

XV CANOPY MANIPULATION TRIAL

Objective: To compare the effects of various seeding dates and rates on yield, maturity and disease on *B. napus* canola.

Background: European research (Scott et al, 1999) indicates that canola yields can be related to canopy structure after flowering. Thinner canopies allow more light to penetrate to lower pods resulting in increased yield due to translocation of photosynthetic light from pod hulls. Also, excessive vegetative growth can deplete soil moisture in dry conditions resulting in poor pod formation and filling.

Seeding rate studies have been carried out throughout western Canada under various weed and disease pressures. The introduction of genetically enhanced canola varieties has improved weed control, which lessens the need for higher plant populations. Weather conditions often contribute to increased lodging and sclerotinia. Reducing plant stands may lessen the risk of these factors. However, lower plant densities bring higher risks due to later maturity, green seed and insects (ex. root maggots).

Recent seeding date research indicated that early spring or fall dormant seeded canola has thinner and shorter plant stands, which has been related to increased yields.

Methodology: The canopy manipulation trial consisted of a combination of two seeding dates and three seeding rates using the variety InVigor 2153.

- A) Early seeding date @ 1.0 lb/ac ** (Peace ~ 2.0 lb/ac)
- B) Early seeding date @ 1.0 lb/ac ** (Peace ~ 2.0 lb/ac) @ SCC whole plant (optional)
- C) Early seeding date @ 3.0 lb/ac ** (Peace ~ 5.0 lb/ac)
- D) Early seeding date @ 5.0 lb/ac ** (Peace ~ 8.0 lb/ac)
- E) Normal seeding date @ 1.0 lb/ac ** (Peace ~ 2.0 lb/ac)
- F) Normal seeding date @ 1.0 lb/ac ** (Peace ~ 2.0 lb/ac) @ SCC on whole plant (optional)
- G) Normal seeding date @ 3.0 lb/ac ** (Peace ~ 5.0 lb/ac)
- H) Normal seeding date @ 5.0 lb/ac ** (Peace ~ 8.0 lb/ac) (Check)

Weeds were removed at the recommended leaf stage with an application of Liberty and/or Select. No fungicides were applied in order to allow the assessment of sclerotinia infection levels within each treatment.

Swathing commenced when the main stem was at 30 to 40 % seed colour change (SCC) unless the seed in the pods of the side branches were translucent and soft. In this case, swathing was delayed until the seeds in the side branches were firm.

Western Canadian Summary:

| CPC Location | Selkirk MB | | Naicam SK | | N. Battleford SK | | Beiseker AB | | Lethbridge (Irr) AB | | Rolla BC | |
|----------------------------------|------------|-----|-----------|-----|------------------|-----|-------------|-----|---------------------|-----|----------|-----|
| | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD |
| CANOPY MANIPULATION TRIAL | | | | | | | | | | | | |
| Early seeding at 1lb/ac | - | - | 22.0 | 43 | 19.3 | 28 | - | - | 22.1 | 4 | - | - |
| Early seeding at 3lb/ac | - | - | 29.9 | 89 | 23.4 | 48 | - | - | 25.3 | 19 | - | - |
| Early seeding at 5lb/ac | - | - | 29.2 | 76 | 23.5 | 41 | - | - | 27.5 | 26 | - | - |
| Normal seeding at 1lb/ac | 25.7 | 88 | 24.3 | 59 | 19.8 | 32 | 25.3 | 62 | 21.1 | (2) | - | - |
| Normal seeding at 3lb/ac | 27.4 | 92 | 30.8 | 95 | 24.6 | 56 | 20.8 | 25 | 31.2 | 59 | - | - |
| Normal seeding at 5lb/ac | 25.7 | 73 | 26.9 | 61 | 24.5 | 48 | 19.3 | 9 | 30.3 | 42 | - | - |
| Late seeding at 1lb/ac | 31.8 | 121 | - | - | - | - | - | - | - | - | - | - |
| Late seeding at 3lb/ac | 32.9 | 129 | - | - | - | - | - | - | - | - | - | - |
| Late seeding at 5lb/ac | 32.3 | 117 | - | - | - | - | - | - | - | - | - | - |
| Normal seeding at 2lb/ac | - | - | - | - | - | - | - | - | - | - | 49.1 | 221 |
| Normal seeding at 5lb/ac | - | - | - | - | - | - | - | - | - | - | 47.2 | 199 |
| Normal seeding at 8lb/ac | - | - | - | - | - | - | - | - | - | - | 47.2 | 190 |
| Late seeding at 2lb/ac | - | - | - | - | - | - | - | - | - | - | 49.7 | 225 |
| Late seeding at 5lb/ac | - | - | - | - | - | - | - | - | - | - | 48.7 | 209 |
| Late seeding at 8lb/ac | - | - | - | - | - | - | - | - | - | - | 50.1 | 209 |

