

# WHEAT VARIETY TRIAL

Darren Chitty, Research Agronomist, Agritech Crop Research



## AIM

Comparison of wheat varieties and effect of nitrogen on yield and quality.

## BACKGROUND

This trial was established for the Liebe Group to obtain quantifiable yield and quality data on commonly grown and soon to be released wheat varieties.

## TRIAL DETAILS

|                                    |                                                                               |
|------------------------------------|-------------------------------------------------------------------------------|
| <b>Property</b>                    | Hyde Park Farms, Liebe Main Trial Site, Dalwallinu                            |
| <b>Plot size &amp; replication</b> | 12m x 2.5m, 3 replications                                                    |
| <b>Soil type</b>                   | Deep sandy loam                                                               |
| <b>Sowing date</b>                 | 18 <sup>th</sup> May 2005                                                     |
| <b>Seeding rate</b>                | 75 kg/ha                                                                      |
| <b>Fertiliser (kg/ha)</b>          | MAPSZC 100 kg/ha + Urea 60 kg/ha or 100 kg/ha                                 |
| <b>Paddock rotation</b>            | 2003 – wheat, 2004 - pasture                                                  |
| <b>Herbicides</b>                  | Roundup Powermax 2 L, TriflurX 1.5 L, Logran 35g, Tigrex 500mL, Lontrel 100mL |
| <b>Growing Season</b>              | 258mm                                                                         |
| <b>Rainfall</b>                    |                                                                               |

## RESULTS

**Table 1:** Average Yield (t/ha) 182 DAA Factorial Analysis.

| Rating Data Type<br>Rating Unit<br>Trt-Eval Interval |                        | Yield<br>t/ha<br>182 DA-A |
|------------------------------------------------------|------------------------|---------------------------|
| No.                                                  | Treatment              |                           |
| TABLE OF R MEANS                                     |                        |                           |
| Replicate 1                                          |                        | 2.623 b                   |
| Replicate 2                                          |                        | 2.787 a                   |
| Replicate 3                                          |                        | 2.682 b                   |
| LSD (P=0.05)                                         |                        | 0.101                     |
| TABLE OF A MEANS                                     |                        |                           |
| 1                                                    | 27.6 N (Urea 60 kg/ha) | 2.650 b                   |
| 2                                                    | 46 N (Urea 100 kg/ha)  | 2.745 a                   |
| LSD (P=0.05)                                         |                        | 0.083                     |

