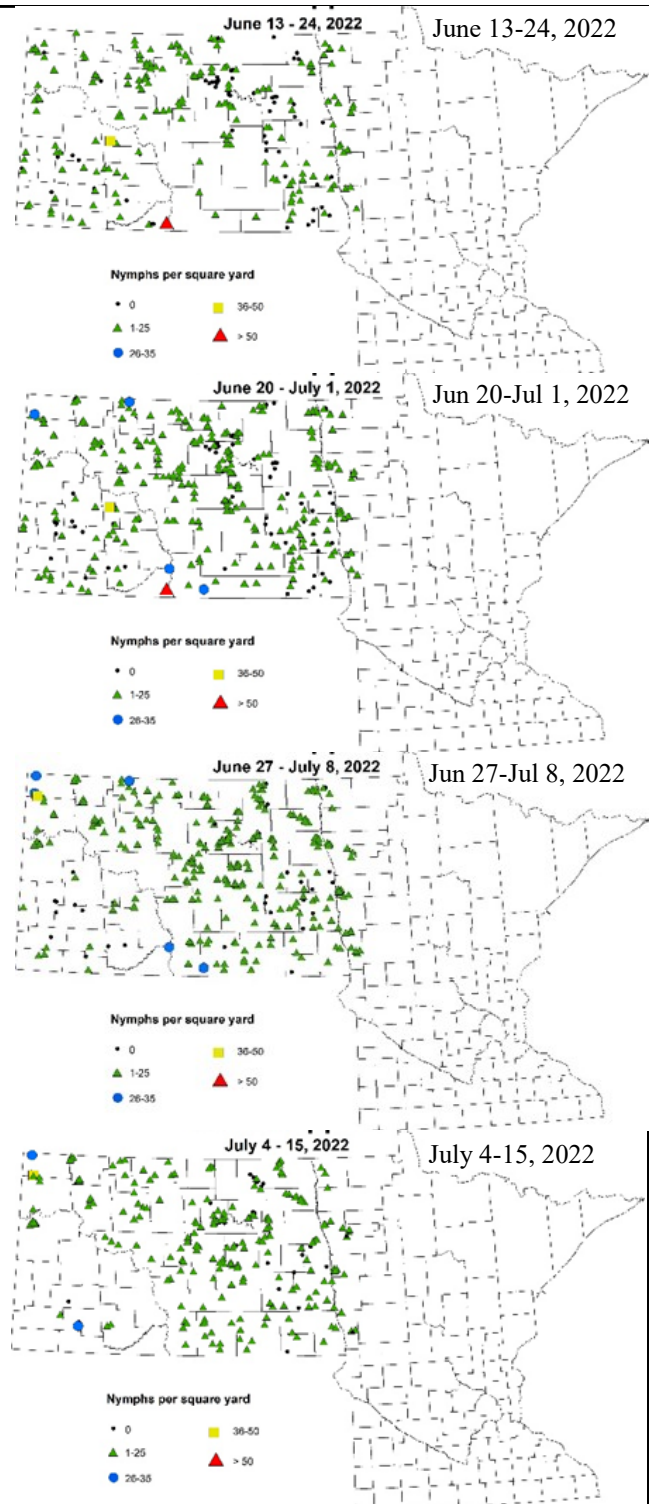


Figure 3. Grasshopper nymphs caught on edge of scouted fields from June 6-July 15, 2022 (Map: NDSU IPM). Continued from previous column and onto next page.

Fig 3. Continued in next column.

For Additional Information:
 Angie Peltier or Anthony Hanson

Funding Provided by:
 Minnesota Soybean Research & Promotion Council

Western Minnesota Soybean Crop Survey (continued)

Although soybean aphid incidence (the percentage of plants within a field that were infested) continued to grow throughout the growing season (Fig 4), the population density, or average number of soybean aphids per plant, of these infestations remained well below the soybean aphid treatment threshold of 250 aphids per plant, averaging less than fewer than 200 aphids per plant at all but two locations (Fig 5).

