2025 Hessian Fly Pheromone Trapping Report

Anitha Chirumamilla[1], Patrick Beauzay[2] and Janet Knodel[2]

[1] *Langdon Research Extension Center, Langdon, ND*
[2] *North Dakota State University, Fargo, ND*

Contributors:

Megan Vig- Extension Agent, Steele County
Scott Knoke- Extension Agent, Benson County
Jeff Stachler- Extension Cropping Systems Specialist, Carrington Research Extension Center
Victor Gomes- Extension Cropping Systems Specialist, Dickinson Research Extension Center

Introduction:

Hessian fly, *Mayetiola destructor* (Say), is one of the most significant insect pests affecting wheat in North Dakota. This insect pest was introduced into North America during the late 1770s in Long Island, New York by straw-bedding of Hessian soldiers during the American Revolution. Its populations have spread across the wheat-growing regions of the country. While wheat is the main preferable host, it also infests barley, rye and several species of grass as alternative hosts. Historically, Hessian fly has been a sporadic pest in ND, with notable outbreaks occurring in 1991, 2003 and 2015 (Knodel, 2015). A study conducted by Anderson et al. (2012) used pheromone traps to monitor the distribution and spread of this insect in the state, but the study is now over a decade old. In recent years, renewed Hessian fly activity, especially in northeast ND has renewed concern among growers. To improve our understanding of Hessian fly population dynamics, including spatial distribution and peak adult emergence, a statewide trapping program using sex pheromone–baited sticky traps was initiated in 2023 (Fig. 1). **This year marks the third year of the project.**

Materials and Methods:

Sex pheromone lures were obtained from Pherobank, Netherlands. These lures were deployed in delta sticky traps positioned on poles at the edges of the wheat fields (Fig. 2). Trap liners were changed weekly and stored in Ziploc bags in the freezer until the number of flies could be counted (Fig. 3). The lures were replaced every four weeks. Traps were established at the beginning of the season, immediately following wheat emergence, and remained in place until harvest. Monitoring dates varied by trapping sites. A total of 28 traps were placed in 25 counties.

