Practice for Profit

Aim: To test the effect of four levels of management inputs on grain yield, quality and profitability.

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Farmer: Keith Carter **Location:** Liebe Main Trial Site, Jibberding Hall Rd, Wubin

Background: Agritech Crop Research conducted this trial in order to determine the profitability of four levels of crop management inputs – low, district average, high and seasonally active. These treatments were applied to noodle wheat varieties Arrino and Calingiri. Arrino was chosen for its disease susceptibility, with Calingiri being a longer season variety well adapted to the local environment with better disease resistance.

Low input treatments are based on a farmer delivering grain to the bin at the lowest possible cost, regardless of seasonal conditions. District average inputs are based on what is thought to be common grower practice in the Liebe Group area. High input treatments simulate a paddock with high yield potential matched with increased management inputs to maximise yields and profitability. The Active treatments are dependent on seasonal conditions and are determined by the Liebe R&D Committee.

The trial is intended to run over 10 seasons with this being the third year. The previous two years of the trial have been on or east of the Great Northern Highway and experienced what would be classed as average to below average seasonal conditions (rainfall). In 2001, a dry middle and end to the season saw lower yields, resulting in the low input treatment being the most profitable. In 2002, severe moisture stress lead to very poor crop growth and the trial was not harvested.

Trial Details:

| Plot size and replication | 12m x 10m |
|---------------------------|--|
| Soil type | Sandy loam |
| Sowing date | 21 st May |
| Conditions at sowing | Ideal |
| Machinery | Knife Point Minimum Till on 22cm spacings (Morris Gumbo boots) |
| Paddock history | 2002 = Failed lupins, 2001 = Wheat, 2000 = Pasture |

Assessment Timings

| Date of assessment | Days after Sowing | Crop stage | Description |
|--------------------|-------------------|------------|----------------------------|
| 15/07/03 | 56 | Z15/21 | crop counts (plants/m row) |
| 15/07/03 | 56 | Z15/21 | crop vigour (1-9) |
| 13/11/03 | - | maturity | head counts (heads/m row) |
| 13/11/03 | - | maturity | harvest |

Assessment Technique:

- Vigour Assessed by visually evaluating the general health of the crop and assigning it a score from 1-9, 1 being poor growth and 9 being excellent health and growth.
- Plant Counts A 1 metre rule was randomly placed in the plot and both plants rows either side of the rule were counted to give plant numbers. This was repeated three times in every plot.
- Head Counts A 1 metre rule was randomly placed in the plot and both plants rows either side of the rule were counted to give head numbers. This was repeated three times in every plot.

Trial Treatments:

| No. | Treatment | Rate | | Timing | Code |
|-----|-------------------|------------------|-----------|-------------|------|
| 1/5 | Arrino/Calingiri | | | | |
| | Low input | | | | |
| | Seed | 50 | kg/ha | | В |
| | nil seed dressing | | | | |
| | Glean | 10 | g/ha | IBS | А |
| | BS1000 | 0.2 | % V/V | IBS | А |
| | DAP | 50 | kg/ha | side banded | В |
| | Diuron | 350 | mL/ha | Z15/21 | С |
| | МСРА | 400 | mL/ha | Z15/21 | С |
| 2/6 | Arrino/Calingiri | | | | |
| | District input | | | | |
| | Seed | 70 | kg/ha | | В |
| | Premis | 100 | mL/100 kg | on seed | В |
| | Trifluralin | 1.5 | L/ha | IBS | А |
| | Logran | 35 | g/ha | IBS | А |
| | BS1000 | 0.2 | % V/V | IBS | А |
| | Agstar | 100 kg/ha side l | | side banded | В |
| | Urea | 50 | kg/ha | IBS | А |
| | 2,4-D Amine | 1 L/ha Z15/21 | | С | |
| 3/7 | Arrino/Calingiri | | | | |
| | High input | | | | |
| | Seed | 100 | kg/ha | | В |
| | Real | 150 | mL/100 kg | On seed | В |
| | Trifluralin | 1.5 | L/ha | IBS | А |
| | Logran | 35 | g/ha | IBS | А |
| | BS1000 | 0.2 | % V/V | IBS | А |
| | Agstar | 140 | kg/ha | side banded | В |
| | Urea | 80 | kg/ha | IBS | А |
| | Fastac | 150 | mL/ha | Z13 | С |
| | Tigrex | 500 | mL/ha | Z15/21 | С |
| | Triad | 500 | mL/ha | Z31 | D |
| | MOP | 80 | kg/ha | Z15/21 | С |
| | Coptrel | 250 | mL/ha | Z57 | Е |
| 4/8 | Arrino/Calingiri | | | | |
| | Active input | | | | |
| | Seed | 70 | kg/ha | | В |
| | Trifluralin | 1.5 | L/ha | IBS | А |
| | Agstar | 42.3 | kg/ha | side banded | В |
| | LVE MCPA | 1.2 | L/ha | Z15/21 | С |
| | Flexi-N | 50 | L/ha | Z15/21 | С |

Results:

Table 1: Crop Vigour 55 DAS (1-9), Plant Counts 55 DAS (/m row), Head Counts (/m row), Yield (t/ha), Protein (%) and Screenings (%).