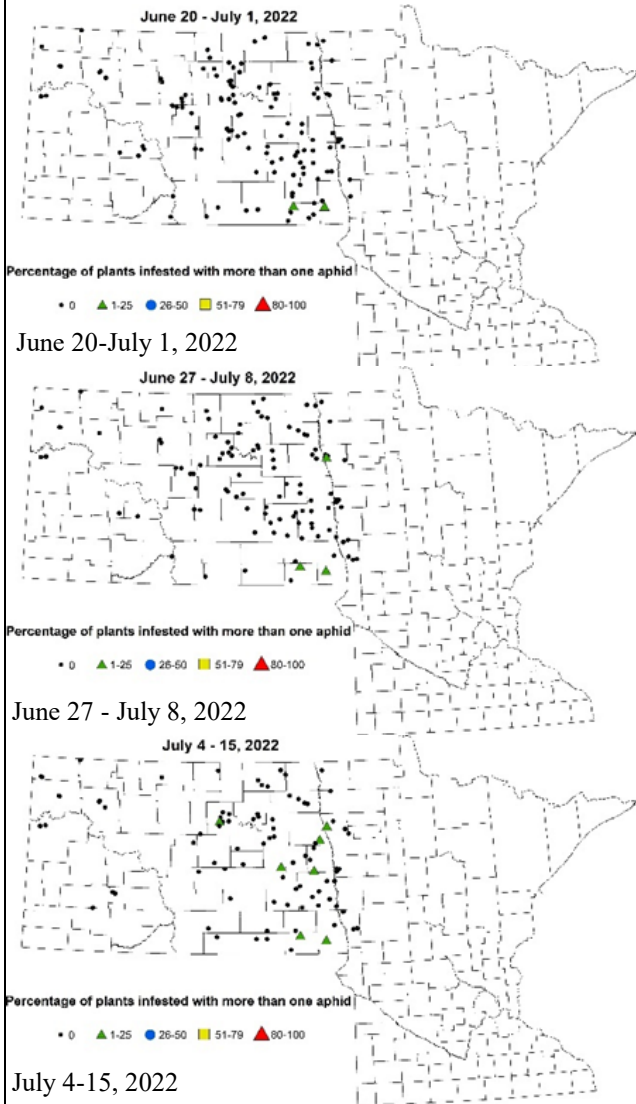


Figure 4. Percentage of surveyed soybean plants with at least one soybean aphid; Map: NDSU IPM. Continued in next column.

