# WINTER RAPESEED SEEDING RATE AND DATE GUIDE

**Stephen O. Guy and Mary Moore**

Seeding rate and time of planting for winter rapeseed (*Brassica napus,* L.) and winter Canola (an edible oil class of rapeseed) can influence crop productivity, winter survival potential, competitiveness to weeds, maturity date, and potential insect damage. The successful establishment of a desired population of plants at the appropriate time in the growing season is the first step in determining crop productivity. Fall seeded rapeseed must grow large enough to survive winter conditions and begin vigorous growth in the spring. Crop competition with weeds is a first line strategy for weed control that is directly influenced by seeding rate and planting date decisions.

## Rapeseed Seeding Date

In northern Idaho and other Pacific Northwest areas with similar growing conditions, winter rapeseed is usually planted during August. Delay of planting into September may cause the crop to be less developed and limit the crop's ability to survive winter conditions. Late planted rapeseed may not cover the soil surface adequately for erosion protection. Early planting conforms to planting date recommendations found in the *Dryland Winter Rapeseed Production Guide*, EB715. Normally, planting in August requires the use of summer fallow fields to provide soil moisture for successful plant establishment. If planting could be delayed into September, there are years when recropping could be successful. The rapeseed breeding program at the University of Idaho is developing winter rapeseed cultivars with improved fall establishment and in the future may have varieties that are adapted for later planting. With currently available varieties, late planting is risky in most years.

Winter rapeseed trials evaluated crop performance across two cultivars. The average for both seeding dates in either August and September showed higher seed yield from August plantings than September plantings (Table 1). The August 9, 1991 planting produced sub-optimum plant stands due to hot, dry planting conditions. Yields were nearly 900 lb/a less in late September than in

University of Idaho College of Agriculture
Cooperative Extension System ❑ Agricultural Experiment Station CIS 1029

August planting in the 1992/1993 growing season. The amount of oil, the erucic acid content of the oil, and the winter survival rate did not change with planting date in these experiments. Most likely winter survival rate was not influenced by planting date because of mild winters during both experiment years. However, seed weight and plant height did decrease as planting was delayed. Bloom dates were over 8 days later in the 1991/1992 experiment and almost 3 days later in 1992/1993 experiment as planting was delayed from the end of August to the end of September. These delays may put the crop at greater risk of insect damage, heat stress or late season moisture limitation; but may allow later planted rapeseed to avoid late season frost at flowering. The results of these trials demonstrate that planting in August is important agronomically for the cultivars 'Dwarf Essex' and 'Bridger' used in these experiments. When varieties selected for late establishment become available, negative effects of late seeding should be reduced.

**Seed rapeseed early enough to allow for good winter survival; in mid to late August for current varieties.**

Table 1. Winter rapeseed performance under four seeding dates at Moscow, Idaho.

| Planting date | Seed yield lb/a | Seed oil % | Erucic acid % | Seed weight g/200 | Plant height inches | Bloom date Julian | Plant stand 1000/a | Winter survival % |
|---|---|---|---|---|---|---|---|---|
| *1991/1992 experiment* | | | | | | | | |
| August 9 | 1974 | 39.1 | 50.0 | 1.09 | 55.3 | 110 | 76 | 82 |
| August 24 | 2429 | 40.0 | 50.6 | 1.10 | 56.2 | 111 | 511 | 97 |
| Sept. 9 | 2039 | 39.8 | 50.0 | 1.06 | 51.6 | 114 | 579 | 109 |
| Sept. 20 | 2087 | 39.8 | 50.2 | 0.97 | 45.5 | 120 | 417 | 85 |
| LSD 0.05* | n.s. | n.s. | n.s. | 0.03 | 3.4 | 1 | 109 | n.s. |
| *1992/1993 experiment* | | | | | | | | |
| August 11 | 2292 | 40.1 | 52.1 | 1.03 | 58.9 | 133 | 302 | 52 |
| August 25 | 2325 | 39.8 | 52.6 | 1.03 | 58.8 | 134 | 387 | 54 |
| Sept. 8 | 2005 | 40.2 | 52.3 | 1.05 | 57.9 | 135 | 382 | 54 |
| Sept. 21 | 1430 | 39.6 | 52.2 | 0.96 | 47.3 | 137 | 280 | 46 |
| LSD 0.05* | 422 | n.s. | n.s. | 0.05 | 2.5 | 1 | 34 | n.s. |

* Values differing by more than the LSD are significantly different at the 5% level; n.s. indicates no difference among values.