Note: NYD - Net Yield Data (bu/ac), CMD - Contribution Margin Data (\$/ac)

(-) Indicates treatment not conducted.

Brackets in the CMD reflect a negative value.

SELKIRK

Methodology:

Early seeding was not possible due to wet conditions, so a late seeding date was substituted. The seeding dates were normal (May 22) and late (May 31). All treatments received a 1.35 L/ac application of Liberty at about the 2 to 3-leaf stage.

Observations:

Emergence was excellent due to warm, moist soil conditions. As a result, stand establishment in all treatments was greater than expected. Weed control was very good following the Liberty application, and no sequential applications were required. Warm and moist conditions hastened crop development, but were ideal for sclerotinia development. Disease incidence was less severe at the late seeding date due to drier conditions which prevailed in August and September. Disease incidence appeared to be unaffected by seeding rate. The percentage of plants infected was 55, 50 and 51 % for the 1, 3 and 5 lb/ac normal treatments, respectively. For the late treatments, the levels were 22, 20 and 15 % for the 1, 3 and 5 lb/ac rates.

Results: (a) Plant stand measurements

| CANOPY MANIPULATION Selkirk, MB | | | | | | |
|--|--|--|----------------------------------|----------------------------------|-----------------------------------|-------------------------------------|
| System | Emergence Counts (plants/m²) | Harvest Counts (plants/m²) | Plant Height (cm) | Lodging Ratio (%) | # Primary Branches | # Secondary Branches |
| Normal Seeding Date | | | | | | |
| 1 lb/ac | 37 | 33 | 148 | 71 | 5 | 4 |
| 3 lb/ac | 82 | 42 | 141 | 66 | 3 | 1 |
| 5 lb/ac | 141 | 77 | 131 | 60 | 2 | 0 |
| Late Seeding Date | | | | | | |
| 1 lb/ac | 43 | 34 | 139 | 65 | 5 | 4 |
| 3 lb/ac | 92 | 52 | 135 | 57 | 3 | 1 |
| 5 lb/ac | 149 | 81 | 125 | 57 | 2 | 1 |
| LSD | 23.5 | 17.7 | 11.6 | 8.3 | 0.9 | 1.8 |
| CV% | 20.6 | 28.4 | 4.5 | 10.8 | 15.5 | 51.8 |

Results: (b) Yield and quality data

| CANOPY MANIPULATION Selkirk, MB | | | | | | | | |
|--|----------------------|--------------------------|--|--------------------|---|------------------------------------|---------------------------------|--------------|
| System | Yield (%) | Yield (bu/ac) | Contribution Margin (\$/ac) | Oil (%) | 1000 Kernel Weight (g) | Growing Degree Days | Days To Maturity | Grade |
| Normal Seeding Date | | | | | | | | |
| 1 lb/ac | 100 | 25.7 | 88.28 | 40.7 | 3.8 | 1077 | 84 | 1 |
| 3 lb/ac | 107 | 27.4 | 91.95 | 41.6 | 4.2 | 1052 | 82 | 1 |
| 5 lb/ac | 100 | 25.7 | 72.68 | 41.9 | 4.3 | 1052 | 82 | 1 |
| Late Seeding Date | | | | | | | | |
| 1 lb/ac | 124 | 31.8 | 120.87 | 43.3 | 4.4 | 1078 | 81 | 2 |
| 3 lb/ac | 128 | 32.9 | 129.08 | 43.8 | 4.7 | 1078 | 81 | 1 |
| 5 lb/ac | 126 | 32.3 | 117.23 | 43.7 | 5.0 | 1061 | 80 | 1 |
| LSD | | 2.79 | | 1.43 | 0.86 | | | |
| CV% | | 3.7 | | 2.6 | 15.8 | | | |

