Evaluating Yield Potentials through Seeding Dates in Yellow and Oriental Mustard

Precipitation and high summer temperatures are two of the main limiting factors in the Canadian Prairies. Mustard is considered to be a crop that is more tolerant to heat stress than other oilseeds, but there is still a yield loss when temperatures are too high during critical points in the plants life (flowering). Often, mustard is grown and seeded later within the season, but it is now known that planting earlier may result in yield benefits. Many studies have been conducted to show that mustard is more frost tolerant than other seeds, and can germinate in soils that are 4°C. It is therefore a good candidate to be seeded early in the spring. Mustard has also been shown to thrive with the early spring moisture, as well as the earlier the flowering the less chance there is heat stress.

This project looked at various seeding dates to determine which timing will result in the greatest yield benefits. We are looking at getting a better, more exact, recommendation for growers in the West Central area. The varieties chosen were a yellow mustard, and an oriental mustard, as they are most commonly grown in West Central Saskatchewan. The demonstration was arranged as a randomized complete block design with four replicates at Scott 2017. The treatments consisted of two varieties (yellow and oriental mustard) and six seeding dates, spaced approximately 10 days apart. Actual seeding dates started early May rather than late April due to late frost, snowfall and excessive moisture. The plots were direct-seeded into wheat stubble using an R-Tech plot drill on ten-inch row spacing. Weeds and diseases where be controlled using registered herbicide and foliar fungicide applications. Soil temperature and soil moisture were collected at time of seeding.

Early planting may increase the likelihood of utilizing early spring moisture, however, decreased plant stands typically occur due to strained environmental conditions. Timing of seeding played a crucial role in oriental mustard (TKW 2.8 g) emergence (P=<0.0001) (Table 3). Early, mid, and late seeding in May resulted in a 51%, 19%, and 26% stand reduction of oriental mustard compared to plant densities seeded in June, respectively (Figure 1). On average, plant densities of oriental mustard increased linearly by 32% with delayed seeding into June. Plant densities of yellow mustard (AC Pennant) at both seeding date intervals (May vs. June) exhibited a trend relating to seeding date, however, a significant linear increase was not detected. Plant densities tended to remain consistent after the earliest May seeding date with an average plant density increase of 21% (Figure 1).

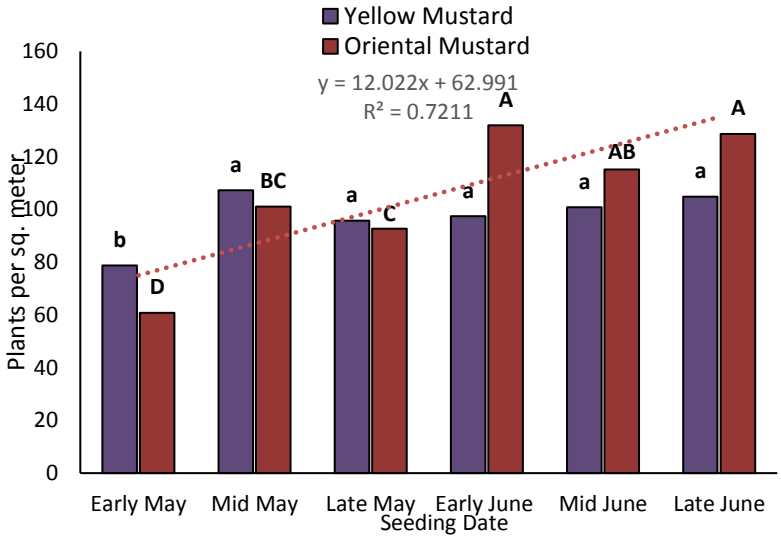

Figure 1. Seeding from early, mid, late- May to early, mid, late-June of oriental mustard (Cutlass) resulted in a significant linear (P=0.0353) increase in plant density at Scott, 2017. Timing of seeding did significantly (P=0.0162) improved plant density of yellow mustard (AC Pennant) when seeded after early may at Scott, 2017. Different letters indicate a significant difference (P < 0.05).

The results of this study have provided insights to seeding date recommendations for yellow and oriental mustard by demonstrating the effect of timing of seeding on mustard yield and seed size. For both mustard classes, seeding in May was beneficial as it allowed for utilization of soil moisture and avoidance of flowering during high temperatures. Yellow mustard was less affected by early seeding compared to oriental mustard, however, both exhibited a severe yield decline when seeding was delayed until June. The implications of this study coincide with current recommendations in which mustard should be seeded in early to mid-May in order to maximize yields, regardless of reduced plant populations. Delayed seeding resulted in both yellow and oriental mustard in shorter days to maturity (DTM) by 9 and 15 days, respectively. A shortened DTM reduced the days required for greater seed production and seed size. Although DTM was shortened, the length of time to reach harvest maturity declined, resulting a greater risk of frost of delayed seeded mustard. Overall, this demonstration indicates to producers that seeding dates plays a very large role in yield and should be considered when planting.

Full report at:

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