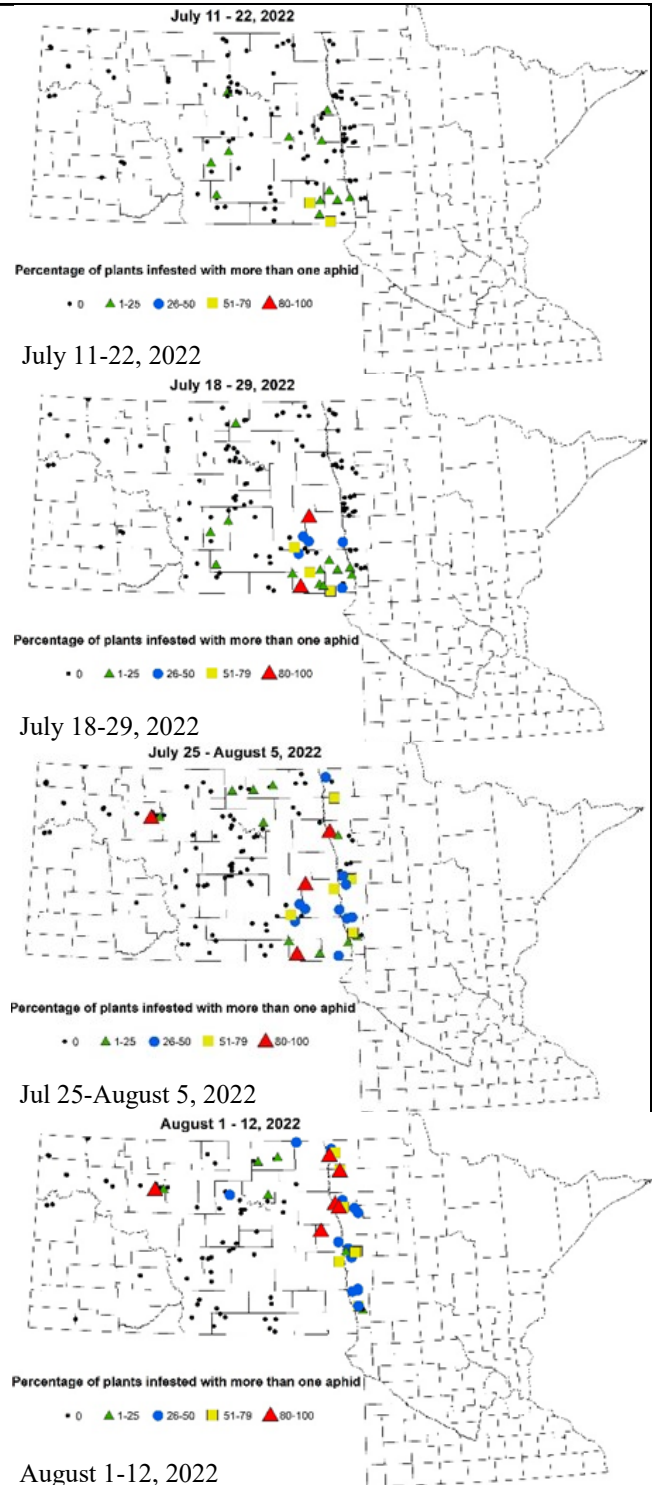
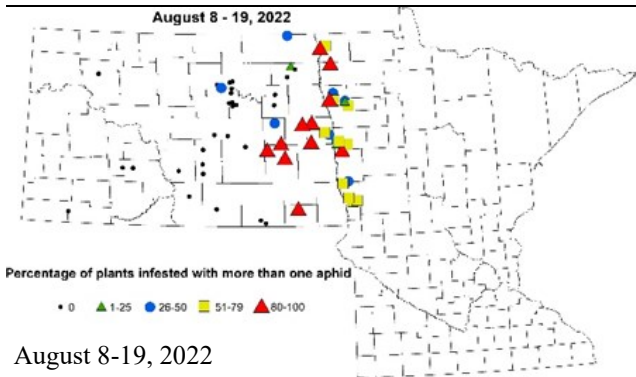


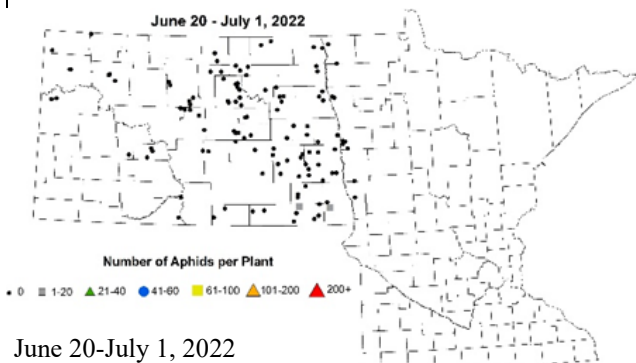
Figure 4. Percentage of surveyed soybean plants with at least one soybean aphid; Map: NDSU IPM. Continued from previous column and onto the next page.

Western Minnesota Soybean Crop Survey (continued)

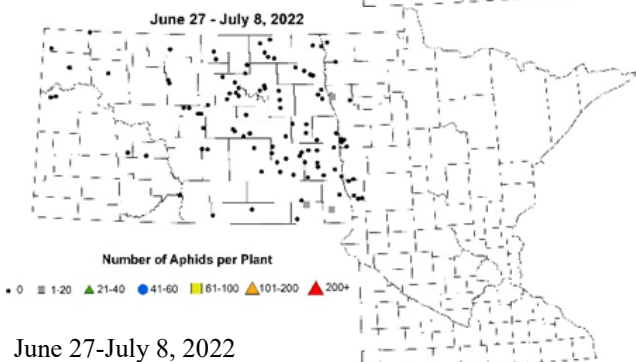


August 8-19, 2022

Figure 4. Percentage of surveyed soybean plants with at least one soybean aphid; Map: NDSU IPM. Continued from previous page.