| No. | Treatment | Vigo | ur | Plar | nts | Head | ds | Yiel | d | Protein | Screenings |
|-------|--------------------------|------|----|------|------|-------|------|------|-----|---------|------------|
| 1 | Low Input Arrino | 7.8 | b | 28.0 | e | 45.56 | d | 1.95 | b | 10.5 | 2.6 |
| 2 | District Input Arrino | 8.6 | a | 39.8 | с | 73.44 | ab | 2.37 | а | 10.9 | 1.6 |
| 3 | High Input Arrino | 8.0 | b | 52.8 | а | 79.78 | а | 2.20 | а | 11.3 | 2.1 |
| 4 | Active Input Arrino | 8.5 | a | 37.4 | d | 39.11 | d | 1.94 | b | 11.4 | 2.2 |
| 5 | Low Input Calingiri | 8.0 | b | 27.6 | e | 41.11 | d | 2.24 | а | 11.1 | 2.6 |
| 6 | District Input Calingiri | 8.5 | a | 38.5 | cd | 68.67 | bc | 2.41 | а | 11.4 | 2.8 |
| 7 | High Input Calingiri | 8.0 | b | 46.6 | b | 77.89 | а | 2.37 | а | 11.1 | 2.8 |
| 8 | Active Input Calingiri | 8.5 | a | 37.7 | d | 64.22 | с | 2.24 | а | 11.1 | 2.4 |
| | | | | | | | | | | | |
| LSD | (P=.05) | 0. | 22 | | 2.11 | | 8.37 | 0 | .21 | NSD | NSD |
| CV | | 1. | 53 | | 3.13 | | 7.81 | 5 | .35 | 3.79 | 20.69 |
| Repli | cate F | 0. | 10 | | 0.06 | | 0.03 | 0 | .96 | 4.49 | 6.17 |
| Repli | cate Prob(F) | 0. | 90 | | 0.94 | | 0.97 | 0 | .41 | 0.03 | 0.01 |
| Treat | ment F | 18. | 01 | 14 | 7.82 | 3 | 7.02 | 7 | .16 | 1.54 | 1.94 |
| Treat | ment Prob(F) | 0. | 00 | | 0.00 | | 0.00 | 0 | .00 | 0.23 | 0.14 |

Table 2: Economic Analysis (\$/ha)

| Treatment | Yield (t/ha) | Gross Return | Variable Costs | Gross Margin |
|-----------|--------------|--------------|----------------|---------------------|
| 1 | 1.95 | 492.06 | 43.52 | 448.54 |
| 2 | 2.37 | 599.91 | 107.87 | 492.04 |
| 3 | 2.2 | 547.12 | 195.66 | 351.46 |
| 4 | 1.94 | 480.74 | 69.66 | 411.08 |
| 5 | 2.24 | 555.94 | 43.52 | 512.42 |
| 6 | 2.41 | 591.65 | 107.87 | 483.78 |
| 7 | 2.37 | 588.03 | 195.66 | 392.37 |
| 8 | 2.24 | 556.76 | 69.66 | 487.10 |

Based on EPR for 6/1/04 ASWN Base Price \$238/tonne

Crop Vigour

All treatments displayed excellent plant health and vigour with only slight differences between treatments.

Plant and Head Counts

As expected plant numbers are closely related to seeding rate, higher rates giving more plants per metre of row. Head numbers follow similar trends given that dry conditions in July affected plant development during the tillering period. The high input treatment of Arrino had significantly more plants per metre than the same treatment in Calingiri due to smaller seed size. This difference was not carried through to head numbers.

Yield

When comparing varieties, Calingiri (2.31 t/ha) yielded 9% higher than Arrino (2.12 t/ha). Calingiri also yielded 14% higher than Arrino in the Wheat CVT trial located in the same paddock, an indication that the longer season varieties like Yitpi, EGA Blanco, Braewood and Calingiri, were able to benefit from late rain in September. The growers' paddock surrounding both trials was sown two weeks later to Arrino and yielded 2.5 t/ha. The crop was less affected by the dry July and benefited from late September rainfall.

All four treatments of Calingiri as well as the district and high input treatments of Arrino yielded significantly higher than the low and active input treatments of Arrino. The highest yielding treatment was Trt 6 (Calingiri district inputs) 2.41 t/ha, followed by Trt 2 (Arrino district inputs) and Trt 7(Calingiri high inputs) 2.37 t/ha [table 1].

Protein

Arrino with low inputs had significantly lower protein than all other treatments. The application of post emergent Flexi-N (Z 15/21) had no significant impact on protein levels in either variety.

Screenings

Arrino with district inputs had significantly lower screenings than all other treatments. As a rule Calingiri had higher screenings than Arrino.

Economic Analysis

The district input treatments of each variety returned the highest gross return per hectare and although Calingiri (\$592 /ha) yielded higher, Arrino (\$599 /ha) provided slightly higher returns, having slightly better grain quality. A gross margin analysis shows the low input treatments of Calingiri (\$512/ha) as being the most profitable, closely followed by active inputs Calingiri (\$487 /ha) and district inputs Arrino (\$492 /ha). The high input treatments for both varieties were least profitable, Arrino (\$351 /ha) and Calingiri (\$397 /ha), even though yields were relatively high [table 2].

Summary:

- Calingiri generally yielded higher than Arrino, had slightly higher protein and screenings.
- The highest yielding treatment of each variety were the district input treatments, Calingiri 2.41t /ha and Arrino 2.37 t/ha.
- The district input treatments of each variety returned the highest gross return per hectare and although Calingiri (\$592 /ha) yielded higher, Arrino (\$599 /ha) provided slightly higher returns, having slightly better grain quality.
- The low input Calingiri treatment was the most profitable on comparing gross margins, returning \$512 /ha, closely followed by active inputs Calingiri (\$487 /ha) and district inputs Arrino (\$492 /ha).
- The extra costs in the high input treatments were not recouped at harvest, gross margin analysis shows them as the least profitable, Arrino (\$351/ha) and Calingiri (\$392 /ha).

Technically reviewed by: Peter Burgess