**Table 2:** Growth Stage (Zadoks) 103 & 113 DAA, and Yield (t/ha) Analysis of Variance.

| Part Rated        |                 |                        | Growth     | Growth    |            | Factorial B |
|-------------------|-----------------|------------------------|------------|-----------|------------|-------------|
| Rating Data Type  |                 |                        | Stage      | Stage     | Yield      | Average     |
| Rating Unit       |                 |                        | Zadocks    | Zadocks   | t/ha       | Yield       |
| Rating Date       |                 |                        | 29/08/2005 | 8/09/2005 | 16/11/2005 | 16/11/2005  |
| Trt-Eval Interval |                 |                        | 103 DA-A   | 113 DA-A  | 182 DA-A   | 182 DA-A    |
| No.               | Variety         | Fertiliser             |            |           |            |             |
| 1                 | Calingiri       | 27.6 N (Urea 60 kg/ha) | Z55 ef     | Z59       | 2.685 b-f  | 2.75 abc    |
| 13                |                 | 46 N (Urea 100 kg/ha)  | Z55 ef     | Z59       | 2.815 a-e  |             |
| 2                 | Wyalkatchem     | 27.6 N (Urea 60 kg/ha) | Z59 bc     | Z59       | 2.722 b-f  | 2.806 ab    |
| 14                |                 | 46 N (Urea 100 kg/ha)  | Z59 bc     | Z59       | 2.889 abc  |             |
| 3                 | Carnamah        | 27.6 N (Urea 60 kg/ha) | Z52 g      | Z59       | 2.787 a-e  | 2.829 ab    |
| 15                |                 | 46 N (Urea 100 kg/ha)  | Z52 g      | Z59       | 2.870 a-d  |             |
| 4                 | Arrino          | 27.6 N (Urea 60 kg/ha) | Z58 bcd    | Z71-73    | 2.556 efg  | 2.593 cde   |
| 16                |                 | 46 N (Urea 100 kg/ha)  | Z58 bcd    | Z71-73    | 2.630 c-g  |             |
| 5                 | EGA Bonnie Rock | 27.6 N (Urea 60 kg/ha) | Z62 a      | Z71-73    | 2.472 fg   | 2.532 de    |
| 17                |                 | 46 N (Urea 100 kg/ha)  | Z62 a      | Z71-73    | 2.593 efg  |             |
| 6                 | EGA Eagle rock  | 27.6 N (Urea 60 kg/ha) | Z57 cde    | Z59       | 2.361 g    | 2.463 e     |
| 18                |                 | 46 N (Urea 100 kg/ha)  | Z57 cde    | Z59       | 2.565 efg  |             |
| 7                 | Tamarin Rock    | 27.6 N (Urea 60 kg/ha) | Z62 a      | Z77       | 2.602 d-g  | 2.602 cde   |
| 19                |                 | 46 N (Urea 100 kg/ha)  | Z62 a      | Z77       | 2.602 d-g  |             |
| 8                 | Drysdale        | 27.6 N (Urea 60 kg/ha) | Z60 ab     | Z71-73    | 2.370 g    | 2.500 e     |
| 20                |                 | 46 N (Urea 100 kg/ha)  | Z60 ab     | Z71-73    | 2.630 c-g  |             |
| 9                 | Yitpi           | 27.6 N (Urea 60 kg/ha) | Z53 fg     | Z71-73    | 2.806 a-e  | 2.875 ab    |
| 21                |                 | 46 N (Urea 100 kg/ha)  | Z53 fg     | Z71-73    | 2.944 ab   |             |
| 10                | GBA Ruby        | 27.6 N (Urea 60 kg/ha) | Z60 ab     | Z59       | 2.676 b-f  | 2.736 bc    |
| 22                |                 | 46 N (Urea 100 kg/ha)  | Z60 ab     | Z59       | 2.796 a-e  |             |
| 11                | WAWHT 2524      | 27.6 N (Urea 60 kg/ha) | Z56 de     | Z71-73    | 3.028 a    | 2.949 a     |
| 23                |                 | 46 N (Urea 100 kg/ha)  | Z56 de     | Z71-73    | 2.870 a-d  |             |

|                   |            |                        |        |     |           |           |
|-------------------|------------|------------------------|--------|-----|-----------|-----------|
| 12                | WAWHT 2773 | 27.6 N (Urea 60 kg/ha) | Z52 g  | Z59 | 2.731 b-f | 2.731 bcd |
| 24                |            | 46 N (Urea 100 kg/ha)  | Z52 g  | Z59 | 2.731 b-f |           |
| LSD (P=.05)       |            |                        | 2      |     | 0.271     | 0.203     |
| CV                |            |                        | 3      |     | 6.080     | -         |
| Replicate F       |            |                        | 29.652 |     | 6.173     | 5.517     |
| Replicate Prob(F) |            |                        | 0.0001 |     | 0.0043    | 0.007     |
| Treatment F       |            |                        | 17.841 |     | 3.198     | 4.894     |
| Treatment Prob(F) |            |                        | 0.0001 |     | 0.0005    | 0.000     |

Means followed by same letter do not significantly differ (P=.05, LSD)

