

Winter Canola

An All-Around Winner

One day last fall, Agricultural Research Service (ARS) agronomist Frank Young began to fuel up a school bus with a biodiesel blend made with winter canola. The school kids who were watching him clapped and cheered when Young told them that the biodiesel would make the bus smell like French fries.



Winter canola being harvested in north-central Washington.

The students—all members of the Colville Confederated Tribes—aren't the only ones who've been applauding Young, who works at the ARS Land Management and Water Conservation Research Unit in Pullman, Washington. He's been heading up a long-term study that suggests winter canola production in some parts of Washington State could have something for everyone: a weed-suppressing alternative crop for farmers, feed supplements for cattle, biodiesel for school buses, a new income stream for members of the Colville Confederated Tribes—and a little local color.

"Winter canola blooms in May," Young says. "And when there's a whole field of yellow flowers, everyone wants to know what it is."

Looking for Alternatives

Pacific Northwest farmers who produce winter wheat must also find ways to control germination and growth of winter annual grass weeds, such as jointed goatgrass, feral rye, and downy brome, in their crop fields.

When the seeds from these grasses get harvested with the wheat, they reduce the quality of the crop, which results in lower profits for the harvested wheat.

But finding a suitable economical alternative crop that competes with the annual grasses has been a challenge. For instance, growers in this region have been reluctant to plant winter canola crops because the seedlings struggle to emerge and survive in the dry soils. Plants that do live until winter arrives are then susceptible to freezing because they don't have enough snow cover for protection.

Young's work is part of a larger partnership for north-central Washington that includes ARS, the Colville Confederated Tribes, Washington State University Extension, and local farmers and schools. The partnership was formed to develop alternative crops for providing food, fuel, and new jobs for the region. And it supports efforts by the U.S. Department of Agriculture (USDA) to reduce dependence on foreign oil and create a new

industry that benefits farmers and rural communities.

Young began his research on winter canola with Dennis Roe, a USDA Natural Resources Conservation Service agronomist who was already working with members of the Pacific Northwest Indian Coalition on growing canola as a biodiesel crop. A few members of the Colville Confederated Tribes had let Roe set up several spring canola research plots on their property in Omak, Washington—and all they had to do was water them and watch them flourish.

Encouraged by the oilseed yields from the trial spring canola crops—a little less than 1,000 pounds per acre—the scientists decided to see whether they could make the production of winter canola even more feasible than the production of spring canola. So they began a long-term study that evaluated winter canola production in Okanogan County in north-central Washington, where rainfall averages 9 inches and winters have adequate snow cover to protect the young plants.



A biodiesel blend containing oil from winter canola is pumped into a Paschal Sherman Indian School bus. Pictured left to right: Washington State University extension specialist Phil Linden, Colville Confederated Tribes member Ernie Clark, ARS agronomist Frank Young, ARS technician Larry McGrew, and local grower Ed Townsend.

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The researchers varied the planting dates, planting rates, and other establishment techniques and found that when seeds were planted in early September, the emerging seedlings did not have enough time to bulk up before the onset of winter. But they obtained consistently good yields—an average of 1,300 pounds per acre—when they planted in mid-August on 28-inch row spacing.

As a result of this research, wheat farmers in Okanogan County have begun to plant winter canola to rid their fields of feral rye and diversify their market options. And the canola crop may also help the soil store water—something winter wheat stubble could not do well. “Winter wheat has hairy, fibrous roots that don’t penetrate far below the soil surface,” Young says. “Winter canola has

roots with a huge taproot, like a carrot. It grows 5 to 6 feet deep, and we think it creates a channel through the soil that allows more water to infiltrate, which subsequent crops can use.”

The research has also been used by the USDA Risk Management Agency to expand its program for insuring canola against crop loss to Douglas and Okanogan counties. For the first time, this allows growers in these counties to obtain crop insurance for canola, which helps reduce their risks when drought or other natural weather disasters strike.

But Wait—There’s More!

The payoffs from Young’s research don’t stop in the field. Many of the farmers in this region lease crop land from the Confederated Tribes of the Colville Reservation, and the Colville tribe plans to purchase the canola seed from the growers and process it in a biodiesel production facility that they own.

The tribe plans to sell crushed canola meal back to the farmers as a protein feed supplement for cattle during the winter. They also plan to use biodiesel they produce from the canola seed oil to power the tribes’ fleet of 100 logging trucks and other agency vehicles as well as their 15 school buses.

“When the buses run on an 80/20 petroleum diesel/canola biodiesel blend, it’s enough to eliminate black soot from the exhaust,” Roe says.

In the future, as much as 20,000 acres of winter canola could be grown on Colville tribal lands. This acreage could support production of enough oilseeds for 2 million gallons of canola-based biodiesel and 6,500 tons of high-protein canola meal every year. These activities have the potential for generating annual gross revenue of \$8.8 million for the tribe and the surrounding community.

“Everyone wants this to succeed,” Roe says.

Young is delighted with how the research has provided Washington growers with a new crop—and more money. “One grower went from planting winter canola on 15 acres in 2007 to planting it on 240 acres in 2009, and his profits from winter canola ended up beating his profits from winter wheat,” he says. “This has been an incredibly exciting and rewarding project.”—By **Ann Perry**, ARS.

This research is part of Soil Resource Management (#202), Agricultural System Competitiveness and Sustainability (#216), and Bioenergy (#213), three ARS national programs described at www.nps.ars.usda.gov.

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The USDA-ARS Land Management and Water Conservation Research Unit contributes to the USDA Northwestern Regional Biomass Research Center, which is one of five national centers whose mission is to help accelerate the establishment of commercial biomass production from farms and forests in ways that do not disrupt food, feed, and fiber markets and that enhance natural resources quality.