



Bringing Crop Rotation to Winter Wheat Producers

by

Mark Boyles, Assistant Extension Specialist, Canola

and

Thomas Peeper, Warth Distinguished Professor of Agronomy

Department of Plant and Soil Sciences- David Porter, Head

Mission Statement: To provide research, education, and demonstration to stimulate the development of winter canola as a major profitable rotational crop with winter wheat.

Executive Summary:

- OK wheat growers suffer severe competitive disadvantage due to their widespread practice of growing only wheat for decades. Pest problems have multiplied and yields have failed to increase over time, in stark contrast to steady and major increases in yields of wheat and other crops elsewhere .
- The Okanola Project was conceived in 2003 as a vehicle to introduce winter-hardy canola as a profitable rotational crop for Oklahoma Wheat Growers to aid in pest management, improve wheat yields and quality, and facilitate adoption of no-till crop production methods by wheat growers.
- Winter canola has been commercially grown in OK for only 5 years. The first adapted winter hardy variety was introduced in 2001.
- In the past 4 years, great strides have been made in accomplishing the mission of the Okanola Project.
 1. Basic production technologies have been developed through research and on-farm trials.
 2. Multi-peril crop insurance has become available as a result of demonstrating successful production.
 3. Producers Cooperative Oil Mill in OKC will begin crushing canola seed this summer (2008).
 4. Producers now have Act of God contracts available from Plains Oilseed Products at good prices.
 5. Demand for canola oil still exceeds supply and is increasing faster than the demand for grains.
 6. Since the Okanola Project started, OSU has hired an Assistant Extension Specialist for canola, an Extension Oilseed Specialist, and a canola breeder (shared with KSU, 40% OSU). A new grant-funded (3 yrs) Assistant Extension Specialist-Canola is planned for the OCES Area Office at Enid beginning July, 2008.
 7. OSU production research, variety improvement, and educational efforts are positioned to continue vigorously to support the anticipated major increase in canola acreage. This will ensure long term success of winter canola as a profitable rotational crop for OK wheat growers and thereby improving their economic viability and ability to compete in world markets.
 8. Introducing a new crop requires changes in farming and business operations throughout the system. Canola is not a grazed crop, thus, cattlemen have been less enthusiastic than crop producers.

Background:

Because of climatic and soil limitations, most Oklahoma farmers have clung to a monoculture of winter wheat with practically no crop rotation for the last 50 years. Lack of crop rotation has increased production problems for wheat. One troublesome change has been the large increase in winter annual grassy weed species, including wild oats, jointed goatgrass, Italian ryegrass, cheat, rescuegrass, and feral rye. Over the

years, wheat growers have tried using summer rotational crops in efforts to break disease cycles and weed problems. Success with soybeans, corn, and sorghum has been very limited due to low rainfall-use-efficiency during the hot dry summers in the Great Plains and lack of heat stress tolerance in these crops. Oklahoma growers needed a profitable winter rotational crop with winter wheat that was not a host to the diseases of cereal grain crops and that would permit use of alternative weed control strategies. Efforts to introduce canola for this purpose 20 years ago failed because cultivars then available were not winter hardy. Winter hardy varieties have been introduced during the past few years and herbicide resistant varieties are now available which offer excellent opportunities for wheat growers to clean up their fields.

A second troublesome issue is that wheat yields continue to remain flat in OK, despite all the new and “improved” varieties, new weed, disease and insect control options available, improvements in equipment, etc. For example, the OK statewide average wheat yield over the past five harvests (2003-2007) is 31.6 bushels per acre. Twenty years earlier, i.e. 1983 through 1987 harvests, the 5-year average yield was 31.4 bushels per acre. We gained only 0.2 bushels per acre in 20 years. When we consider that the harvested acres dropped from a mean of 5.2 million during ’83-’87 to only 4.4 million over the past five harvests, due to the worse land being taken out of production and placed into the CRP, we could argue that yields have probably declined. Thus, yields of wheat in Oklahoma haven’t followed trends seen in other crops like corn, cotton, and soybeans. Failure of mean wheat yields to rise over time in OK has put our wheat growers at a severe competitive disadvantage to European growers who have seen a dramatic 23.4% increase in their wheat yields over that time frame to a mean of 79 bushels/acre. Thus, the concept of the Okanola project was developed as a fresh approach to addressing wheat quality and production issues. The purpose is not to introduce a new crop to replace wheat, but to foster a crop rotation in the traditional wheat-only system to break weed and disease cycles and to improve yields and the marketability of Oklahoma wheat.

While canola oil is a potential biofuels, it is also the healthiest cooking oil widely available. In 2006 the FDA approved a qualified health claim for use of canola oil (improved human heart health) and demand has escalated rapidly. This past year NYC, Chicago, etc have legally required an end to the use of unhealthy oils (vegetable oils with trans-fats, palm oil, etc) in restaurant food. Over the past year major restaurant chains have started featuring their use of canola oil in efforts to boost sales. The meal remaining after oil removal is a high quality animal feed marketable in OK. Thus, the future of this crop seems very bright.

