Wheat midge populations have dropped significantly in North Dakota according to a soil survey conducted by North Dakota State University's department of entomology. That's good news for wheat farmers who have spent the last two years battling the tiny mosquito-like insect.

The 1996 survey, supported financially by the North Dakota Wheat Commission, shows that the highest regional densities range from 220 to 500 midge cocoons per square meter. That's well down from highs of more than 1,100 cocoons found during the 1995 survey, according to NDSU entomologist Phil Glogoza.

The highest concentrations of wheat midge cocoons occur in three areas: western Ramsey, southern Towner and Benson counties in the northeast; western Renville and eastern Burke counties in the northwest; and in LaMoure and Dickey counties.

Researchers at work

NDSU entomologist Mike Weiss says the reason for the reduction in the midge population is not entirely clear.

"Pesticide applications in 1996 may have played a role in local areas, but it's doubtful that they would have caused an overall reduction statewide," he says. Comparing the amount of time that the female midge had to deposit eggs in 1995 to the amount of time that was available in 1996 provides a possible explanation, he notes.

Weiss says adult midge require specific environmental conditions to deposit their eggs. Adult midge are active at about 9 p.m. when air temperatures exceed 59 degrees and wind speed is less than 6 miles per hour. Researchers examined records from the North Dakota Agriculture Weather Network, looking for those conditions in 1995 and 1996.

"In some locations in 1996, there was only half the amount of time available for midge females to deposit eggs as there was in 1995," Weiss says. "But until we do additional studies, we're not able to concretely demonstrate why midge populations are lower for 1996."

The survey map identifies areas of North Dakota that have high midge populations overwintering in cocoons. Densities of 600 cocoons per square meter can cause significant damage and economic loss to a wheat crop when midge emergence occurs during the heading stage of wheat, according to Glogoza. The statewide reductions in the population translate into reduced risk of infestation by wheat midge in 1997.

"In 1996, we recommended that growers in areas where cocoons exceeded 1,200 per square meter consider not growing wheat unless they were prepared to monitor their fields for adult midge, and to budget for and make timely insecticide treatments where warranted," Glogoza says.

"Weather conditions in the spring and summer of 1997 will be very important in determining if economic injury will actually occur," cautions Weiss. "If wheat is planted so that heading coincides with emergence of the midge and weather conditions are favorable for the female to lay eggs, producers will need to monitor fields to determine if a pesticide application is necessary."

What farmers can do

Wheat growers are encouraged to plant wheat as early as possible, usually an early-maturing cultivar suitable to their
By planting early, wheat can reach the flowering stage before significant levels of midge have emerged. Wheat is susceptible to midge infestation from the time the head emerges from the boot until 80 percent of the primary heads have anthers visible.

"During the past two seasons, wheat that was planted during the last two weeks of May was generally heading in early to mid-July, during the emergence period for midge," says Glogoza. "By monitoring this spring's temperatures, we should be able to alert farmers to what fields of wheat will be at greatest risk from midge."

To combat midge, wheat farmers may want to increase speeding rates and use tram lines, Glogoza says.

Increasing seeding rates reduces tillering and secondary heading, cutting the amount of time that wheat is heading and flowering. That limits the time available for midge to deposit eggs on heads.

Tram lines, established at planting, permit easier use of ground application equipment later in the season if treatments are necessary, he says.

To complete the survey, soil samples were taken by NDSU Extension agents at 12-mile intervals in areas of the state north and east of the Missouri River.

NDSU's department of entomology processed the samples and used a computer program to analyze the resulting data and generate the maps.