

## CANOLA

### An Emerging Oilseed Alternative

#### Overview

Canola is rapidly gaining acreage as a rotation alternative with small grains and other crops. Grown in several regions of the U.S., canola has strong demand as a healthy vegetable oil. Canola's main selling point has been its low level of saturated fats, making it popular as a cooking oil and for use in processed foods. Many movie theatre chains have switched to making popcorn with canola oil instead of using imported coconut oil. This increasing acceptance of canola oil among American consumers has led to expanded production opportunities for U.S. producers, and yet the growth in acreage has not kept up with demand. U.S. production has been increasing and is now more than a million acres. In 2002, the U.S. is expected to import more than 1.5 million acres worth of canola, primarily from Canada. Canola oil has also become popular with consumers in many other parts of the globe, and export opportunities may become available.

Canola can be grown with conventional grain crop equipment, though adjustments need to be made for its small seed size. Both spring and winter (fall-planted) types of canola are available, but normally winter canola will yield best in Missouri. Growing winter canola is much like growing winter wheat. Canola has an advantage over winter wheat in that it often matures earlier by a week or more. This is good for double cropping. On the negative side, canola has to be planted earlier than wheat, and this can cause challenges in fitting it into a rotation (see production practices on page 2). Canola yields a little less than wheat, but has a higher price and usually a greater net profit, depending on the cost of transporting it to a buyer.

#### Growth and Development

Canola, a broadleaf plant, does a better job than wheat of protecting the soil from erosion during its early growth. Canola is a member of the mustard family and develops a thick rosette of leaves close to the ground before beginning to send up a flowering stalk. With winter types of canola, flowering is delayed until



spring. The rosette of leaves normally dies at some point during the winter, but the crown (thickened root-stem area) will stay alive in a dormant state during the winter. In early spring, leaves will start to regrow from the crown, and an elongated stem will emerge around the first of April. In central Missouri, canola is usually in full flower around the second or third week of April, creating a brilliant sight with its bright yellow flowers.

Canola pods form first on the lower stem, and gradually develop towards the top of the plant. Bottom pods are typically 12 to 18 inches from the ground, with mature plants reaching 4 to 5 feet tall. Each canola pod will have several seeds in a single row; pods are somewhat prone to splitting open (shattering) if harvest is delayed too long. Canola plants are highly branched, which helps the plant compensate for thin stands.

#### Canola's Place in the Rotation

Winter canola provides an excellent rotation crop with wheat in Missouri, and can be used as the first crop in double crop systems, such as canola-beans, canola-buckwheat or in southern Missouri, canola-sorghum. Any time another crop, such as canola, is added to a rotation, research has shown that the other crops in the rotation will generally yield better, and pest pressures will be reduced. Canola may offer potential for reducing soybean cyst nematode populations, since certain compounds in canola residue are believed to suppress nematode growth (more research on this is needed).

Fitting canola into a rotation after winter wheat works well, but it is more difficult to fit canola in after corn or soybeans. Canola needs to be planted in September, almost a month earlier than wheat, when soybeans, corn or

*(continued on page 4)*

# How to Grow Canola

## Site Selection

As with most crops, canola will perform best on well-drained, fertile, silt loam soils. It should not be planted on flood-prone ground or soils that are poorly drained. Overly wet soil conditions during the winter will almost always lead to winter kill. Soils that have high clay in the topsoil can also be problematic for canola. The shrinking and swelling of the clay soil can heave the canola crown out of the soil in early spring, making it more exposed to weather injury.

## Field Preparation

Canola can be planted no-till, but better results are often achieved through tilling the field first. Since canola needs to be planted relatively shallow, a finely-prepared, packed and clean-tilled seedbed allows more uniform seeding depth. Tillage can help with incorporation of fertilizer into the rootzone, improving fall growth and reducing the chance of insect injury to emerging seedlings. However, if soil moisture is limited at time of planting, no-till may be preferable to retain seed zone moisture. A minimum-till pass that leaves the ground rough is not recommended for canola given its shallow seeding depth.

## Varieties and Seed Sources

During the 1990s, a number of winter canola varieties were released in the U.S. Unfortunately, the majority of these varieties are no longer being actively distributed due to mergers and changes in plant breeding companies. On the positive side, an active university breeding program has been operating in Kansas for the last several years to develop varieties for the Great Plains region, extending eastward to Missouri. Two new varieties released from that program are Wichita and Plainsman. Wichita matures a few days earlier than Plainsman and seems to have slightly higher yield potential, but Plainsman may have more outright cold tolerance. Either of these varieties is a good choice for Missouri, and both are available through Kansas Foundation Seeds (785-532-6115). Only a few winter canola varieties are currently available from the private sector (contact the Jefferson Institute, 573-449-3518, for the latest information on varieties). Seed prices for canola are generally \$2-3 per pound, plus shipping cost.