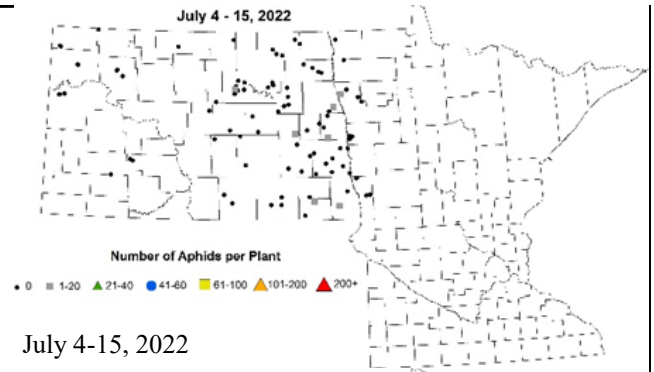


June 20-July 1, 2022

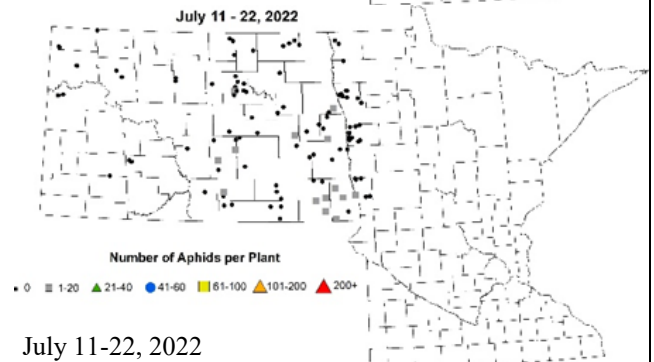


June 27-July 8, 2022

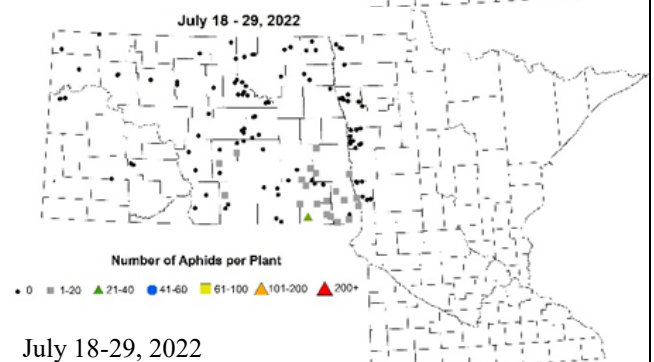
Figure 5. Soybean aphid severity (# of aphids per plant) over 2-week periods from June 20 to August 19, 2022; Map: NDSU IPM. Continued on next column.



