2.1.5 GrainSearch wheat variety trial - Inverleigh & Dunkeld, Vic

Location:
Inverleigh (E. Peel) & Dunkeld research sites.

Funding:
GrainSearch Pty Ltd funded trials.

Researchers:
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Background/Aim:
These trials compare a number of feed and milling quality varieties that are commercially available against several long season durum lines potentially suited to southwest Victoria. These variety trials were evaluated with a fungicide programme, to determine the yield response of the varieties by comparing controlled leaf disease against an untreated control.

Summary of findings:
- The average yield for the GrainSearch Inverleigh wheat trail was 5.28 t/ha, whilst Dunkeld averaged 5.20 t/ha.
- Beaufort and Revenue were the standout performers at the Dunkeld site yielding 7.08 and 6.86 t/ha respectively.
- Revenue and Beaufort were the standout performers at the Inverleigh site yielding 6.21 and 6.18 t/ha respectively.
- Early sowing at both sites was essential to achieve high yields in long season varieties.
- Grain quality was adversely affected at both sites by late season rain, all varieties were of feed quality due to sprouted grain and low test weight.s

Trial information:
Trial design consisted of fully randomized and replicated trials using 3 replicates with foliar fungicide and leaving 1 replicate untreated, to demonstrate local disease pressure and variety susceptibility.

Rainfall:
Inverleigh
Avg. Annual: 483.9mm, Sheoaks 1991-2009
Avg. G.S.R.: 386.5mm, Sheoaks 1991-2009
2010 Total: 672.9mm E. Peel Inverleigh Site
2010 G.S.R.: May-November 459.7mm E. Peel Inverleigh Site

Dunkeld
Avg. Annual: 587.3mm Hamilton Airport 1991-2009
Avg. G.S.R.: 460.2mm Hamilton Airport 1991-2009
2010 Total: 736.6mm Dunkeld Site
2010 G.S.R.: May-November 439.4mm Dunkeld Site

Paddock History:
Inverleigh
2009: Canola
2008: n/a

Dunkeld
2009: Beans
2008: Wheat

Soil Characteristics:

Inverleigh
Soil Type: Clay loam
Soil Nutrients:
N = 11 mg/kg (0-60cm)
P = 70 mg/kg (Colwell, 0-60cm)
K = 0.33 Meq/100g (0-60cm)
S = 24 mg/kg (0-60cm)
pH (water) = 5.1

Dunkeld
Soil Type: Clay loam
Soil Nutrients:
N = 91mg/kg (0-60cm)
P = 40mg/kg (Colwell, 0-60cm)
K = 0.78 Meq/100g (0-60cm)
S = 47mg/kg (0-60cm)
pH (water) = 5.7

Inverleigh

Sowing rate:
Seeding rate based on seed size with a desire to establish 175 plants/m^2

Sowing date: 9th May 2010

Fertiliser:
- 2/6/2010 100kg/ha MAP at sowing, 50kg Urea at GS15
- 26/8/2010 50kg Urea at GS31

Fungicides:
- 23/9/2010 Prosaro @ 0.20L/ha + 1% Hasten
- 24/10/2010 Prosaro @ 0.20L/ha + 1% Hasten

Herbicides:
- 9/5/2010 Roundup P'max @ 1.5L/ha + Striker @ 0.2L/ha + Triflur @ 2.0L/ha
- 17/8/2010 Axial @ 0.3L/ha + 0.5% Adigor + Precept @ 0.5L/ha + Lontrel @ 0.25L/ha

Treatments:
12 treatments made up of 3 feed wheats, 2 milling wheats and 7 exp durum wheats

Plot size: 10m x 1.45m x 4 reps.

Dunkeld

Sowing rate:
Seeding rate based on seed size with a desire to establish 175 plants/m^2

Sowing date: 26th May 2010

Fertiliser:
8/09/2010 100kg/ha MAP at sowing, 110kg Urea at GS30

Fungicides:
- 30/9/2010 Prosaro @ 0.15L/ha + 1% Hasten
- 26/10/2010 Prosaro @ 0.3L/ha + 1% Hasten
- 11/11/2010 Tilt 0.5L/ha

Herbicides:
- 25/5/2010 Roundup P'max @ 1.5L/ha + Surpass @ 0.5L/ha + LI-700 @ 0.3L/ha
- 26/5/2010 Dual Gold @ 0.5L/ha + Diuron @ 0.25L/ha
- 30/9/2010 Axial @ 0.3L/ha + 0.5% Adigor + Precept @ 0.5L/ha

Treatments:
12 treatments made up of 3 feed wheats, 2 milling wheats and 7 exp durum wheats

Plot size: 10m x 1.45m x 4 reps.