## Planting

Establishing canola is relatively easy, provided adequate soil moisture exists. The crop should be seeded in narrow rows (6 to 7 inches wide) using a grain drill at a rate of about 6 pounds per acre. Ideal seeding

depth is about 1/2 inch. If planted too deep, the tiny canola seedlings may not be able to emerge.

The greatest challenge with planting canola is completing the task by the appropriate date. Canola should be planted by September 10 in north Missouri, by September 20 in mid-Missouri and by the end of September in southern Missouri. If planted too late, canola plants and crowns will be smaller entering the winter, and much less likely to survive until spring. If canola is planted too early (such as early August), it may start flowering in the fall. If fall flowers appear on the plants, the chance of winter kill greatly increases.

## Fertilization

Fall fertility with winter canola should be aimed primarily at getting the plant to survive the winter. Past studies on canola fertility in Missouri have shown that application of nitrogen in the fall can increase crown size and improve winter survival. Fall nitrogen should be supplied at 50 lbs./acre, with nitrogen sidedressed in the spring at 80-100 lbs./acre. Phosphorous fertilizer has also improved winter survival of canola on some soils, but may not be necessary if soil test shows high P in the seed zone. Potassium should be applied if recommended by soil test (recommended levels for wheat can be used if canola rates are not available). In some U.S. research trials, canola has been responsive to supplemental sulfur, having a higher need for this nutrient than most crops. However, limited tests with sulfur on canola in central Missouri have not shown a response. Soil pH is recommended to be in the 6.0 to 7.0 range for canola.

## Pest Management

### *Weed control*

Once established, winter canola is very competitive with weeds. Weed control strategies should be aimed at reducing weed competition during seedling emergence, either by mechanical or chemical\* means. The main pre-plant herbicide option for canola is Treflan, although Prefar is also labeled. Post-emerge options are Poast, Select, Prizm, Stinger and Assure II for grass control. After harvest, it is common for canola seeds left in the field to germinate with the first rain, leading to a flush of volunteer canola. These volunteers are easily controlled with broadleaf herbicides or by mechanical means, and for double crop purposes, volunteer canola is probably no worse than volunteer wheat.

## **Insects**

As a member of the mustard, or Crucifereae family, there are a wide range of insects that are attracted to canola. Fortunately, winter canola in Missouri is unlikely to suffer a yield loss from insects. Probably the most susceptible time for winter canola is during seedling emergence in no-till conditions. In the first year of no-till canola research trials at the University of Missouri, a high percentage of canola seedlings were killed by insects, leading to use of a soil applied insecticide at planting time in later no-till trials. During flowering and pod-fill of winter canola, a few insects are likely to appear in the field, but unlikely to require spraying. Spring canola is another matter, since pod-fill occurs a few weeks later than winter canola. Stink bugs, cabbage moth larvae, lygus bugs and other insects can cause significant damage to pods and seeds of spring canola in Missouri. Insecticides registered for canola are Capture, ethyl parathion, methyl parathion, Helix (seed treatment) and Gaucho (seed treatment).

## **Diseases**

In several years of canola research in Missouri, plant disease has occurred occasionally but not regularly. The only disease to show up every year in Missouri canola is aster yellow, which is a mycoplasma that causes terminal bud deformation on a small percent of plants (usually less than 5%). Sclerotinia is one of the worst threats to canola; rotating canola on a four year interval and growing canola after a grass crop can reduce the probability of getting this disease. Soybeans and sunflowers are also hosts to sclerotinia. Sclerotinia causes stems to rot during spring growth and can completely kill a plant. Canola seed is usually treated with a fungicide to avoid seedling diseases. With winter canola, the crown tissue that keeps the plant alive may develop rot diseases if weather conditions cause crown injury. Fungicides registered for canola are Quadris, Ronilan, Allegiance and Helix (seed treatment).

*\*Pesticides mentioned as being labeled in this publication are based on reference lists published in the Thomson Publications "Quick Guide" on crop pesticides, 2002 edition. These lists are believed to be accurate, but given the changing nature of herbicide registrations, labels and relevant government regulations should be checked before applying any pesticide.*

## **Organic Production**

Canola, a vigorous winter annual, can be grown by organic methods. Effective weed control with cover crops or tillage prior to planting can eliminate the need for herbicides. Insect control is not normally needed, but pyrethrums or other organic insecticides can be used. Nitrogen for fall growth of canola can be supplied from a cover crop or preceding legume such as soybeans. Perhaps the greatest challenge is getting adequate nitrogen for spring growth. A manure application or other supplemental organic nitrogen may be needed in the spring, but care should be taken to avoid injury to the canola vegetation. Markets for organic canola exist, but distance to a certified organic crusher could lead to costly transportation.

