



EM4833

# Oilseed Rape Keeps Irrigated Land Productive during Drought

If you have thought about fitting oilseed rape or canola (*Brassica napus* L.) into your irrigated rotation systems, this might be a good year to start. Limited water supplies may make it impossible to grow traditional annual crops, such as corn and beans. Rather than increasing the stockpiles of wheat, try growing winter canola.

Canola (rapeseed containing less than 2% erucic acid and less than 30  $\mu$ moles/gram of glucosinolate in defatted meal) has increased in Northwest acreage from near zero in 1983 to more than 30,000 acres in 1987. Most canola is exported to Japan and Canada. Contracts are available through a number of companies.

Canola oil is rapidly gaining acceptance in domestic markets because it contains the lowest saturated fat and highest unsaturated fat (primarily monounsaturated) of any edible oil, with moderate levels of polyunsaturates, including the essential fatty acids linoleic and alphinolenic acids.

Winter rapeseed falls under two categories: edible and industrial. Most rapeseed grown in the Northwest is canola, or the edible type. Industrial rapeseed contains greater than 40% erucic acid and is used in preparing lubricants, rubber compounding agents, fibers, plastics, waxes, surface active agents and chemical intermediates. Rapeseed meal is an excellent source of protein supplement (above 40%) for livestock. However, the presence of high glucosinulates (above 30  $\mu$ moles/g of defatted meal) is not suitable for livestock.

## Preparation and Planting

To raise a crop of winter rapeseed or canola, prepare the seedbed as you would for small grains. Apply 100 to 150 pounds per acre of nitrogen and 25 pounds per acre of phosphorus. Use an appropriate herbicide to control weeds. Sow winter rapeseed and canola in mid-August through the first week of September. Allow at least 30 days growth before the first frost. Plant at an 8-pound-per-acre rate using a double-disc grain drill set at a 1- to 2-inch depth. Broadcast seeding may be done, but be sure the seed is buried at least 1 inch to promote good root development. Planting seed too deep may result in a heavy stand loss.

Plant into good moisture. It is best to pre-irrigate before planting. Irrigation at this time is essential to establish a good stand. The crop should reach at least the eight true leaf stage before going dormant in late fall.

In mid-April the crop will elongate and flower. Ground moisture at this time is most important to initiate and fill seed pods. Apply water by rills or sprinkler systems. Growth at this time is rapid. Plants will grow from 12 inches on April 1 to 4–6 feet by April 30. Hand lines are impractical after April 15. If hand lines are used, apply all water during the bud stage prior to open flower. Plan irrigation methods according to plant height.

In 1986–87 research was conducted at Washington State University's Irrigated Agriculture Research and Extension Center at Prosser to determine spring irrigation scheduling and its effect on winter rapeseed yield and quality.

All plots were planted August 31, 1986 on a pre-irrigated field. Soil moisture was kept optimum for seed germination and growth before winter. Treatments of two, three, and five spring irrigation periods were applied to each subplot as follows.

**Treatment 1:** No irrigation in the spring.

**Treatment 2:** Water was applied twice: 4/16/87 and 5/2/87.

**Treatment 3:** Water was applied three times: 4/16/87, 5/2/87, and 5/13/87.

**Treatment 4:** Water was applied five times: 4/16/87, 5/2/87, 5/13/87, 5/29/87, and 6/12/87.

Ground moisture was monitored before and after each irrigation with a neutron probe. Water applied was calculated by taking flow rates and averaging them over each 24-hour irrigation period.

Irrigation at full flower doubled seed yields when compared with nonirrigated rapeseed, as indicated in Figure 1. Water use efficiency was maximum if no water was applied during spring even though the yield was low. It gradually decreased as the amount of water applied increased (Figure 2).

Five spring irrigations, resulting in a net soil moisture increase of 5.22 inches, increased seed yields of both cultivars Santana and Lindora. Significant increases in seed yields of both cultivars were observed at five irrigations. This would suggest that late irrigation at seed filling is beneficial to seed yields. Shut off all irrigation by the second week of June to allow the crop to dry for a late June to early July harvest.

Harvest should occur when the seed has turned brown and the pods have turned yellow. Growers need to check their crops regularly for maturity, then harvest immediately when the crop is mature. Seed moisture should be below 10%. Rapeseed shatters easily; growers should take great care to harvest at the proper time. Harvest using a

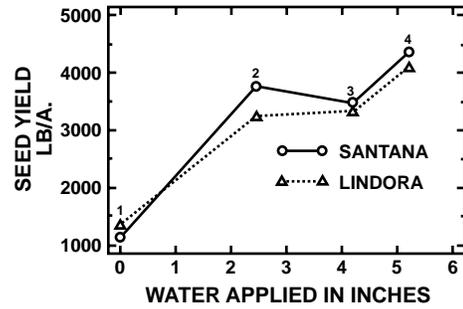


Fig. 1. Effect of irrigation on seed yield of winter rapeseed cultivars Santana and Lindora at Prosser, WA. 1987.

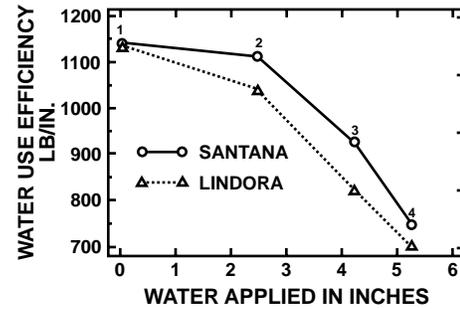


Fig. 2. Effect of irrigation and water use efficiency on winter rapeseed cultivars Santana and Lindora at Prosser WA. 1987.

small grain combine. Rapeseed is very small (1/16–1/13 inch in diameter) and light, so turn combine fans way down to avoid seed loss. Allow twice as much time to harvest rapeseed as wheat. Harvest only the seedbearing branches of the plant. Allow ample time for experimentation and setting fan speeds. Check combine for leaks. Wheat may not leak through your combine, but small rapeseed can leak to the point that you suffer an expensive loss.

Winter rapeseed and canola may be good alternate crops for drought periods in the Pacific Northwest. Most of their irrigation requirements occur during spring runoff when water is most likely to be available. Yields of 3000–4500 pounds per acre can be expected under limited irrigation, provided that adequate soil moisture is available during early growth stages in the fall.

Rapeseed breaks up disease and weed cycles commonly associated with small grains. Deep tap roots, 10–14 inches long, help break up com-

pacted soil and aid in soil erosion control. Existing small grain drills and combines can be used, so there is no need to buy special equipment. Canola also has a ready market. Most seed is sold soon after harvest. A grower should obtain a contract with a canola or rapeseed company before planting to ensure a market for the crop.

The Washington State Department of Agriculture has established separate production districts for edible rapeseed (canola) and industrial rapeseed to promote seed quality and to prevent mixing seed, which results in poor oil quality. Most districts in Washington are growing canola (edible) varieties. Growers should check with their county Extension office to find out which type of rapeseed can be grown at their location.

Information on soil moisture monitoring and crop evapotranspiration from Washington's Public Agricultural Weather Stations (PAWS) and Washington Irrigation Scheduling Expert (WISE) are available on the Scientific Irrigation Scheduling (SIS): web page <http://sis.prosser.wsu.edu>

Drought advisories and other Washington State University Cooperative Extension Bulletins are available online at <http://pubs.wsu.edu>  
Type "drought" in the search box for downloadable files.

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