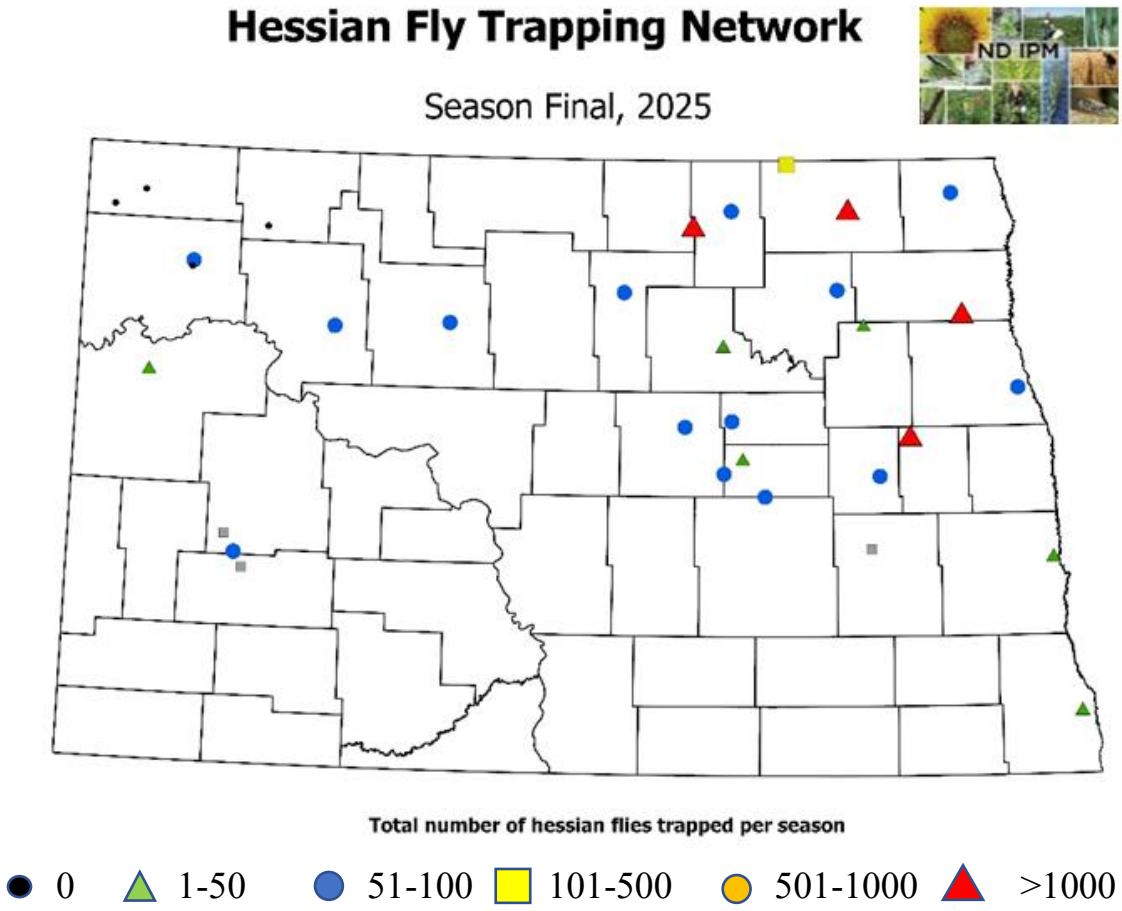

Figure 1: Season count of 2025 Hessian fly trapping network.

Results:

Distribution

Third-year trapping results indicate a substantial and growing presence of Hessian fly across the state. In 2025, a total of **16,357** Hessian flies were captured on sticky traps monitored by IPM insect trappers from early June through early September (Fig. 1 and Table 1). This total represents a **31% increase** over 2024, when **12,530** flies were captured at 26 traps placed across 21 counties. For comparison, in 2023 only **1,527** Hessian flies were recorded at 37 trapping sites, underscoring the rapid rise in population levels over the past three years.

In 2025, trap catches of Hessian flies were highest in the northeast region of North Dakota, with more than 1,000 Hessian flies per trap recorded at sites in Walsh, Rolette, Cavalier, and Steele counties. These four sites accounted for approximately 14% of the 28 trap locations statewide. This pattern closely resembled the distribution observed in 2024.

Figure 2: Hessian fly pheromone trap set in a wheat field by IPM trapper. Photo: Anitha Chirumamilla

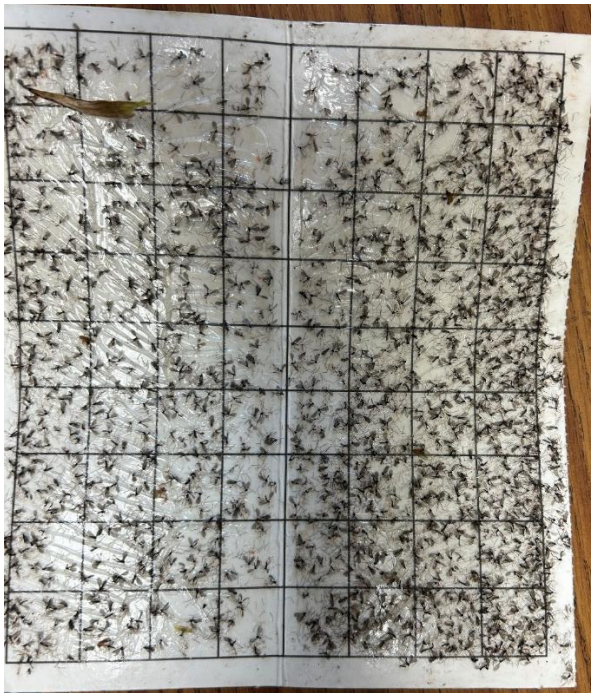

Figure 3: Pheromone trap sticky bottom with Hessian flies. Photo: Anitha Chirumamilla

However, notable shift in Hessian fly population dynamics were observed across Walsh, Pembina, and Cavalier counties. In Pembina County, total trap counts dropped sharply from 2,805 in 2024 to just 291 in 2025. In contrast, Walsh County experienced a substantial increase, with counts rising from 300 to 1,261 flies over the same period. Cavalier County also showed significant growth: the Cavalier County LREC site increased from 169 flies in 2024 to 2,900 in 2025, while the second Cavalier County trap site rose from 164 to 904 flies. Across the remaining 23 trap sites, counts remained lower, with fewer than 500 flies recorded (Table 1).