Results and discussion:
The early sown wheat trial at Inverleigh yielded an average of 5.28t/ha for the 2010 season. Revenue was the highest yielding variety at Inverleigh with 6.21t/ha followed by Beaufort with 6.18t/ha, significantly out yielded current milling and exp durum varieties. In general, the longer season varieties yielded higher than the short season varieties, which is to be expected based on the early sowing and late season rainfall. The Dunkeld site yielded an average of 5.20t/ha. Beaufort was the highest yielding variety at 7.08t/ha, followed by Revenue at 6.86t/ha. The high yield potential and late season nature of these varieties were able to maximise their potential due to late season rainfall. Note that the grain yield CV for the Dunkeld site at 22.05 is relatively high and results should be interpreted with caution.

Grain Quality was reduced across all varieties at both sites as a result of unseasonal rains in November and December. All varieties at both Dunkeld and Inverleigh were downgraded to feed grade due to sprouted grain. Test weights at Dunkeld and Inverleigh were low with site means of 66.75kg/hL and 71.30kg/hL respectively. Protein levels were also low at both sites with site means of 12.11% and 12.80% at Dunkeld and Inverleigh respectively. Experimental durum lines generally expressed high protein values than feed and milling varieties.

Summary:
2010 could have been a great season if not for an extremely wet finish. Grain Quality at both Dunkeld and Inverleigh sites was poor due to late season rain, all grain samples were downgraded to FED1 due to sprouted grain. Long season varieties took advantage of late season rain, out yielding all early season varieties. Early sowing was a key factor in yield potential at both sites, with both winter and spring wheats achieving exceptional yields.

Table 1: Inverleigh Grain yield and grain quality analysis including protein, test weight & screenings

Variety	Cereal Yield t/ ha, 29/01/2011 GS90-99	Cereal Yield % Site Mean	Protein %	Test Weight kg/hL	Screening % w/w
Revenue	6.21a	117	11.1i	69.6bc	1.5cd
Beaufort	6.18a	117	11.9gh	68.8c	3.8a
LBP 07-0402	5.68ab	107	12.4ef	71.9abc	1.5cd
AZD 44	5.36bc	101	13.5bc	73.3a	1.0d
Bolac	5.33bcd	100	12.7e	72.1ab	2.0bc
Mackellar	5.26bcd	99	11.8h	69.5bc	2.8b
LRD 40012	5.19bcd	98	13.6bc	71.6abc	1.5cd
LRD 40010	4.95cd	93	13.9ab	73.9a	1.0d
Caparoi	4.88cd	92	13.2cd	73.2a	1.5cd
Derrimut	4.87cd	92	12.3fg	69.4bc	2.8b
Bellaroi	4.78cd	90	14.2a	70.8abc	1.0d
AZD 61	4.64d	87	12.8de	72ab	1.3cd
LSD (P=0.05)	**0.69**	-	**0.4**	**3.2**	**0.8**
Site Mean	**5.28**	-	**12.8**	**71.3**	**1.8**
Standard Deviation	**0.48**	-	**0.3**	**2.2**	**0.5**
CV	**9.03**	-	**2.3**	**3.1**	**29.6**

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

Table 2: Dunkeld Grain yield and grain quality analysis including protein, test weight & screenings

Variety	Cereal Yield t/ ha, 29/01/2011 GS90-99	Cereal Yield % Site Mean	Protein %	Test Weight kg/hL	Screening % w/w
Beaufort	7.08a	136	11.58cde	68.40ab	2.00bc
Revenue	6.86a	132	10.13f	65.55bc	2.00bc
LPB 07-0402	6.61ab	127	11.93b-e	71.35a	1.25c
Bolac	5.93bc	114	12.23b-e	66.55bc	3.00b
LRD 040012	5.48cd	105	12.65bc	66.20bc	2.25b
Derrimut	5.35cd	103	11.28def	67.20ab	1.75c
Mackellar	4.89de	94	11.00ef	65.50bc	6.75a
AZD 44	4.40ef	84	12.43bcd	68.50ab	1.00c
Caparoi	4.00f	77	12.85abc	64.6bc	1.75c
Bellaroi	3.96f	76	14.00a	62.3c	1.75c
AZD 61	3.93f	75	12.25b-e	66.45bc	1.25c
LRD 040010	3.87f	74	13.03ab	68.4ab	1.25c
LSD (P=0.05)	**0.81**	-	**1.32**	**4.48**	**1.16**
Site Mean	**5.20**	-	**12.11**	**66.75**	**2.17**
Standard Deviation	**1.15**	-	**1.26**	**3.60**	**1.65**
CV	**22.05**	-	**10.40**	**5.39**	**76.15**

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