

Weed may hold key to control

CSU scientists research natural herbicide secreted by spotted knapweed plant

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Noxious weeds may soon face a powerful natural foe discovered by scientists at Colorado

State University.

Researchers recently found that spotted knapweed secretes a chemical through its roots that kills surrounding plants and weeds - a discovery with potentially major commercial applications.

CSU scientists have isolated the chemical, named catechin, which they believe may lead to an important new tool in weed control.

If catechin can be commercially produced, it could provide an environmentally friendly herbicide for controlling weeds that invade farms, ranches and gardens.

Noxious weeds are a big problem, experts say. In Colorado,

82 noxious weed species infest nearly 2 million acres of private land and cost landowners \$100 million annually in lost productivity, according to the Colorado department of Agriculture.

The weeds have displaced 10 percent of Colorado's 1,300 native plant species, and grow on 43 million acres of public lands in the state

CSU's discovery of catechin originated from a question that researcher had long pondered: Now does spotted knapweed so effectively spread at the expense of other vegetation?

"For years, scientists have talked about spotted knapweed releasing this chemical, but they couldn't find it in the soil because it was almost impossible to separate from all the other compounds that

Please see WEEDS on 4C



Natural weed killer

Spotted knapweed secretes a natural herbicide that scientists believe could be used to help control noxious weeds in Colorado such as Canada thistle, kochia, leafy spurge, musk thistle, red root pigweed and Scotch thistle.

Canada thistle



Leafy spurge



Musk thistle



Other troublesome weeds in Colorado

Absinth wormwood	Downy Brome	Japanese knotweed	Orange hawkweed	Purple loosestrife	soapwort
Black henbane	Dyer's woad	Johnson grass	Perennial pepperweed	Queen Anne's lace	St. John's wort
Burdock	Field Bindweed	Jointed grass	Perennial sowthistle	Red root pigweed	Sulfur cinquefoil
Reed canarygrass	Flixweed	Kochia	Plumless thistle	Russian knapweed	Tamarisk
creeping bellflower	Foxtail grasses	Lamb's quarters	Poison hemlock	Russian olive	Yellow star thistle
Dalmatian toadflax	Hoary cress	Meadow knapweed	Proso millet	Russian thistle	Yellow toadflax
Diffuse knapweed	Hound's tongue	Nightshade	Puncture vine	Scotch thistle	Volunteer rye

Knapweed chemical studied

WEEDS from Page 1C

naturally occur in soil," said Jorge Vivanco, assistant professor of horticultural biotechnology at Colorado State.

"We looked for it in the plant," he said. (But) spotted knapweed releases catechin into the soil through its roots."

The chemical acts as a natural herbicide against most leafy plants and weeds.

However, catechin may be especially effective in wheat fields and lawns because grassy plants appear to resist the chemical's killing power.

As a result, catechin possibly could be used as a weed eradicator that would not harm wheat and grades.

"Weeds are one of the biggest issues we have to deal with on a day-to-day basis," said Akron farmer Alan Foutz. "If there's a chance of coming up with a new method of weed control, it's something we all would want to look at."

CSU is working with undisclosed commercial companies to make catechin spray available to consumers within the next two years.

Ironically, spotted knapweed itself a noxious weed -- is immune to the effects of the deadly chemical it produces.

Spotted knapweed cells do not permit catechin to re-enter the plant once the chemical is produced and released into the soil.

"It is a clever root to produce, secrete and protect itself from this chemical," Vivanco said.

Different forms of catechins in tea leaves and grapes have been found to have antioxidant properties in human nutrition, possibly offering protection against heart disease and some cancers.

CSU scientists found that spraying catechin on plants or adding it to soil is as effective as the common chemical herbicide 2,4-D against pigweed, lamb's-quarters and other common noxious weeds.

The researchers also are conducting biotech experiments to see if the catechin-producing gene can be transferred into beneficial plants, giving them a built-in defense mechanism against weeds.

Jonathan Rife, weed inspector for Douglas County, said a natural herbicide likely would be embraced by people who worry over the environmental effects of man-made chemical weed killers.

"how much effectiveness this new extract would have remains to be seen," Rife said. "But I look forward to finding out."