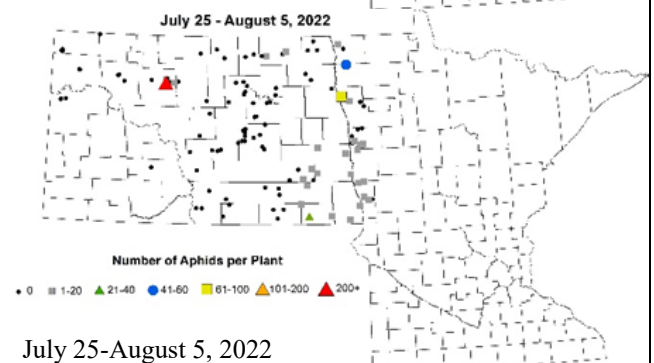
July 4-15, 2022



July 11-22, 2022



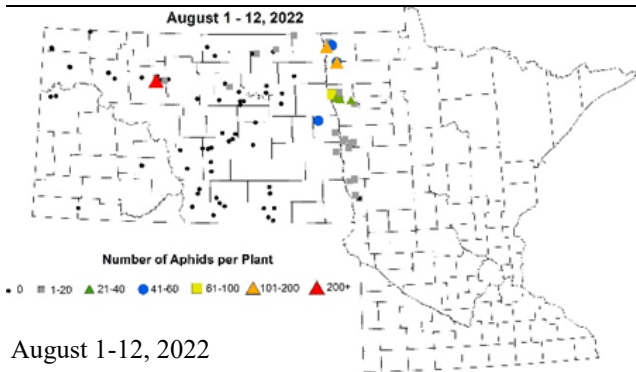
July 18-29, 2022



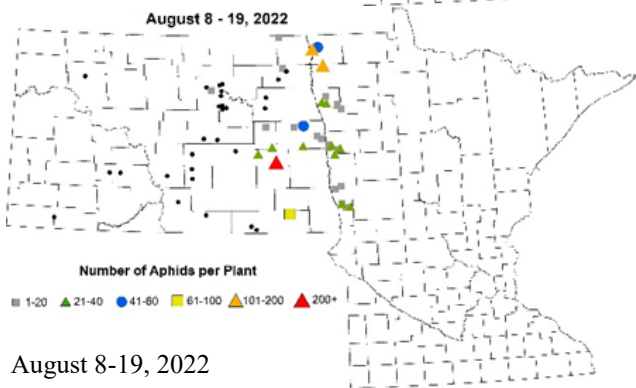
July 25-August 5, 2022

Figure 5. Soybean aphid severity (# of aphids per plant) over 2-week periods from June 20 to August 19, 2022; Map: NDSU IPM. Continued from previous column and onto next page.

Western Minnesota Soybean Crop Survey (continued)



August 1-12, 2022

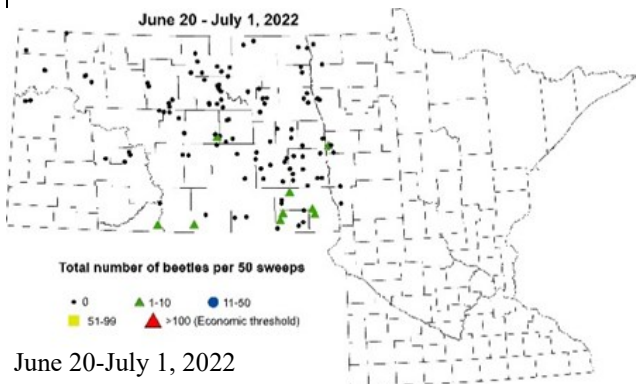


August 8-19, 2022

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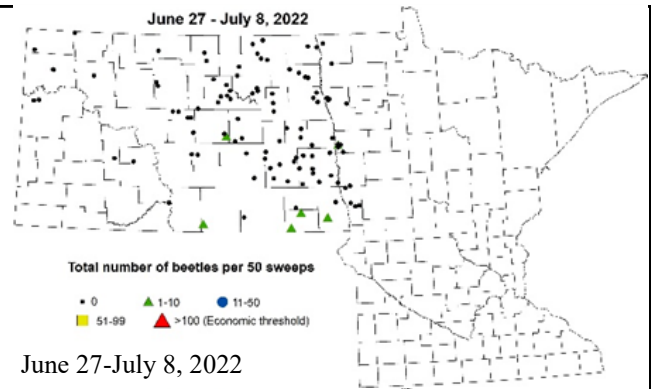
Aphid “mummies”, or dead soybean aphids colonized by a parasitic wasp that is a natural enemy of the aphid were also scouted for, with only one scouted location with 5% of the plants colonized by wasps.

Few bean leaf beetles were captured with sweep nets (**Figure 6**) and average defoliation that they caused was 10% or less (**Figure 7**).