Results: (c) Swath staging comparison data

| CANOPY MANIPULATION Selkirk, MB | | | | | | | | |
|------------------------------------|-----------|---------------|-----------------------------|---------|------------------------|---------------------|------------------|-------|
| System | Yield (%) | Yield (bu/ac) | Contribution Margin (\$/ac) | Oil (%) | 1000 Kernel Weight (g) | Growing Degree Days | Days To Swathing | Grade |
| Swath Staging Comparison | | | | | | | | |
| 1lb/ac @ 30-40% | 100 | 31.8 | 120.87 | 43.3 | 4.4 | 1078 | 81 | 2 |
| 1lb/ac firm seed in side branches | 105 | 33.5 | 131.88 | 44.0 | 4.4 | 1097 | 82 | 1 |
| LSD | | 2.79 | | 1.43 | 0.86 | | | |
| CV% | | 3.7 | | 2.6 | 15.8 | | | |

Discussion:

Plant counts increased with increased seeding rate, but were unaffected by seeding date. Lodging ratio, plant height and the number of primary and secondary branches all decreased as seeding rate increased, for both planting dates. Planting date had no effect on these factors.

The lower sclerotinia incidence in the late seeding date translated into significantly higher yields and economic returns. Seeding rate had no clear impact on yield. It appeared that the excellent emergence in the lower seeding rates combined with good growing conditions allowed the plants in those treatments to compensate well. Oil content was unaffected by seeding rate but was reduced in the normal planting date, probably due to stress from sclerotinia. Kernel weight also tended to be lower for the normal planting date. Hotter and drier weather in the latter part of the season appeared to ripen the late seeding date treatments quicker, and minimized the impact of the lower plant densities on maturity. Contribution margins reflected differences in yield, seed cost and grade.

With respect to the swath staging comparison, a one day delay in swathing resulted in an 11 % increase in seed colour change on the main stem. Some colour change was noted on lower pods on the primary branches. The delay in swathing improved yield, though not significantly. Contribution margin reflected this small increase and an improvement in grade. There was no impact on oil content or kernel weight.

NAICAM

Methodology:

This trial was seeded May 4 and 15. The variety InVigor 2153 was seeded at 1.0, 3.0 and 5.0 lb/ac. Corn cob grit was used as a seed bulking agent to better regulate the 1.0 lb/ac and 3.0 lb/ac seeding rates. Seeding rates were then calculated on a 5.0 lb/ac total product basis. A fertilizer blend of 7-20-10-5 (actual) was seed-placed for all treatments. All treatments were sprayed with a tank mix of Liberty (1.35 L/ac or 10 ac/jug) and Select (0.025 L/ac or 120 ac/case).

Observations:

Environmental conditions delayed emergence of the early seeding date treatments (May 22). Normal seeding date treatments emerged in only 7 days. Plant densities were proportional to seeding rates. Flea beetle damage was more severe in the 1.0 lb/ac seeding rate for both seeding dates. This was due to lower plant densities than the other treatments. All treatments were sprayed at the 2 to 3-leaf stage of the crop. Weed control was good, but there were late flushes of weeds in the lower seeding rates due to reduced crop competition. The level of sclerotinia stem rot infection did not vary between seeding rates or seeding dates.

Results: (a) Plant stand measurements

| CANOPY MANIPULATION Naicam, SK | | | | | | |
|-----------------------------------|---|---|-------------------|-------------------|--------------------|----------------------|
| Treatment | Emergence Counts (plants/m ²) | Harvest Counts (plants/m ²) | Plant Height (cm) | Lodging Ratio (%) | # Primary Branches | # Secondary Branches |
| Early Seeding Date | | | | | | |
| 1 lb/ac | 20 | 23 | 99 | 93 | 5 | 5 |
| 3 lb/ac | 59 | 61 | 105 | 94 | 3 | 3 |
| 5 lb/ac | 98 | 96 | 112 | 95 | 3 | 3 |
| Normal Seeding Date | | | | | | |
| 1 lb/ac | 21 | 23 | 92 | 95 | 5 | 5 |
| 3 lb/ac | 66 | 64 | 100 | 96 | 3 | 3 |
| 5 lb/ac (check) | 104 | 100 | 109 | 96 | 2 | 2 |