Table 1. Summary of Hessian fly trapping in North Dakota, 2024 and 2025

	County	Total No. of Hessian fly 2024	Total No. of Hessian fly 2025
1	Stark	3	4
2	Dunn 2	0	14
3	Barnes	-	14
4	McKenzie	-	53
5	Richland	231	59
6	Foster CREC	310	74
7	Benson	112	76
8	Nelson	764	76
9	Cass	252	79
10	Griggs	100	116
11	Ward	183	117
12	Dunn 1	156	126
13	Pierce	-	130
14	Foster	-	141
15	Williams	0	149
16	Wells	-	226
17	Mountrail	63	243
18	Towner	278	260
19	Grand Forks	155	262
20	Pembina	2805	291
21	Eddy	-	297
22	Ramsey	410	324
23	Stutsman	-	386
24	Cavalier	164	904
25	Walsh	300	1261
26	Steele	1254	1360
27	Cavalier LREC	169	2900
28	Rolette	2403	6415
	Total	**12530**	**16357**

Peak Emergence:

Hessian fly has two generations in ND. The first-generation flies emerge in early spring and the second-generation flies appear in late summer, particularly in August and September (Anderson et al., 2012). To better understand these emergence patterns, we analyzed weekly fly-count data from both eastern and western counties of ND during the trapping period (Figs. 4 and 5).

The Weekly trap count data indicate that first-generation Hessian flies emerged from their overwintering pre-pupal stage in spring, coinciding with the emergence of spring wheat. Population levels were initially low across all trapping sites. Notably, there was no clear separation between first- and second-generation adults, as fly emergence continued throughout the season. The highest trap catches in ND occurred during July and August in both eastern and western regions. Based on the interval between the initial trap captures and these peaks, the increased fly counts during midsummer likely reflect the emergence of the second generation (Figures 4 and 5).

