

ADOPT

Agricultural Demonstration of Practices and Technologies

Final Report – November 13, 2012

ADOPT Project #20110369

Optimal seeding rate for spring wheat

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Objectives:

The objective of this demonstration is to provide information on the yield benefits associated with increasing seeding rate in wheat.

Rationale:

Producers may see a benefit of increasing the seeding rate of spring wheat above the typically recommended seeding rates when targeting higher wheat yields. Higher seeding rates may help to optimize yield when seeding newer varieties with higher yield potential. Generally, a more dense plant stand allows the crop to compete better with weeds. When planted at a higher density, the developing crop plants can cover the ground quickly and shade out weeds. Previous research has shown that wheat yields can be increased by increasing seeding rates; however, there is a point when the benefits of an increased plant population do not outweigh the costs of additional seed. When seed costs are high this will be especially evident. This project will demonstrate to local producers the potential yield benefits that can be achieved by increasing plant populations as well as when the maximum economic benefit is reached.

Materials and Methods:

The demonstration took place at the Conservation Learning Centre. Unity VB wheat was planted at eight different seeding rates. Seeding rates ranged from lower than the recommended rate to higher than the recommended rate in order to create a response curve. Treatments included wheat seeded at:

- 1) 60 seeds/m²
- 2) 120 seeds/m²
- 3) 180 seeds/m²



- 4) 240 seeds/m²
- 5) 300 seeds/m²
- 6) 360 seeds/m²
- 7) 420 seeds/m²
- 8) 480 seeds/m²

Prior to seeding on May 12th, a litre of glyphosate was used to burn off any existing competition. The wheat was seeded on May 16th with a cone seeder into summer fallow. Soil conditions at the time of seeding were cool and very moist. 60lbs N- 70lbs P- 15lbs S was required and applied. Cool, moist conditions delayed emergence until May 24th, followed by heavy rains causing excessive flooding on this project. This flooding reduced overall emergence and allowed the barnyard grass to establish. A litre of MCPA 500 was applied June 25th with competition already causing a decrease in yield. All treatments did poorly throughout the growing season as a result of flooding and competition. Disease pressure was minimal due to patchy emergence allowing for good airflow. Overall samples were less than desirable with a #3 being the best quality sample.

Results:

Seeding density	Yield	TKW	BSL weight
60 seeds/m ²	15.32bu/ac	31.6 g	56.1 lbs
120 seeds/m ²	17.38 bu/ac	30.2 g	57.8 lbs
180 seeds/m ²	15.42 bu/ac	29.6 g	56 lbs
240 seeds/m ²	28.91 bu/ac	30 g	57.1 lbs
300 seeds/m ²	26.47 bu/ac	30.8 g	56.9 lbs
360 seeds/m ²	40.75 bu/ac	33.2 g	61 lbs
420 seeds/m ²	26.47 bu/ac	21.9 g	57 lbs
480 seeds/m ²	32.74 bu/ac	27.1 g	58.7 lbs

Supporting Information

Acknowledgements:

We would like to express our gratitude to the Ministry of Agriculture for the funding support and in-kind support with this project. To recognize the ADOPT program and the Ministry we had signage at the sites.



Field Days:

- Conservation Learning Centre – Annual Field Day – July 17th - 45 people
- Conservation Learning Centre – Combine Clinic – Aug 9th – 55 produce
- Report on the project to be posted on our website
www.conservationlearningcentre.com

Abstract:

With the plots burnt off with a litre of glyphosate on May 12th, seeding with our cone seeder was complete on the 16th of May into cool, moist conditions. These less than favourable conditions delayed emergence and weakened the stand. Heavy rains also affected this already struggling trial with excessive flooding that reduced all plant stands and allowed for barnyard grass to compete very aggressively which was a large factor in reducing yields. A litre of MCPA 500 was applied June 25th with marginal results. Larger grasses were not controlled allowing them to starve the wheat of its requirements. With a less than desirable stand in all treatments, leaf diseases were minimal with no fungicides applied. All grades harvested on Sept 15th were graded #3 with test weights being quite variable. We achieved a test weight of 61 lbs with the density of 360 seeds/m² and down to 56 lbs with the 60 seeds/m². With excessive moisture early on and severe flooding of this site, correlations with seed density are unachievable.

