

# Agricultural Demonstration of Practices and Technologies (ADOPT)

## **FINAL REPORT**

**20140307**

### **NITROGEN RESPONSE OF FALL RYE VARIETIES**

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# **ADOPT Final Report**

#20140307 Nitrogen Response of Fall Rye Varieties

South East Research Farm

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## **Introduction**

In 2016, the South East Research Farm conducted a demonstration trial evaluating the response of hybrid and conventional fall rye to five nitrogen application rates. The objective of the trial was to determine whether nitrogen rate recommendations should be different for new hybrid rye varieties, since they are generally higher yielding than open pollinated varieties.

## **Materials and Methods**

The rye nitrogen rate trial was seeded on Sept 20, 2015 onto soybean stubble at the South East Research Farm in a Randomized Complete Block Design with plots measuring 10 feet by 30 feet. The trial was seeded with the Seedmaster plot drill with 20 lb/ac actual P and 60 lb/ac of seed. Seed rate was consistent on a weight basis for the two rye varieties: Hazlet and Brasetto.

The nitrogen treatments were applied at the time of seeding by varying the rate of urea applied in a side band. There was a total of 45 lb/ac available soil N based on a soil test taken in April 2016 from untreated plot areas.

Treatments:

1. Hazlet 0 kg/ha N
2. Hazlet 40 kg/ha N
3. Hazlet 80 kg/ha N
4. Hazlet 120 kg/ha N
5. Hazlet 160 kg/ha N
6. Brasetto Hybrid 0 kg/ha N
7. Brasetto Hybrid 40 kg/ha N
8. Brasetto Hybrid 80 kg/ha N
9. Brasetto Hybrid 120 kg/ha N
10. Brasetto Hybrid 160 kg/ha N

The first replicate of the trial was arranged in order of increasing N rate so that treatment differences were visually obvious as a demonstration. The remaining three replicates were randomized within each block. There were no pesticides used on the trial as they were not necessary. The trial was harvested on

Aug. 5, 2016. Yields were adjusted for moisture. The data was analysed as an RCBD using the Statistix program.

**Results:**

The trial established successfully in 2015 and had no observable winterkill in 2016. There were obvious differences in crop color and productivity to fertility treatments, with the untreated control being obviously deficient in nitrogen. There were significant differences in height and yield (Table 1, Table 2).

Table 1. Average crop height at maturity (P<0.05)

	Height	SE
Hazlet 0	102.47	3.3255
Hazlet 40	107.93	3.3282
Hazlet 80	108.85	3.3255
Hazlet 120	103.19	3.1525
Hazlet 160	107.23	3.3303
Hybrid 0	93.69	3.355
Hybrid 40	100.28	3.2295
Hybrid 80	97.75	3.3721
Hybrid 120	94.94	3.355
Hybrid 160	94.38	3.3721
CV	6	

Table 2. Yield (kg/ha) of rye for 10 treatments.

	Yield Bu/ac	Yield Kg/ha	SE
Hazlet 0	55	3431	202.94
Hazlet 40	73	4597	203.11
Hazlet 80	98	6153	202.94
Hazlet 120	98	6190	192.39
Hazlet 160	97	6097	203.24
Hybrid 0	64	4025	204.75
Hybrid 40	104	6531	197.09
Hybrid 80	125	7893	205.79
Hybrid 120	128	8073	204.75
Hybrid 160	128	8041	205.79
CV		6%	

The data was analysed as an RCBD using Statistix. Differences were significant (P<0.005) for both height and grain yield. There were no noticeable differences between blocks for nitrogen effect. The Hazlet rye was taller than the Brasetto hybrid rye. Lodging ratings were taken, but there were no obvious effects in lodging due to treatments.

The 80 kg/ha (77 lb/ac) N rate resulted in close to the maximum yield for both the hybrid rye and the conventional rye. Results suggest that both the hybrid rye and conventional rye responded similarly to added nitrogen fertilizer in this situation. The hybrid rye had a higher overall yield but reached an optimum at the same N level. The difference in crop value (\$4.5/bu) for the hybrid rye vs. the conventional rye at 80 kg/ha N (rate was \$124, which would make the higher cost of hybrid seed worthwhile. At normal nitrogen prices, the cost of nitrogen at the 80 rate is also profitable and economical. There may be a rate between 40 and 80 kg/ha that would be more optimal economically. The rate of 77 lb/ac N is comparable to usual application rates for wheat in the area.

#### **Extension and Demonstration:**

The trial was toured on July 20<sup>th</sup> as part of the SERF Field Day. This event had about 70 participants. Several individual producers visited the site in July also.

#### **Conclusions and Recommendations:**

Hybrid rye yielded over 120 bu/ac at similar N rates to CWRS for the region. The added yield potential easily covers the higher costs of seed. Hybrid rye is a new opportunity for producers in the southeast that is both profitable and agronomically useful in a rotation. The results from this site will be combined with results from other sites from 2015 to make informed recommendations on nitrogen for this new variation on an old crop.