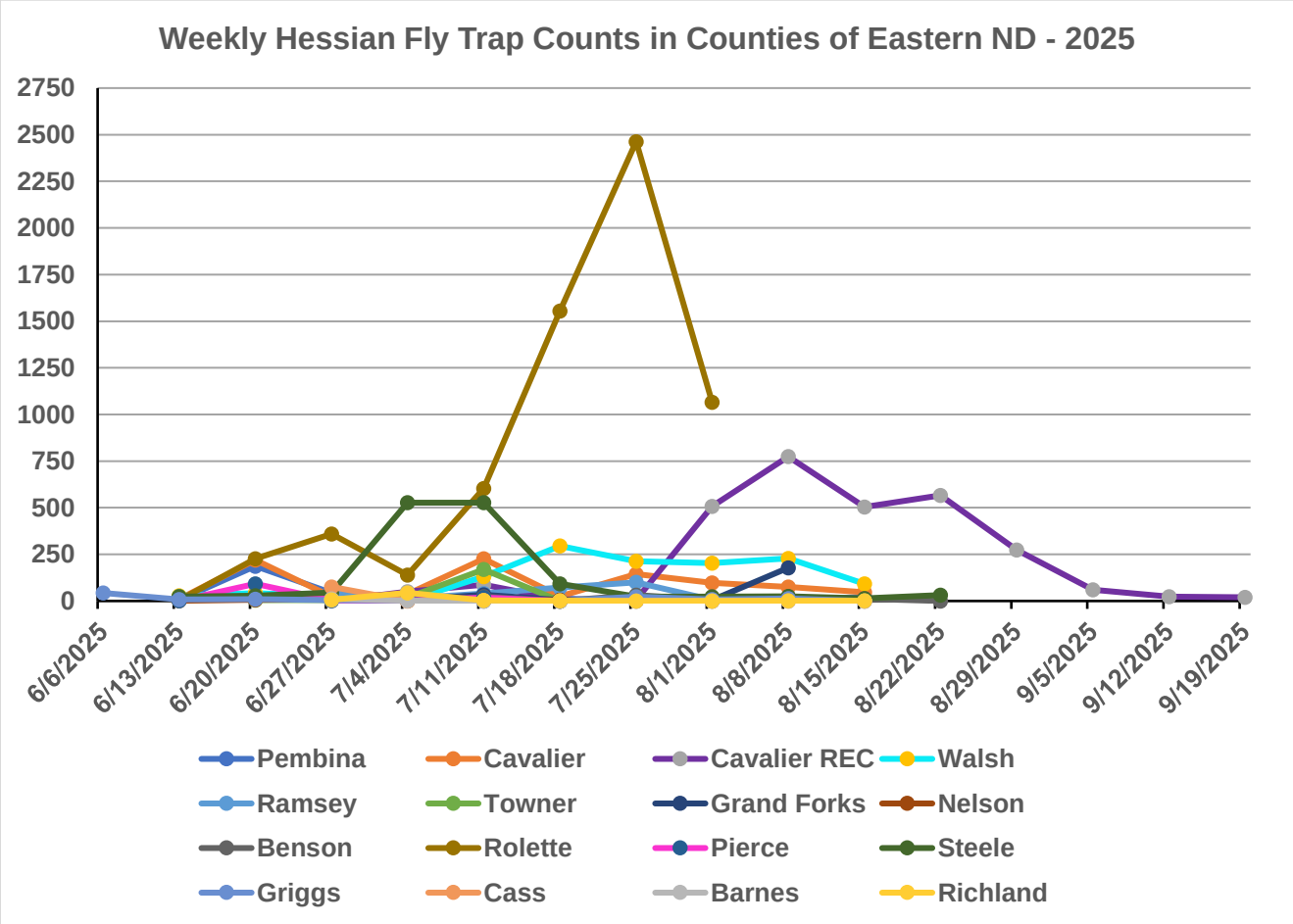

Figure 4: Weekly trap catch data of Hessian flies in eastern counties of ND.