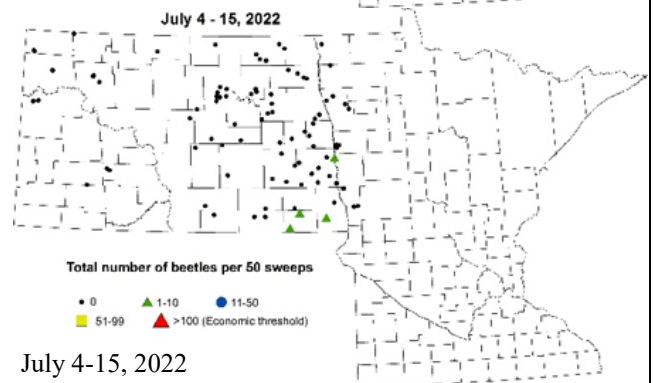


June 20-July 1, 2022

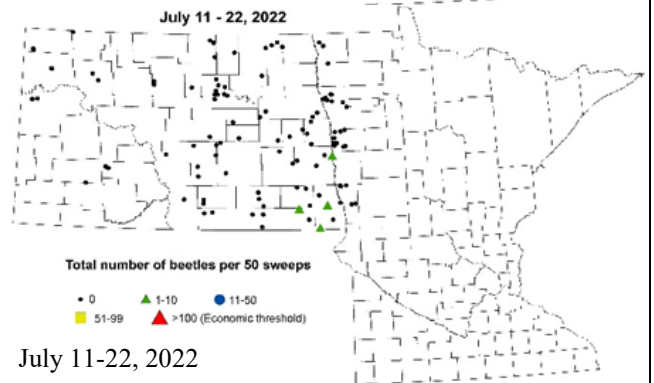
Figure 6. Number of bean leaf beetles per 50 sweeps over two-week periods from June 20 to August 19, 2022; Map: NDSU IPM. Continued.



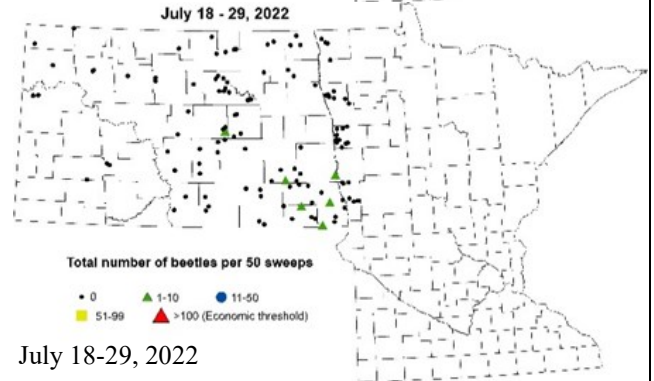
June 27-July 8, 2022



July 4-15, 2022



July 11-22, 2022



July 18-29, 2022

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Western Minnesota Soybean Crop Survey (continued)