**Table 3:** Grain yield, quality, receival grade and gross margins for 2005.

| Treatment          |                 | Yield<br>(t/ha) | Protein<br>(%) | Screenings<br>(%) | Grade             | Gross<br>Margin<br>\$/ha |
|--------------------|-----------------|-----------------|----------------|-------------------|-------------------|--------------------------|
| Variety            | Urea<br>(kg/ha) |                 |                |                   |                   |                          |
| Calingiri          | 60              | 2.685           | 10             | 2.55              | ASWN              | 148                      |
|                    | 100             | 2.815           | 10             | 2.7               | ASWN              | 151                      |
| Wyalkatchem        | 60              | 2.722           | 10.5           | 1.71              | APW               | 165                      |
|                    | 100             | 2.889           | 10.7           | 1.58              | APW               | 184                      |
| Carnamah           | 60              | 2.787           | 10.2           | 3.39              | AH                | 160                      |
|                    | 100             | 2.87            | 10             | 3.54              | AH                | 150                      |
| Arrino             | 60              | 2.556           | 10.6           | 1.53              | ASWN              | 135                      |
|                    | 100             | 2.63            | 10.9           | 1.86              | ASWN              | 124                      |
| EGA Bonnie<br>Rock | 60              | 2.472           | 10.9           | 2.13              | AH                | 151                      |
|                    | 100             | 2.593           | 11.2           | 2.51              | AH                | 150                      |
| EGA Eagle<br>rock  | 60              | 2.361           | 11.5           | 4.66              | AH                | 121                      |
|                    | 100             | 2.565           | 11             | 4.66              | AH                | 120                      |
| Tammarin<br>Rock   | 60              | 2.602           | 10.6           | 2.45              | AH                | 165                      |
|                    | 100             | 2.602           | 10.6           | 2.7               | AH                | 149                      |
| Drysdale           | 60              | 2.37            | 10.7           | 4.32              | AH                | 106                      |
|                    | 100             | 2.63            | 10.8           | 4.39              | AH                | 124                      |
| Yitpi              | 60              | 2.806           | 9.9            | 5.77              | AH                | 141                      |
|                    | 100             | 2.944           | 10.2           | 5.85              | AH                | 149                      |
| GBA Ruby           | 60              | 2.676           | 10.5           | 2.51              | ASW               | 112                      |
|                    | 100             | 2.796           | 10.9           | 2.78              | ASW               | 112                      |
| WAWHT 2524         | 60              | 3.028           | 10.4           | 3.74              | <sup>a</sup>      |                          |
|                    | 100             | 2.87            | 10.8           | 3.47              |                   |                          |
| WAWHT 2773         | 60              | 2.731           | 10.4           | 3.28              | <sup>b</sup> ASWN | 150                      |
|                    | 100             | 2.731           | 10.5           | 3.37              | ASWN              | 133                      |

Note: 2005 GM (\$/ha) assuming EPR base rates ASW (\$176), APW (\$ 191), ASWN (\$191) and AH (\$204) as of the week of Dec 1<sup>st</sup> 2005. Estimated gross margins were calculated using full variable costs as per Farm Budget Guide 2005 (Urea \$409). Variety premium for Arrino \$14/t and Bonnie Rock \$5/t.

#### COMMENTS

Yields ranged from 2.4 to 3.0 t/ha. On average, WAWHT 2524 yielded 2.95 t/ha (Table 2) however this was not significantly different from Calingiri, Wyalkatchem, Carnamah or Yitpi. <sup>a</sup>WAWHT 2524 will not be released this year as its grain quality did not achieve a milling grade classification. <sup>b</sup>WAWHT 2773 is a potential noodle wheat with slightly shorter maturity than Calingiri. It is undergoing final quality evaluation and a decision on its release will be made later this year.

The factorial analysis (Table 1) shows on average, an extra 95 kg of wheat was obtained by increasing the rate of urea from 60 kg/ha to 100 kg/ha. This increase in yield had very little effect on the gross margins, with the extra wheat being cancelled out by the cost of the additional urea.

Relative maturities of the varieties are also shown (Table 2). The Zadoks growth stage was recorded around the time of anthesis on 29<sup>th</sup> August and 8<sup>th</sup> September. This table also shows the individual responses to nitrogen application.

The best gross margin was achieved by Wyalkatchem (\$184/ha) at a urea rate of 100 kg/ha.

**PAPER REVIEWED BY: BARRETT SINCLAIR**