## **Harvest and Storage**

Canola is harvested much like winter wheat by using a platform (all-crop) grain head. Since pods are normally over a foot from the ground, the cutter bar can be run fairly high. Cylinder speed should be 450-650 rpm. Concaves should be 3/4 inch in front and 1/8 to 1/4 inch in the rear. Air speed should be relatively slow, such as 400 to 600 rpm. The top sieve should be set at 1/4 to 3/8 inch and the bottom at 1/8 to 1/4 inch.

Winter canola in Missouri will drop its leaves prior to harvest and is ready to combine shortly after the plants turn completely brown. Harvest should not be delayed too long, because canola pods may begin splitting (shattering) within a couple weeks of turning brown, especially if storms occur. Canola combines fairly easily and leaves less residue than wheat. Since canola seeds are small, holes and cracks in combines and grain trucks may need to be sealed up with duct tape. Tarping of grain trucks is also recommended.

Canola should be at no more than 9% moisture for long term storage. Drying temperatures should be kept to 110°F. or less. Since canola is high in oil, it should not be left sitting on a truck overnight. If moisture is high, it will heat up quickly. Canola seed should not be stacked too deep in a bin, since air flow takes more force between the small seeds. For trucking at highway

## *Canola's place in the rotation (continued from page 1)*

sorghum may not yet be harvested. To fit canola in after corn, the corn may have to be combined at higher moisture, or an earlier maturing hybrid might need to be used. Following summer annual crops with canola is easier in the southern part of Missouri than in the central and northern portions of the state.

Canola is sensitive to several long residual herbicides. Compounds that have a recommended waiting period of 16-18 months between application and planting canola include Ally, Accent (if pH above 6.5), Atrazine, Beacon, Canopy, Classic, Command, Commence, Dual, Glean, Lorox Plus, Princep, Reflex, Scepter, Squadron, Tornado, and Tri-scept. Compounds with a 12 month waiting period are Devrinol, Lexone, Salute, Sencor, and Turbo. Particular caution should be taken to avoid fields that have had Pursuit applied recently, since the recommended waiting period is 26 months for this herbicide. As always, check the product label for more specific guidelines.

From the stand-point of disease build-up, it is best to fit canola in between grass crops. In some states, it is recommended to have a three year interval (between harvest and planting) of canola and sunflowers, two years between canola and soybeans or alfalfa and a one year gap between canola and dry edible beans, cotton, potatoes or clovers. The main disease problem that can build up between soybeans, sunflowers and canola is sclerotinia stem rot, and has occasionally been seen in Missouri. In most years, soybeans could be double cropped after canola with no disease occurring, but long term rotation planning should seek to minimize potential for disease.

### ***Double cropping canola***

When used in double crop systems, canola has two advantages compared to wheat. Canola generally matures earlier than wheat, as much as a week to 10 days earlier depending on variety. This can allow earlier planting of the double crop. Canola also leaves less residue in the field than wheat, which makes no-till planting of the double crop an easier task. Studies in Missouri were done with several double crops planted at the same date after canola or wheat. Equal double crop yields were obtained after both crops, indicating canola has no allelopathic or negative effect on the double crops tested (soybeans, pearl millet, buckwheat, sunflower and amaranth).

## **Marketing opportunities**

A primary limitation to canola in Missouri is the current lack of in-state markets. For a couple of years around 1990, contracts for canola were offered in Missouri with local delivery points available. The crop was shipped to an oilseed processing plant in western Tennessee. Approximately 2,000 acres of canola were produced in the state. Unfortunately, that processor stopped buying canola and the next closest processors were in Georgia and Canada. Lack of processing in the region and winter kill problems led to the loss of Missouri canola acreage in the early 1990s.

Fortunately, the number of U.S. processors for canola has increased in the last 10 years. Currently, the closest processors that have crushed canola are in western Kansas and eastern Colorado. If an acreage base for canola were to redevelop in Missouri, in-state processing would become potentially feasible, especially through smaller facilities. One regional buyer for canola is JM Farms in northeast Oklahoma (contact the Jefferson Institute for more information on buyers).

## **Economics**

In recent years, canola has been able to benefit from the same price subsidies as other commodity crops, strengthening the profit potential of this crop. In most side-by-side tests, canola has provided a greater net profit than wheat, though ease of marketing and variability in yield are off-setting factors. Production costs for canola and wheat are similar, with the main difference being the extra cost of transporting canola a longer distance to market. In no-till systems, a soil insecticide may be needed for canola, but would not be for wheat. Though canola yields generally run a little less than wheat, prices per bushel have been significantly higher most years.



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