Results: (b) Yield and quality data

| CANOPY MANIPULATION | | | | | | | | |
|----------------------------|------------------|----------------------|------------------------------------|----------------|-------------------------------|----------------------------|-------------------------|--------------|
| Naicam, SK | | | | | | | | |
| Treatment | Yield (%) | Yield (bu/ac) | Contribution Margin (\$/ac) | Oil (%) | 1000 Kernel Weight (g) | Growing Degree Days | Days To Maturity | Grade |
| Early Seeding Date | | | | | | | | |
| 1 lb/ac | 82 | 22.0 | 43.17 | 39.4 | 3.1 | 1077 | 103 | 1 |
| 3 lb/ac | 111 | 29.9 | 88.70 | 41.3 | 3.7 | 1055 | 101 | 1 |
| 5 lb/ac | 110 | 29.2 | 76.17 | 42.5 | 3.3 | 1055 | 101 | 1 |
| Normal Seeding Date | | | | | | | | |
| 1 lb/ac | 90 | 24.3 | 58.70 | 40.4 | 3.5 | 1092 | 104 | 1 |
| 3 lb/ac | 114 | 30.8 | 94.77 | 41.9 | 3.7 | 1055 | 101 | 1 |
| 5 lb/ac (check) | 100 | 26.9 | 60.65 | 42.2 | 3.3 | 1055 | 101 | 1 |
| LSD | | 3.05 | | 2.13 | | | | |
| CV% | | 3.4 | | 2.1 | | | | |

Discussion: Lodging ratios, maturity and branching tended to increase as seeding rates were lowered, whereas plant height decreased, regardless of seeding date. There was no significant difference in yield between the 3 and 5 lb/ac seeding rates in either seeding date. However, the 3.0 lb/ac seeding rate yielded significantly higher compared to the 1.0 lb/ac seeding rate for both seeding dates. This yield increase is reflected in contribution margins. Seeding rate also factors into the level of profitability. There were significant differences in oil content between seeding rates in the early seeding date treatments.

NORTH BATTLEFORD

Methodology: The early seeding date treatments for this trial were seeded on May 3. The normal seeding date treatments were seeded on May 10. The drill was calibrated to seed 5 lb/ac. Corn cob grit was used to bulk up the 1 and 3 lb/ac treatments to equal 5 lb/ac. The trial was sprayed with Liberty (1.35 L/ac or 10 ac/jug) and Select (120 ac/case) on June 5. Swathing of each treatment began when all seeds on the side branches of the plants were firm.

Observations: Emergence was slow for all treatments. However, a uniform plant stand developed that was proportional to the respective seeding rates. Initial weed control was good for all treatments. However, there were late germinating weeds in the 1 lb/ac seeding rates. Canola plants in the 1 lb/ac treatments appeared to withstand the heat during flowering better than the other treatments. Flowers in the 3 lb/ac and 5 lb/ac treatments turned pale orange in colour indicating signs of heat stress. Flowers in

the 1 lb/ac treatment remained yellow in colour. Plants in the 1 lb/ac seeding rate treatments became very large and lodging problems developed. Plants in the 3 lb/ac and 5 lb/ac seeding rate treatments did not lodge. Swathing was most difficult in the 1 lb/ac seeding rate treatments.

Results: (a) Plant stand measurements

| CANOPY MANIPULATION North Battleford, SK | | | | | | |
|---|--|--|------------------------------|------------------------------|---------------------------|-----------------------------|
| System | Emergence Counts (plants/m²) | Harvest Counts (plants/m²) | Plant Height (cm) | Lodging Ratio (%) | # Primary Branches | # Secondary Branches |
| Early Seeding Date | | | | | | |
| 1 lb/ac | 6 | 6 | 80 | 76 | 9 | 18 |
| 3 lb/ac | 22 | 22 | 80 | 89 | 4 | 9 |
| 5 lb/ac | 42 | 47 | 86 | 90 | 5 | 3 |
| Normal Seeding Date | | | | | | |
| 1 lb/ac | 6 | 10 | 92 | 72 | 9 | 19 |
| 3 lb/ac | 28 | 34 | 96 | 87 | 5 | 8 |
| 5 lb/ac (check) | 50 | 47 | 96 | 90 | 5 | 4 |