History of the Okanola Project:

In the 2002-03 winter crop season, Dr. Peeper evaluated a few new canola varieties from Kansas State University, SW Seed, and Monsanto, which finally demonstrated adequate winter tolerance for OK. Seed yield in small plots trials was very satisfactory.

In June 2003, Mark Boyles was employed to assist with canola efforts and OSU initiated the “OKANOLA” project that fall with the mission to provide research, education, and demonstration to stimulate the development of winter canola as a major profitable rotational crop in Oklahoma.

Due to very limited seed supplies, 10 growers were selected in northwestern counties and provided with seed and training for these first on-farm studies. One of the first major issues was calibration of their wheat drills to seed canola. This was solved by developing a drill calibration kit to allow growers to calibrate their drills with a volumetric method instead of by weight, assuming that the seeding rate was the recommended five pounds per acre. These calibration kits have been very easy to use and well received by growers. The OSU Agronomy Club students assembled and sold 1000 of these kits last fall at a nice profit for the club.

In 2004-05, grower production studies were conducted with DeKalbs’ DKW 13-86 and DKW 13-62 Roundup Ready® winter canola. The program was greatly expanded to include 16 counties in northwestern Oklahoma with 76 growers each seeding 80 to 160 acres. Growers were provided with winter canola production training through OSU Cooperative Extension Service personnel within each county. This program was a success with an average yield of 1,600 pounds per acre for 16,000 acres of Roundup Ready® and conventional winter canola. It was also a success by controlling winter annual grasses infesting traditional wheat fields.

Marketing was an issue because the closest crusher was in North Dakota. J & M Mushroom of Miami, OK consumes some whole seed canola as mushroom growth media, but not enough to support major production.

Today (2007-2008) Oklahoma has approximately 30,000 acres planted within the state and we offer direct extension support to farmers growing another 8,000 acres in south central Kansas. The Okanola Project has tackled many problems involved with introducing a new crop.

Staff increased:

In 2005-06, a joint OSU-KSU canola breeder (Mike Stamm) was hired and OSU hired an oilseeds extension specialist for canola, soybeans and peanuts (Dr. Chad Godsey). Currently, we are expecting a grant required to place an extension canola specialist in the Enid OCES office to work directly with new growers to introduce canola / wheat rotations. Thus, OSU continues to expand its research, education and on-farm efforts to introduce, establish and maintain winter canola as a profitable rotation crop with winter wheat.

Efforts to introduce no-till methods:

In 2006-07 research confirmed that canola was growing well in conventional tillage, but in no-till many plants died over the winter months. This was viewed as a serious problem because we viewed a winter canola-winter wheat rotation as a means for OK wheat growers to finally adopt no-till production methods. OK has lagged behind most other states in adoption of no-till. In the fall of 2007, with support from Monsanto and John Deere we conducted a no-till direct seeding project with a new seeding equipment concept from John Deere that moves most of the residue from the row and places the fertilizer below and beside the seed. We planted 10 forty-acre blocks of winter canola in western Oklahoma with John Deere's new 40-foot-wide 1870 drill and the grower planted the rest of the field with his standard disk opener no-till drill. Results indicate successful stand retention over the winter for the direct seeding canola into no-till wheat stubble. This project will help solve the stand failure issue with no-till canola and continue to encourage growers to adopt limited or no-till production practices.

Other steps forward:

Some key steps forward in the project include evaluating and introducing seed treatments to control major fall aphid pests, establishing a statewide variety testing program, initiation of breeding efforts to develop more winter tolerant higher yielding varieties, assisting USDA-RMA efforts to introduce multi-peril crop insurance, developing informational materials such as fact sheets, production guides and the OSU canola web site, conducting the annual statewide canola conference, development of the new Great Plains Canola Association under the umbrella of the U.S. Canola Association, obtained OK legislative approval for a new checkoff program for oilseeds. In addition, OSU fertilizer recommendations are now available, major insect pests have been identified and threshold levels have been established, and major advances have been achieved in getting wheat growers to consider and understand the need for crop rotations.

“Working Together Works Better”-- the slogan for the Okanola Project

In addition to members of Plant and Soil Sciences, many people have become involved in the efforts of the Okanola Project, including faculty in Entomology and Plant Pathology, Agricultural Economics, Biosystems and Agricultural Engineering, and OCES staff across the state. We have learned to work closely with agribusiness and input suppliers. The Okanola Project would not be a success without the enthusiasm and support of Bayer CropScience, DeKalb Seed, Great Plains Canola Association, John Deere, Land O' Lakes, Monsanto, Oklahoma Wheat Commission, Plains Oilseed Products, Producers Cooperative Oil Mill, SW Seed, Syngenta, and W.B Johnston Grain, plus local agribusiness organizations and several Oklahoma wheat growers. The upcoming Oklahoma-Kansas canola conference is scheduled in Enid, Okla. on July 15. For more information on winter canola in the Great Plains see www.canola.okstate.edu.