Missouri and Kansas are releasing alien insects to do battle with invasive plants

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An alien plant species has invaded Missouri and is threatening to overrun crops and livestock pastures. To combat the scourge weed, officials are deliberately releasing two alien insect species to destroy its roots and seeds. What could possibly go wrong?

History shows that bioengineering projects can have unintended consequences. But agronomists and entomologists say there's nothing to worry about here.

The root weevil and the flower head weevil being introduced in Missouri will feed only on the noxious spotted knapweed plant, they say, and even if the alien insects reproduce into the millions, they will not disrupt the ecology, except in ways that we want them to.

"They are not going to become pests in themselves," said Ben Puttler, professor emeritus of entomology at the University of Missouri.

However safe the knapweed weevils may be, the record of deploying one species against another is spotted with repercussions that often are not understood for years or even decades. Some alien species can end up attacking native plants or disrupting the food chain in complicated ways:

An alien parasite introduced in the U.S. in 1906 to kill gypsy moths did not stop that invasive species from spreading. Instead, it now attacks more than 180 native species of North American butterflies and moths.

Asian ladybugs introduced in the 1970s to control aphids in pecan groves became so prolific they are now crowding out -- and even eating -- native ladybugs. They also invade households and stink.

Parasitic wasps introduced in Hawaii before 1950 to control sugar cane beetles are attacking native caterpillars, which are a food source for birds.

An alien weevil introduced in the 1970s to control musk thistle, another noxious weed in Missouri and elsewhere, is now threatening some native thistles in Nebraska with extinction, according to a university ecologist.

But there are many cases in which biocontrol of pests has been successful without side effects, going back to the 1880s, when an Australian beetle was released to combat a pest afflicting California citrus crops.

"Despite the risks, the consensus among experts is that properly managed biocontrol programs are invaluable," according to a 2005 report in National Wildlife, the journal of the National Wildlife Federation.

Many pest weeds and insects native to other parts of the world get introduced here by design or accident. In some cases, they thrive in the absence of other species that kept them in check in their native environment.

The theory of biocontrol is that it is better to introduce those controlling species than to rely solely on chemical killers that can be costly, harm desirable species and contaminate groundwater.

"We resort to herbicides when we have to, but we try to take advantage of Mother Nature where we can," said Bob Schultheis, a natural resource engineer with University of Missouri Extension. Schultheis is based in

Marshfield, Mo., on the front lines of the spotted knapweed war.

The plant is a member of the aster family and can grow more than three feet tall. It produces showy pink or purple flowers and 1,000 seeds or more per plant. It might look pretty, but its roots exude a chemical that is toxic to other plants. That means it crowds out and displaces food crops and forage for livestock.

"This is a very bad plant," said Tim Banek of the Missouri Department of Conservation in a recent bulletin warning farmers and the public. "It can grow from small infestations to being out of control before you know it."

Spotted knapweed is thought to have come to North America from Eurasia on boats in the 19th century or earlier. It now has spread to 45 states, and it began showing up in Missouri a few years ago, probably brought in with hay during times of drought here.

For now, spotted knapweed is mainly clustered in southern Missouri, with pockets north of St. Louis and around Kirksville. It has not yet become a problem in the Kansas City area.

Spotted knapweed is not considered as serious a problem yet in Kansas, but it is on the state's watch list. It has been particularly devastating in parts of Montana, where economic damage was estimated at $42 million in 1996.

The U.S. Department of Agriculture's Animal and Plant Health Inspection Service regulates imports and releases. Twelve species that control spotted knapweed have been approved for introduction in the United States, beginning in 1973.

Among the effective species are the root weevil and the flower head

weevil. Each lays eggs that attack the root or the seed of the spotted knapweed, killing the mature plant or reducing its ability to reproduce. Officials in Montana have reported success in controlling the spread of spotted knapweed using the weevils and an alien fly species.

"So far, they have not been found to affect any nontarget plants," said Tim Schnakenberg, an agronomy specialist with University of Missouri Extension in Galena.

Missouri is getting its weevils from a commercial supplier in Montana, which promotes the root weevil as "the king of spotted knapweed control" and sells 100 of them for $140. Each release can produce millions of insects in just a few years.

Missouri began releasing root weevils last year and flower head weevils this year. Kansas planned to begin releasing weevils this summer in the northeastern part of the state.

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