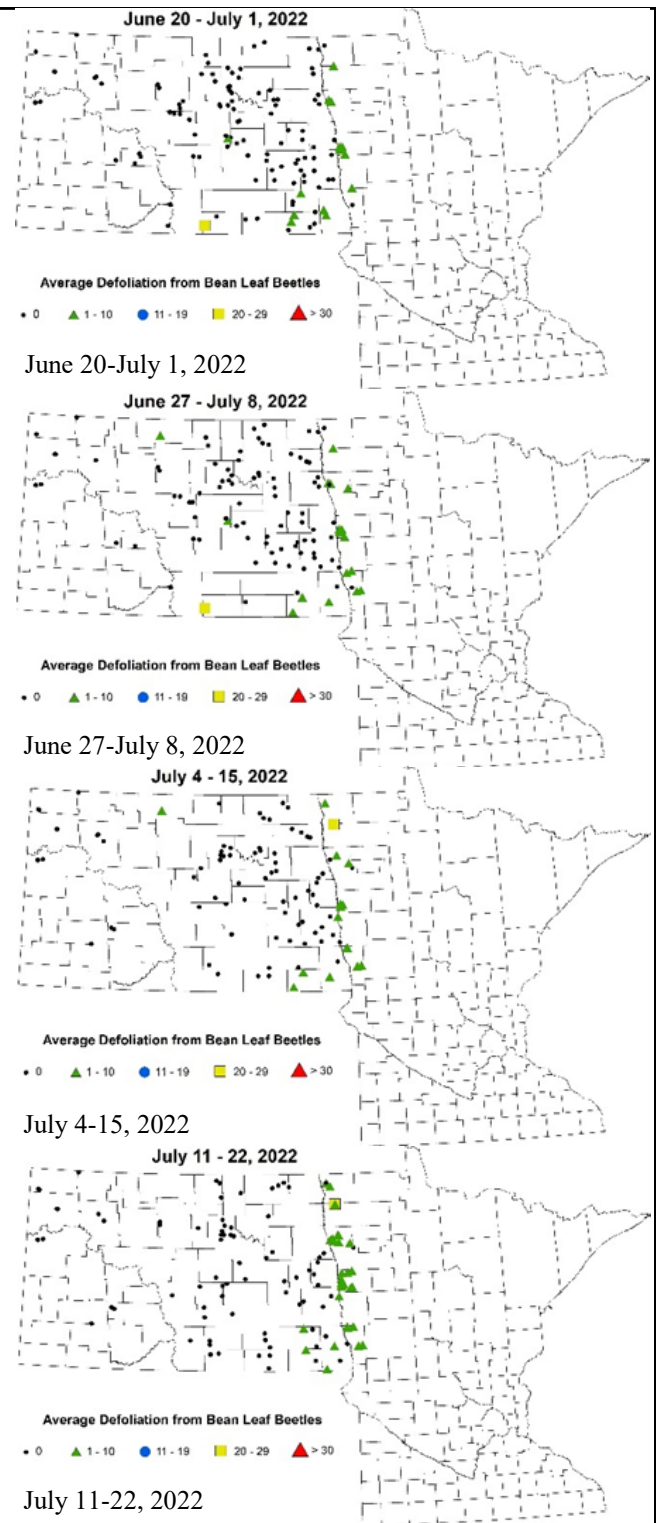
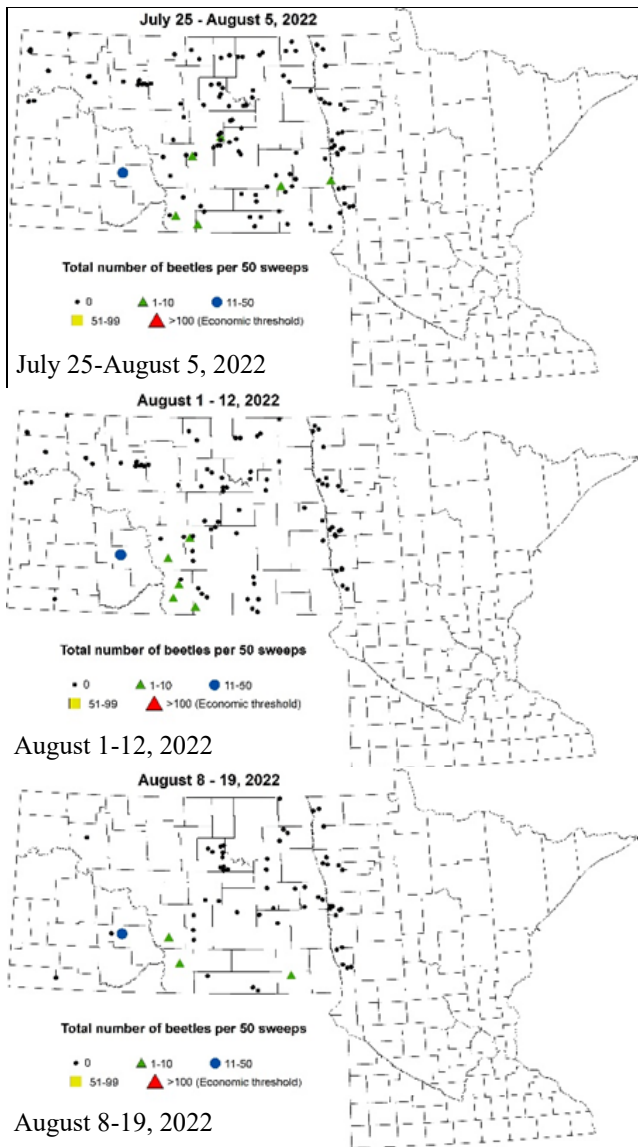
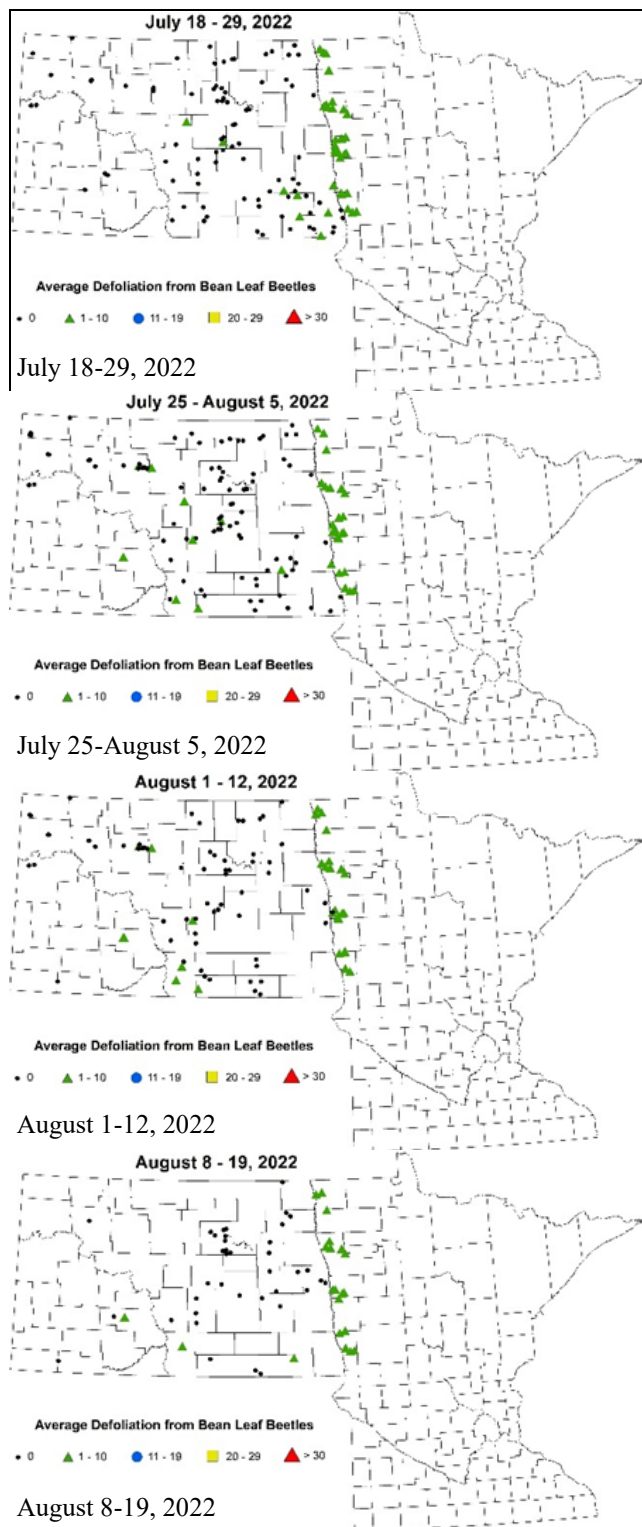