## Rapeseed Seeding Rate

Seeding rate directly influences crop stand density. The final stand of winter rapeseed depends upon establishment rate (the number of seeds planted that produced harvested plants) and winter survival. Stand density can also influence crop yield, quality, lodging, winter survival, and weed competitiveness.

Winter rapeseed small plot seeding rate experiments were conducted using Dwarf Essex and Bridger near Moscow, ID in 1991/1992 and 1992/1993 growing seasons. Seeding rates were 4, 6.7, 9.3, and 12 lb/a in both experiments and resulted in plant stands ranging from a low of just over 200,000 plants/a to about 500,000 plants/a across the seeding rates. Plant establishment rate was highest for the lowest seeding rate in both years. Over 60 percent of the seed sown established plants in 1991/1992 and over 80 percent did in 1992/1993 at the 4 lb/a seeding. But under 40 percent in 1991/1992 and under 60 percent in 1992/1993 of the 12 lb/a seeding rate established plants. In fact, the lowest seeding rate stand was about 40 percent of the highest seeding rate's stand because of a higher establishment rate.

In the 1991/1992 experiment there was a significant yield response to seeding rate at the second (August 24,

**Seed 2 to 4 lb/a of seed under good establishment conditions, or 6 to 8 lb/a for poor conditions.**

see planting date section) and third (September 9) seeding date (Figure 1). Each 2.7 lb/a decrease in seeding rate corresponded to about a 200 lb/a greater yield for the second planting date and about 125 lb/a increase for the third date. At the first planting date, there was difficulty in establishment due to hot dry weather and the plant stands were too low to be useful. In the latest planting date (September 20) no seeding rate response was found. Thus, for the two recommended seeding dates, the highest yields were achieved with the 4 lb/a seeding rate. In the 1992/1993 experiment there were no significant yield differences among the seeding rates.

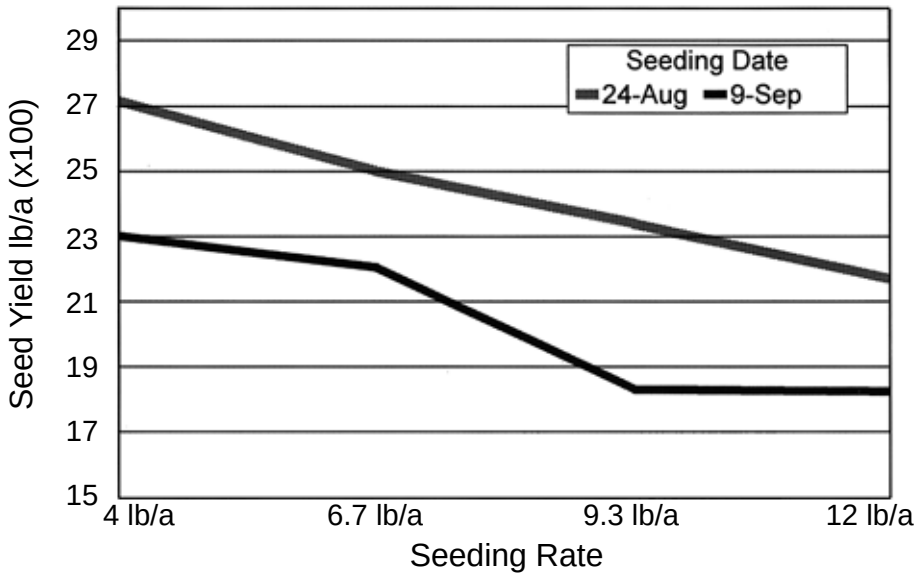
**Set drills accurately at a reasonable rate and use inert diluent with live seed to precisely deliver low seeding rates; heat killed bin-run seed or inert fill will work as diluents.**

Weather affected the 1991/1992 and 1992/1993 experiments, and probably is the cause of a seeding rate response one year and not the next. The weather for the 1991/1992 experiment was warm early and became hot and dry later in the season, but the 1992/1993 conditions were cool and moist with a very long growing season. These differences in weather may account for the different responses to seeding rates between years.

