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A Disease Cuts Corn Yields

By STEPHANIE STROM

ALTON, Iowa — It has come on like a tidal wave, washing across the Corn Belt from Minnesota to the Texas panhandle, a disease that few farmers had seen until five years ago.

Known as Goss's wilt, it has cut some farmers' corn yields in half, and it is still spreading. This summer it reached Louisiana, farther south than it had ever been identified. Alison Robertson, a plant pathologist at Iowa State University, estimated that about 10 percent of this year's corn crop would fall to Goss's.

The disease, named for R. W. Goss, a longtime Nebraska plant pathologist, is caused by a bacterium with the formidable name Clavibacter michiganensis subsp. nebraskensis. When a plant is damaged by hail or other heavy weather, the microbe enters the wound and infects its vascular system, scarring the leaves with brownish-yellow lesions sprinkled with black freckles.

The infection may or may not kill the plant, depending on when it comes, but it almost always curtails yields. And for farmers who have never seen the infection before, it is deeply disconcerting.

"The farmer who called me had found a circle of corn about 50 feet in diameter or so that had strange symptoms, stalks broken over and twisting, discoloration, the whole nine yards," said Clayton Hollier, a plant pathologist at Louisiana State University. "I hadn't heard symptoms like that since I learned about Goss's in college."

Until 2008, Goss's wilt had been confined to western Nebraska and a handful of counties in eastern Colorado. But that year it was found in Iowa, Illinois, Indiana and Wisconsin.

In 2011, a particularly virulent year, farms in much of Illinois lost as many as 60 bushels of corn per acre to the disease (the usual yield is 200 bushels per acre). So did many counties in Indiana.

While there are no official tallies, the last two years do not appear to have been as bad — thanks in part to dry, hot weather, which tends to keep the disease at bay. But its continuing spread is worrying farmers and plant pathologists throughout the Corn Belt.

No one is certain why Goss's wilt has become so rampant in recent years. But many plant pathologists suspect that the biggest factor is the hybrids chosen for genetic modification by major seed companies like Monsanto, DuPont and Syngenta.

"My theory is that there were a couple of hybrids planted that were selected because they had extremely high yield potentials," said Dr. Robertson, whose research is financed by Monsanto and the Agriculture Department. "They also may have been highly susceptible to Goss's wilt."

About 90 percent of the corn grown in the United States comes from seeds that have been engineered in a laboratory, their DNA modified with genetic material not naturally found in corn species. Almost all American corn, for instance, is now engineered to resist the powerful herbicide glyphosate (often sold as Roundup), so farmers can kill weeds without killing their corn.

Farmers often refer to such biotech plants, which require Agriculture Department approval, as "traited," to distinguish them from traditional hybrids.

While some corn seeds are resistant to Goss's wilt, especially those sold in western Nebraska and eastern Colorado, most are not. Dan Anderson, Monsanto's lead project manager for corn, acknowledged that high-yield varieties from his and other companies might be susceptible to the disease, but added that changes in farm management might also be spreading the disease. As farmers grow more corn to satisfy the demand for ethanol, they are rotating it less frequently with other crops.

"One of the best management techniques for controlling Goss's wilt is crop rotation — corn, then soy or another crop," Mr. Anderson said.

Another possible factor is the growth of no-till farming, which leaves cornstalks, on which the bacteria can linger, to decay in the field after harvesting, rather than being plowed under.

No hybrids have been developed that can fully withstand Goss's wilt, but the companies have increased the number of seeds with higher resistance.

Ryan Forth and his father farm about 4,500 acres of land north of Ames, Iowa, about two-thirds of it in corn and the rest in soybeans. Mr. Forth is also a seed dealer for Monsanto. Some seeds in the company's DeKalb line have been identified as highly susceptible to Goss's.

After a windstorm in 2010, he said, "we started seeing these weird little circles on the foliage" in the field where the DeKalb seeds were planted.

At first they thought the marks were because of wind damage or the lack of rain — "you always suspect the weather," he said — but now he's certain it was the choice of hybrid that caused the problem.

The next year, they planted the same hybrids. "We were the poster child for Goss's that year," Mr. Forth said. "We had a complete disaster, a train-wreck kind of a yield for me."

Last year, he planted a different Monsanto hybrid and has not had a problem with Goss's wilt since. He no longer sells the DeKalb hybrids that contract the disease.