

## Trial 6. Nutrition for Hyper Yielding Wheat

**Objectives:** To assess the value of higher nutrition input (N, P, K & S) for wheat in the growing season and as an “N bank” for the following season (cv RGT Accroc).

Individual objectives specific to the trials were:

- To assess the value of additional nutrients in the growing crop (set up as small plots at the Research Centre) and for the following crop (mirror image trial set up in host farmer paddock to be monitored in 2021).
- To assess the value of adding increased P, K, and S when targeting higher yield potential rather than N alone.

### Key Points:

- *There was no response above the standard N input of 130kg N/ha, which also received a standard of 100kg/ha MAP at sowing (10N, 21.9P).*
- *Protein levels (12.1% in the standard) and dry matter at harvest indicated that yield was maximised at this level of nutritional input.*
- *Protein was increased by more N applied but yield was unaffected.*
- *Test weight was significantly reduced but differences were small (1kg/hL)*

**Treatments:** Five different nutrition strategies were put in place in RGT Accroc that differed in the level of nutrition (N, P, K & S). The same trial was set up in the surrounding farm crop. The starting nitrogen (N) in the soil was 228.13kg N/ha (0- 90cm).

**Table 1.** The effect of crop nutrition on harvest dry matter (t/ha), yield (t/ha), and grain quality

| Name                     | Harvest<br>Dry Matter<br>(t/ha) | Yield<br>(t/ha) | Protein<br>(%) | Test<br>Weight<br>(kg/hl) | Screening<br>(%) |
|--------------------------|---------------------------------|-----------------|----------------|---------------------------|------------------|
| 130N (standard)          | 14.9 -                          | 7.25 -          | 12.1 c         | 73.5 -                    | 1.4 -            |
| 160N                     | 15.2 -                          | 7.67 -          | 12.1 c         | 73.0 -                    | 1.5 -            |
| 190N                     | 13.7 -                          | 7.39 -          | 12.2 bc        | 73.6 -                    | 1.4 -            |
| 160N + 40P + 37K + 38S   | 15.0 -                          | 7.53 -          | 12.4 a         | 73.2 -                    | 1.5 -            |
| 190N + 40P + 37K + 38S   | 16.3 -                          | 7.50 -          | 12.3 ab        | 72.7 -                    | 1.8 -            |
| <b>Grand Mean</b>        | 15.0                            | 7.47            | 12.2           | 73.2                      | 1.50             |
| <b>LSD P=.05</b>         | ns                              | ns              | 0.20           | ns                        | ns               |
| <b>Treatment Prob(F)</b> | 0.130                           | 0.619           | 0.010          | 0.416                     | 0.227            |

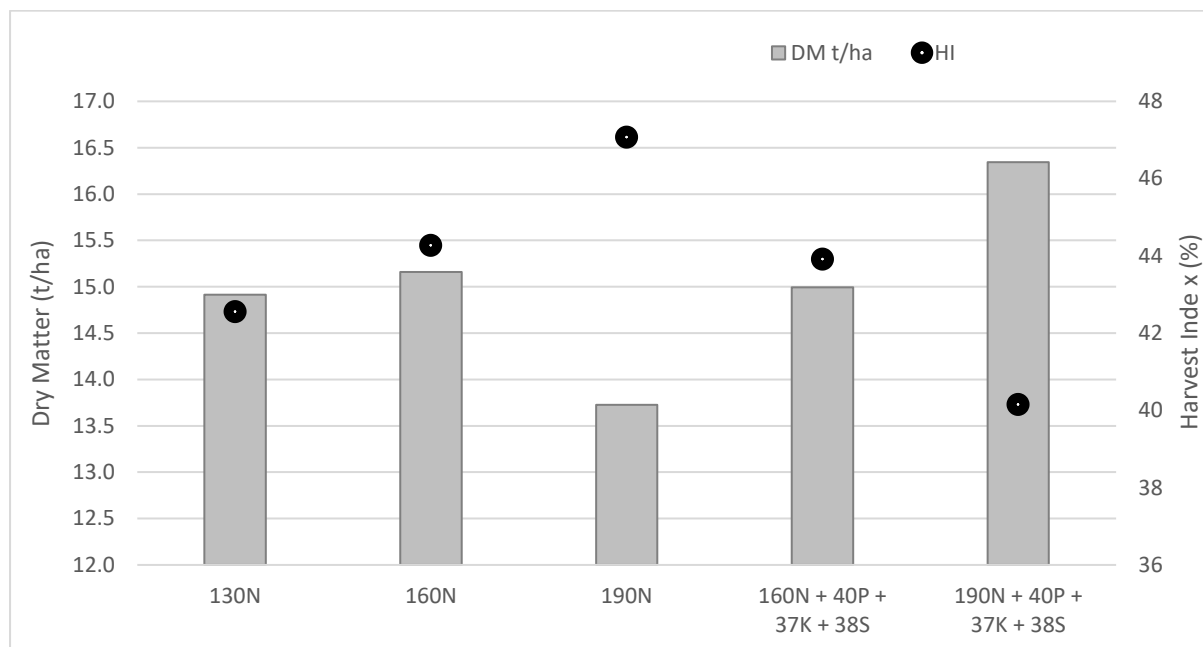
The effect of nutrition on dry matter at harvest gave variable results, particularly where 190kg N/ha was applied alone. It is these apparently aberrant results that would appear to indicate that harvest index is improved at 190kg N/ha (Figure 1).

**Table 2.** Site soil test details

|                                 | Level Found  |
|---------------------------------|--------------|
| <b>ECEC</b>                     | 50.5 cmol/kg |
| <b>Organic Carbon 9W&amp;B)</b> | 9.83 %       |
| <b>pH 1:5 water</b>             | 7.64         |

|                           |                |
|---------------------------|----------------|
| <b>Total Mineral N*</b>   | 228.13 kg N/ha |
| <b>Colwell Phosphorus</b> | 42 mg/kg       |
| <b>Colwell Potassium</b>  | 320 mg/kg      |
| <b>KCI Sulfur</b>         | 86 mg/kg       |

\*Mineral N 0-90cm sampled 29/6/2020, all other results 0-10cm depth sampled 8/4/2020



**Figure 1.** Effect of Nutrition strategy on harvest Dry Matter and harvest Index 13 December.

**Table 3.** Trial input and management details (kg, g, ml/ha).

|                          |              |                                    |
|--------------------------|--------------|------------------------------------|
| <b>Plant pop'n:</b>      |              | 180 seeds/m <sup>2</sup>           |
| <b>Seed treatment:</b>   |              | Vibrance/Gaucha                    |
| <b>Basal Fertiliser:</b> | 16 April     | 100kg MAP                          |
| <b>Nitrogen:</b>         | 29 July      | 87 kg Urea (40 N) ± treatment list |
|                          | 11 August    | 87 kg Urea (40 N) ± treatment list |
|                          | 2 September  | 87 kg Urea (40 N)                  |
| <b>Fungicide*:</b>       | 25 August    | Prosaro 300mL/ha                   |
|                          | 14 September | Radial 840mL/ha                    |
|                          | 28 October   | Opus 500mL/ha                      |

*All inputs of insecticides and herbicides were standard across the trial.*

## Trial 7. Erect Head Control in April Sown Wheat

### Objectives:

To assess the principal causes of erect heads in April sown wheat crops

Individual objectives specific to the trial are:

- To determine the value of Barley Yellow Dwarf Virus (BYDV) tolerance in HRZ wheat crops using a tolerant (cv Manning) and a non-tolerant (cv RGT Relay) cultivar.