Scientists demonstrating future potential of new insect control traits in agriculture

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DuPont Pioneer researchers have discovered a protein from a non-Bacillus thuringiensis (Bt) bacterium source that exhibits promise as an alternative means for controlling corn rootworm in North America and Europe. *Science* published the finding this week.

"This research represents a breakthrough for addressing a major challenge in agriculture," said Neal Gutterson, vice president, Research & Development, DuPont Pioneer. "We have discovered a non-Bt protein that demonstrates insecticidal control of western corn rootworm with a new and different mode of action than Bt proteins currently used in transgenic products. This protein could be a critical component for managing corn rootworm disease in future corn seed product offerings. The work also suggests that bacteria other than Bt are alternative sources of insecticidal proteins for insect control trait development."

An extremely destructive corn pest, corn rootworm larvae and adults can cause significant economic loss for growers. The current biotech approach for insect control sources proteins from Bt soil bacteria. Field-evolved insect resistance to certain Bt proteins has been observed in some geographies.

Another Pioneer study related to non-Bt insect control, recently published in *Scientific Reports*, shows how RNA interference (RNAi) can be applied to control corn rootworm feeding damage.

RNAi is a biologically occurring process that happens in the cells of

plants, animals and people. By employing the RNAi process, a plant can protect itself by carrying instructions that precisely target specific proteins in pests.

"Growers need a next generation of solutions to help protect their crops. Our researchers are developing innovative, new modes for insect control to help meet future demands. Non-Bt proteins and RNA-based products highlight our efforts to identify alternative methods for effective control of insect feeding damage in agriculture," Gutterson said.

Pioneer is committed to delivering superior germplasm, native and biotech traits, seed treatments and agronomic advice for the most productive products to its customers. Pioneer has a robust product pipeline. Maintaining trait durability and promoting world-class stewardship practices are among its top priorities.

More information: U. Schellenberger et al. A selective insecticidal protein from Pseudomonas for controlling corn rootworms, *Science* (2016). DOI: 10.1126/science.aaf6056

Xu Hu et al. Discovery of midgut genes for the RNA interference control of corn rootworm, *Scientific Reports* (2016). DOI: 10.1038/srep30542

Provided by DuPont