Results: (b) Yield and quality data

| CANOPY MANIPULATION North Battleford, SK | | | | | | | | |
|---|------------------|----------------------|------------------------------------|----------------|-------------------------------|----------------------------|-------------------------|--------------|
| System | Yield (%) | Yield (bu/ac) | Contribution Margin (\$/ac) | Oil (%) | 1000 Kernel Weight (g) | Growing Degree Days | Days To Maturity | Grade |
| Early Seeding Date | | | | | | | | |
| 1 lb/ac | 79 | 19.3 | 28.29 | 42.6 | 4.5 | 1041 | 103 | 1 |
| 3 lb/ac | 96 | 23.4 | 48.17 | 43.5 | 4.3 | 988 | 98 | 1 |
| 5 lb/ac | 96 | 23.5 | 41.04 | 43.7 | 4.4 | 973 | 97 | 1 |
| Normal Seeding Date | | | | | | | | |
| 1 lb/ac | 81 | 19.8 | 31.67 | 41.6 | 4.7 | 1036 | 97 | 1 |
| 3 lb/ac | 100 | 24.6 | 56.27 | 43.8 | 4.6 | 1008 | 95 | 1 |
| 5 lb/ac (check) | 100 | 24.5 | 47.79 | 43.1 | 4.7 | 985 | 93 | 1 |
| LSD | | 1.66 | | 0.56 | 0.53 | | | |
| CV% | | 5.9 | | 1.0 | 9.3 | | | |

Discussion:

Seeding at 1 lb/ac for both seeding dates produced the lowest yield. There were no significant differences in yield among the other treatments. The 3 lb/ac and 5 lb/ac seeding rate treatments produced higher oil content than seeding at 1 lb/ac. There were no significant

differences in kernel weight among the treatments. All treatments graded #1. Differences in contribution margins reflect differences in yield and seed costs.

BEISEKER

Methodology: This trial was seeded on May 14. Corn cob grit was used as a bulking agent to achieve the lower seeding rates.

Observations: Emergence across all treatments was rapid. Drought stress was less apparent as seeding rates were lowered. Weed control was good for all treatments. The more open canopy in the 1 lb/ac treatment allowed new weeds to emerge and compete against the crop. Days to maturity lengthened as seeding rates were reduced. No sclerotinia was found in this trial.

Results: (a) Plant stand measurements

| CANOPY MANIPULATION Beiseker, AB | | | | | |
|---|--|--|-----------------------------------|-------------------------------------|------------------------------------|
| System | Emergence Counts (plants/m²) | Harvest Counts (plants/m²) | # Primary Branches | # Secondary Branches | # Tertiary Branches |
| Normal Seeding Date | | | | | |
| 1 lb/ac | 18 | 17 | 8 | 8 | 1 |
| 3 lb/ac | 49 | 46 | 5 | 5 | 0 |
| 5 lb/ac (check) | 79 | 78 | 4 | 4 | 0 |

Results: (b) Plant stand measurements

| CANOPY MANIPULATION Beiseker, AB | | | |
|---|------------------------------|------------------------------|---|
| System | Plant Height (cm) | Lodging Ratio (%) | Seed Colour Change on Main stem to achieve 35 % seed colour of whole plant |
| Normal Seeding Date | | | |
| 1 lb/ac | 76 | 91 | 55 |
| 3 lb/ac | 78 | 95 | 45 |
| 5 lb/ac (check) | 81 | 95 | 35 |

Results: (c) Yield and quality data

| CANOPY MANIPULATION Beiseker, AB | | | | | | | |
|---|------------------|----------------------|------------------------------------|----------------|-------------------------------|----------------------------|-------------------------|
| System | Yield (%) | Yield (bu/ac) | Contribution Margin (\$/ac) | Oil (%) | 1000 Kernel Weight (g) | Growing Degree Days | Days To Maturity |
| Normal Seeding Date | | | | | | | |
| 1 lb/ac | 131 | 25.3 | 61.78 | 39.4 | 4.4 | 1270 | 102 |
| 3 lb/ac | 108 | 20.8 | 25.17 | 37.5 | 4.1 | 1185 | 96 |
| 5 lb/ac (check) | 100 | 19.3 | 8.80 | 38.6 | 4.6 | 1185 | 96 |
| LSD | | 2.55 | | 1.55 | 1.07 | | |
| CV% | | 8.5 | | 2.9 | 17.9 | | |

Discussion: The 1 lb/ac treatment yielded significantly higher than the 3 and 5 lb/ac treatments, and also had the highest oil content. For this year, the 1 lb/ac seeding rate treatment had the highest contribution margin.