In 1994, winter rapeseed seeding rates of 2, 4, 6, 8, 10, and 12 lb/a were evaluated in a replicated on-farm trial using Dwarf Essex in 500 ft long strips. This trial, near Genesee, Idaho, was conducted using farm scale equipment that should closely approximate grower conditions. Spring plant stands ranged from 146,000 plants/a to 439,000 plants/a for the lowest and highest seeding rates, respectively (Table 3). Of the sown seed, 8 0 percent established plants with the 2 lb/a seeding rate, while other seeding rates ranged from 40 percent to 52% establishment rate. The yield from the 2 lb/a seeding rate was almost 350 lb/a (15%) higher than the 10 lb/a rate. Yield increased progressively as seeding rate decreased. The weather conditions of 1994 were similar to 1992, but not as warm early in the year. Weed control was not a problem in any of the seeding rates of the trial, and no herbicide was used. Oil yield and erucic acid content were not affected by seeding rate.

Results from these seeding rate trials indicate that lowering seeding rates of winter rapeseed (Dwarf Essex) will not reduce yield and, under the conditions in

Fig. 1. Winter Rapeseed Seeding Rate Response in Two Seeding Dates at Moscow, ID, 1992



some of these trials, can increase yield. This assumes that a grower can successfully establish a crop and that the seed can be delivered accurately and uniformly at low rates. The method of variable seeding used in the on-farm trial can be adapted by growers to achieve low seeding rates. In that trial, live seed was diluted with heat-killed seed in the proper ratios to get the specified rates of live seed when the drill was set to deliver 12 lb/a. For that trial. 2 units of dead seed were mixed with 1 unit of live seed to give a 4 lb/a live seeding rate. Growers could use bin-run seed for dead seed diluent at minimal cost. Diluting live seed allows the drill to operate at a functional, accurate setting, while achieving a low seeding rate. However, complete mixing of live seeds and diluent material is necessary before placement in the drill. A cement mixer works well for this. Remember to use crop seed that is clean and weed-free.

Reduced seeding rates can enhance crop productivity, do not reduce crop quality, and should lower seeding cost for growers. Seed costs for rapeseed are expected to rise as more proprietary varieties become available. If growers can reduce seeding rates by 50 to 75%, those savings should be substantial. The 1990 publication EB715, *Dryland Winter Rapeseed Production Guide* indicates 4 lb/a is the minimum seeding rate, but this new information supports advantages to even lower rates, and that higher rates for adverse conditions, such as late seeding or high weed potential, should be 6 to 8 lb/a not the up to 12 lb/a of seed as previously published. As new winter rapeseed varieties become available, they should be evaluated for optimum planting rates, especially if they have the potential for later seeding in the fall.

Table 3. Winter Rapeseed Seeding Rate Response at Genesee, Idaho, 1994.

| Seeding rate lb/a | Seed yield lb/a | Plant stand 1000/a | Seed established† % |
|---|---|---|---|
| 2 | 2611 | 146 | 81 |
| 4 | 2469 | 184 | 52 |
| 6 | 2432 | 276 | 51 |
| 8 | 2440 | 351 | 48 |
| 10 | 2265 | 406 | 45 |
| 12 | 2316 | 439 | 40 |
| $LSD^{0.05*}$ | 177 | 55 | 9 |

* Values differing by more than the LSD are significantly different at the 5% level; n.s. indicates no difference among values.
† The percentage of plants established from planted seed.

## The Authors

Stephen O. Guy is an assistant Extension professor and crop management specialist. Mary Moore is an Extension associate. Both are in the University of Idaho College of Agriculture's Department of Plant, Soil and Entomological Sciences in Moscow.

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, LeRoy D. Luft, Director of Cooperative Extension System, University of Idaho, Moscow, Idaho 83844.


1,500 6-95 Printed on recycled paper by Ag Communications Center $1.00