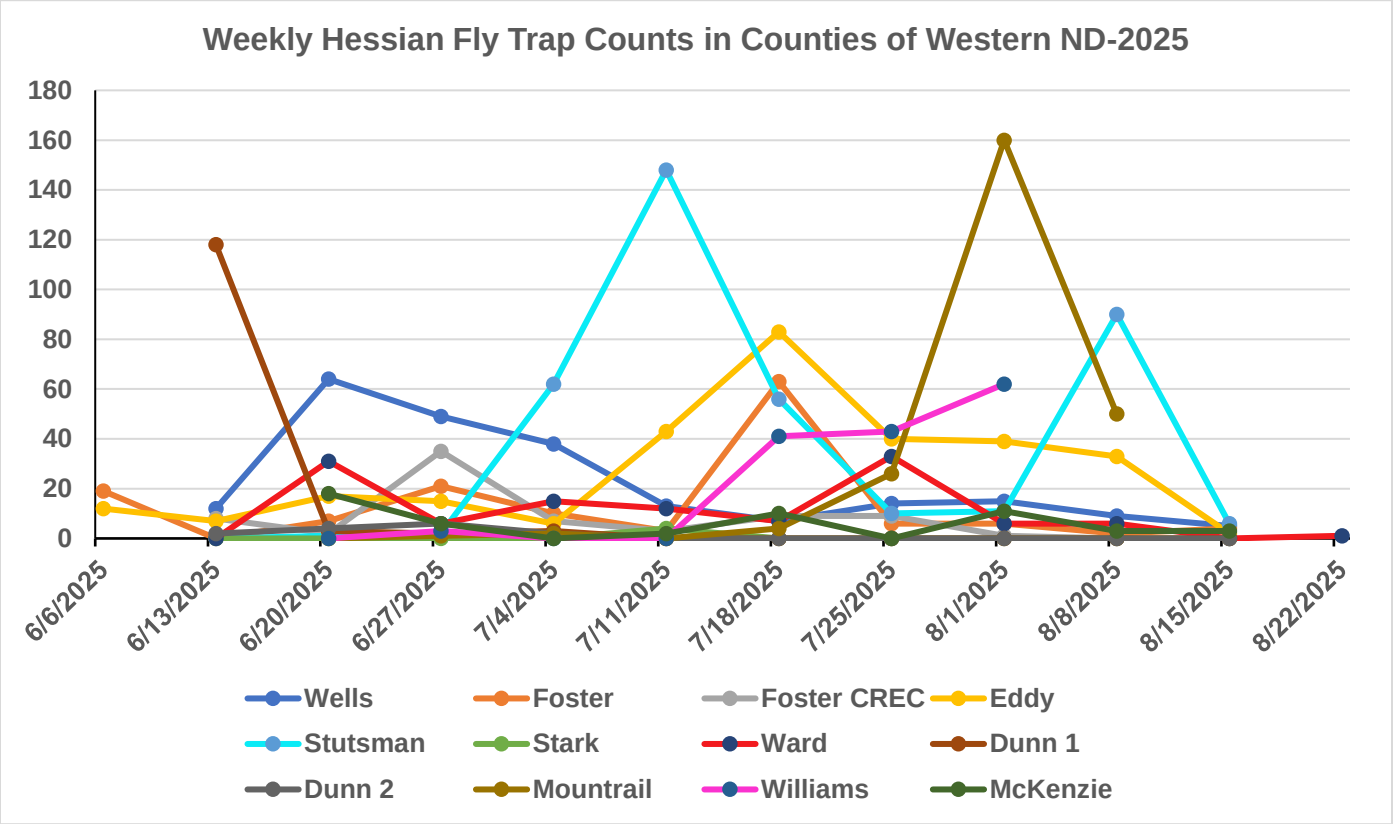

Figure 5: Weekly trap catch data of Hessian flies in western counties of ND.

Best Practices for Managing Hessian fly Infestation:

Effective Hessian fly management should focus on preventative strategies rather than chemical control. Key practices include destroying volunteer wheat and grassy hosts at least two weeks before planting, and selecting non-host cover crops to interrupt the pest's life cycle. Planting winter wheat and other small grains after the recommended "fly-free dates" (Sept. 15 in northern ND; Sept. 30 in southern ND) helps limit fall infestations, although warming autumn conditions may reduce the effectiveness of these dates.

Using resistant or tolerant varieties is the most economical control method. However, no resistant varieties are currently available, ongoing breeding programs at NDSU may provide new options in the future. Chemical control remains limited due to prolonged fly emergence, lack of monitoring tools, and short residual activity of insecticides. Seed treatments can provide early-season protection in winter wheat but offer minimal

defense against spring infestations, while foliar pyrethroid applications are only effective when precisely timed with peak fly emergence.

Historically, insecticide use in ND was not advised because Hessian fly populations remained low. Recent data from the 2025 trapping season, however, reveal dramatic increase in fly numbers, particularly in the northeastern region, with over 1,000 flies captured per trap. These elevated numbers signal a high risk of Hessian fly infestation in wheat for 2026.

Acknowledgements

Thanks to the North Dakota Wheat Commission and the USDA NIFA CPPM EIP grant award 2021-70006-35330 for support. Thanks to all the IPM trappers who helped us in 2023, 2024, and 2025.

References

Anderson, K. M., Y. Hillbur, J. Reber, B. Hanson, R. O. Ashley, and M. O. Harris. 2012. Using sex pheromone trapping to explore threats to wheat from Hessian fly (Diptera: Cecidomyiidae) in the Upper Great Plains. Journal of Economic Entomology, 105: 1988–1997.

Knodel, J. 2015. Hessian fly damaged wheat. North Dakota State University Crop and Pest, Report no. 15, August 13, 2015, Fargo, ND