Maturity and branching increased as seeding rate declined. To achieve an overall plant seed colour change of 35 %, swathing had to be delayed. As seeding rates increased, plants were taller and less lodged. Due to dry conditions experienced at this site, the lower seeding rates benefited from less inter-plant competition.

LETHBRIDGE (IRRIGATION)

Methodology: The trial was seeded May 3 and 10. To achieve lower seeding rates, corn cob grit was used. All treatments were sprayed with a Liberty and Select tank mix (See *Site Information*).

Observations: Emergence within all treatments was uniform. The early seeded portion of the trial emerged rapidly taking advantage of available soil moisture. The normal seeded portion of the trial did not emerge until after irrigation water was applied. Cabbage seedpod weevils were above threshold levels, and were sprayed when the crop was at 10 % bloom (see *Cabbage Seedpod Weevil Trial*). Plant heights were shorter than expected. Flower blast was observed in all treatments.

Results: (a) Plant measurements

| CANOPY MANIPULATION Lethbridge, AB (Irrigation) | | | | | |
|--|--|--|-----------------------------------|-------------------------------------|------------------------------------|
| System | Emergence Counts (plants/m²) | Harvest Counts (plants/m²) | # Primary Branches | # Secondary Branches | # Tertiary Branches |
| Early Seeding Date | | | | | |
| 1 lb/ac | 17 | 17 | 7 | 9 | 1 |
| 3 lb/ac | 39 | 39 | 5 | 5 | 0 |
| 5 lb/ac | 104 | 104 | 4 | 1 | 0 |
| Normal Seeding Date | | | | | |
| 1 lb/ac | 27 | 27 | 7 | 9 | 1 |
| 3 lb/ac | 59 | 59 | 5 | 3 | 0 |
| 5 lb/ac (check) | 147 | 147 | 4 | 1 | 0 |
| LSD | | | 0.5 | 1.5 | 0.3 |
| CV% | | | 7.9 | 26.7 | 121.5 |

Results: (b) Plant measurements

| CANOPY MANIPULATION Lethbridge, AB (Irrigation) | | | | | |
|--|----------------------------------|----------------------------------|--|-------------------|----------------------------|
| System | Plant Height (cm) | Lodging Ratio (%) | Seed Colour Change on Main stem to achieve 35% seed colour of whole plant | Pods/Plant | Pods/ft² |
| Early Seeding Date | | | | | |
| 1 lb/ac | 97 | 70 | 70 | 172 | 292 |
| 3 lb/ac | 94 | 83 | 50 | 105 | 410 |
| 5 lb/ac | 91 | 83 | 30 | 58 | 603 |
| Normal Seeding Date | | | | | |
| 1 lb/ac | 99 | 77 | 60 | 153 | 413 |
| 3 lb/ac | 92 | 84 | 40 | 81 | 513 |
| 5 lb/ac (check) | 91 | 82 | 30 | 53 | 779 |
| LSD | | | | 18.9 | |
| CV% | | | | 15.5 | |

Results: (c) Yield and quality data

| CANOPY MANIPULATION Lethbridge, AB (Irrigation) | | | | | | | | |
|--|------------------|----------------------|------------------------------------|----------------|-------------------------------|----------------------------|-------------------------|--------------|
| System | Yield (%) | Yield (bu/ac) | Contribution Margin (\$/ac) | Oil (%) | 1000 Kernel Weight (g) | Growing Degree Days | Days To Maturity | Grade |
| Early Seeding Date | | | | | | | | |
| 1 lb/ac | 73 | 22.1 | 4.48 | 42.3 | 4.4 | 1136 | 108 | 1 |
| 3 lb/ac | 83 | 25.3 | 19.46 | 42.7 | 4.3 | 1065 | 102 | 1 |
| 5 lb/ac | 91 | 27.5 | 25.73 | 42.6 | 4.3 | 1009 | 97 | 1 |
| Normal Seeding Date | | | | | | | | |
| 1 lb/ac | 70 | 21.1 | (1.88) | 42.3 | 3.8 | 1079 | 99 | 1 |
| 3 lb/ac | 103 | 31.2 | 59.28 | 43.3 | 3.8 | 1023 | 95 | 1 |
| 5 lb/ac (check) | 100 | 30.3 | 41.80 | 43.4 | 4.0 | 1009 | 94 | 1 |
| LSD | | 3.98 | | 0.82 | 0.70 | | | |
| CV% | | 12.7 | | 1.6 | 14.5 | | | |

Note: Brackets in the contribution margin reflect a negative value.