Figure 6. Number of bean leaf beetles per 50 sweeps over two-week periods from June 20 to August 19, 2022; Map: NDSU IPM. Continued from page.

Figure 7. Average bean leaf beetle defoliation injury, June 20-August 19, 2022; Map: NDSU IPM. Continued on next page.

Western Minnesota Soybean Crop Survey (continued)



Unlike in 2021, when severe to exceptional drought conditions favoring spider mite infestations on plants growing along field borders and soybean plants within fields, spider mites were neither observed outside or within scouted fields in 2022.

While scouting for soybean gall midge larvae also took place in all surveyed fields for the first time in 2022, none were observed.

Preserving a.i.'s efficacy. Insecticides have been widely used in soybean production, often without consideration of treatment thresholds, as 'cheap and easy insurance' when added to the spray tank when making post-emergence herbicide or fungicide applications.

As scouted fields in NW MN did not reach treatment thresholds for commonly occurring pests like soybean aphids or two-spotted spider mites, unnecessary pesticide applications could have been avoided by most. Avoiding unnecessary applications helps to preserve a.i. efficacy. Each time that an insecticide or miticide is used, it selects those insects or mites that are resistant to that active ingredient(s) (a.i.) to survive and reproduce, killing those that are sensitive to the a.i. Over time this results in a population shift from one that is largely a.i.-sensitive to one that is largely a.i.-resistant.

Do your best to avoid unnecessary pesticide applications. Insecticide and fungicide applications can adversely affect biological control conferred by natural predators (like the parasitic wasps that colonize soybean aphids) or entomopathogenic fungi and may actually cause spider mite populations to flare up.

Figure 7. Average bean leaf beetle defoliation injury, June 20-August 19, 2022; Map NDSU IPM. Continued from previous page.