Discussion:

Yields differing by 3.98 bu/ac or more were significant. The 3 lb/ac normal seeded treatment had the highest yield and contribution margin. Emergence was greater at the normal seeding date for each seeding rate. Increased seeding rates produced shorter plants and less lodging. The 1 lb/ac seeding rate had the longest days to maturity at 108 days. To achieve overall plant seed colour change of 35 %, swathing had to be delayed as seeding rates decreased. Branching and pods per plant increased as seeding rates declined. The number of pods per square foot was highest at the 5 lb/ac normal seeding date.

ROLLA

Methodology:

The normal seeding date treatments were seeded on May 9 and the late seeding date treatments were seeded on May 24. Three different seeding rates were used: 2 lb/ac, 5 lb/ac and 8 lb/ac. A fertilizer blend was seed-placed. Due to the low weed pressure, the trial was not sprayed with a herbicide. However, it was sprayed with Decis 5EC (60 mL/ac) to control diamondback moth larvae.

Observations:

Adequate rainfall occurred throughout the growing season. There were no apparent maturity differences among the seeding rates at each seeding date. Each treatment was swathed at 40 % seed colour change on the main stem. There were no apparent differences in swathing each treatment.

Results: (a) Plant stand measurements

| CANOPY MANIPULATION | | | | | |
|----------------------------|--|--------------------------|--------------------------|---------------------------|-----------------------------|
| Rolla, BC | | | | | |
| System | Harvest Counts (plants/m²) | Plant Height (cm) | Lodging Ratio (%) | # Primary Branches | # Secondary Branches |
| Normal Seeding Date | | | | | |
| 2 lb/ac | 52 | 120 | 72 | 3 | 1 |
| 5 lb/ac | 104 | 119 | 74 | 3 | 0 |
| 8 lb/ac (check) | 136 | 119 | 68 | 3 | 1 |
| Late Seeding Date | | | | | |
| 2 lb/ac | 48 | 122 | 69 | 4 | 1 |
| 5 lb/ac | 100 | 115 | 80 | 2 | 1 |
| 8 lb/ac | 128 | 116 | 69 | 3 | 0 |

Results: (b) Yield and Quality Data

| CANOPY MANIPULATION | | | | | | | | |
|----------------------------|------------------|----------------------|------------------------------------|----------------|-------------------------------|----------------------------|-------------------------|--------------|
| Rolla, BC | | | | | | | | |
| System | Yield (%) | Yield (bu/ac) | Contribution Margin (\$/ac) | Oil (%) | 1000 Kernel Weight (g) | Growing Degree Days | Days To Maturity | Grade |
| Normal Seeding Date | | | | | | | | |
| 2 lb/ac | 104 | 49.1 | 221.31 | 43.6 | 4.4 | 947 | 112 | 1 |
| 5 lb/ac | 100 | 47.2 | 198.97 | 43.7 | 4.8 | 947 | 112 | 1 |
| 8 lb/ac (check) | 100 | 47.2 | 189.45 | 43.8 | 5.0 | 947 | 112 | 1 |
| Late Seeding Date | | | | | | | | |
| 2 lb/ac | 105 | 49.7 | 225.36 | 44.2 | 4.2 | 981 | 118 | 1 |
| 5 lb/ac | 103 | 48.7 | 209.09 | 44.4 | 4.9 | 981 | 118 | 1 |
| 8 lb/ac | 106 | 50.1 | 209.03 | 44.7 | 4.5 | 947 | 118 | 1 |
| LSD | | 1.53 | | 0.64 | 0.48 | | | |
| CV% | | 2.6 | | 1.2 | 8.2 | | | |

Discussion:

Yield differences of 1.53 bu/ac or greater are significant. Oil content differences of 0.64 % or greater are also significant. The oil content of the late seeded 8 lb/ac treatments was significantly higher than the check. Contribution margins are a function of yield and seed costs. Every treatment had a higher contribution margin than the check.

Lodging was slightly reduced at the 5 lb/ac seeding rate at either time of seeding. Both primary and secondary branching tended to decrease as the seeding rate increased. Days to maturity were the same among the different seeding rates. Although the normal and late seeding dates were two weeks apart, maturity only differed by six days.