



AgGrow
AGRONOMY + RESEARCH



WHEAT & BARLEY VARIETY TRIALS

Rankins Springs & Hillston, 2017

INDEPENDENT AGRONOMY ADVICE + CUTTING EDGE RESEARCH

Hart Bros Seeds Wheat & Barley Variety Trials

KEY POINTS

- Growing conditions in 2017 were characterised by severe frosts and below average growing season rainfall. This had an impact on some of the varieties more than others, given their differing maturities at the time the frosts occurred.
- Although stem frost played a part in the results at the Rankins Springs dryland site, longer season varieties such as Kittyhawk tended to yield the highest following a long fallow.
- Conditions at the irrigated Hillston site favoured the durum wheat varieties with DBA_Vittaroi, DBA_Bindaroi and Caparoi all yielding well. DBA_Vittaroi had the least amount of lodging out of the durums, standing at harvest.
- Barley did not perform well on irrigation as a lot of the heads were lost before harvest. Grain quality of barley was also affected.

BACKGROUND

Each year there are a number of new wheat and barley varieties in the pipeline, and some on the market. Growers in the area would like to see these varieties trialled in their region to see if they offer any advantage in terms of yield and quality over their current commercially grown varieties.

This is the fourth year these trials have been run in the area, in conjunction with Hart Bros Seeds. They give a good comparison of varietal performance across seasons and compliment the NVT trials, as they give us an opportunity to see how new varieties perform under local dryland and irrigated conditions.

TRIAL DETAILS

The two trials were established in May 2017. The dryland trial was established at Michael Pfitzner's "Hill End" property on 9th May and the irrigated trial was established at Graeme Horneman's "Wilga Glen" property on 16th May, 2017.

The aim of the trials was to compare the performance of potential wheat and barley varieties with existing varieties commonly grown in southern NSW under local dryland and irrigated conditions. The focus of the trials was on yield and quality as well as acid soil tolerance on dryland, and lodging tolerance on irrigation.

Both the dryland and irrigated trial consisted of 45 varieties, including numbered lines, newly released and currently grown varieties, table 1.

The trials were replicated three times, with plot sizes 11m by 1.75m (19.25m²). Appropriate pest, disease and weed control was undertaken on both trials.

2017 Seasonal Conditions:

The 2017 season was relatively dry with 345mm of rain falling, compared to the long term average rainfall of 402mm. Growing season rainfall was well below average with only 92mm falling from 1st April to 30th September, compared to a long term average of 201mm, in Griffith.

Frosts throughout August were prolific with temperatures getting as low as -4.7°C on the 20th and -5.2°C on the 28th August in the paddock (data taken from temperature loggers at wheat head height in a semi enclosed plastic drum at the Rankins Springs site). These frost events were 11 hours and 12 hours in duration, respectively.

Mice were an issue throughout the 2017 season, causing a lot of damage in some paddocks. The trials were baited as needed for mice.

Rankins Springs Trial:

This trial was sown following a long fallow. It was sown on the 9th May at 30 kg/ha with 80 kg/ha MAP and also had 90 kg/ha of urea IBS. It recieved a fungicide spray at the end of July.

The growing season rainfall (1st April to 30th September) at Rankins Springs was 102mm. The trial was harvested on 24th November, 2017.

Hillston Trial:

This trial was sown following maize. It was sown on the 16th May at 100 kg/ha with 120 kg/ha MAP and had 200 kg/ha urea pre-drilled, and 300kg urea applied by topdressing, figure 1.

The growing season rainfall (1st April to 30th September) for Hillston was 104mm. The trial recieved 3 spring irrigations (3.3 ML/ha total irrigation), the first at the end of July, the second mid September, the third early October. Timely fungicide sprays were applied by air at the end of July and early October.

It was harvested on 30th November, 2017.

Figure 1: Sowing the Hillston trial, May 2017..



Table 1: Variety List for both of the trials.

VARIETY	
1	Beckom
2	Scepter
3	RAC2388
4	Coolah
5	V09150-01
6	Longsword
7	AGTD043
8	Corack
9	Suntop
10	Condo
11	Sunmate
12	Kiora
13	RGT Planet
14	DBA Bindaroi
15	HIL 049
16	LRPB Kittyhawk
17	LRPB Flanker
18	LRPB Trojan
19	LRPB Reliant
20	LRPB Mustang
21	LPB12-0152
22	LPB13-1995
23	LRPB Spitfire
24	LRPB Lancer
25	EGA Gregory
26	DS Pascal
27	DS Darwin
28	ADV09.0444
29	DS Faraday
30	Latrobe
31	Hindmarsh
32	Spartacus CL
33	EGA Wedgetail
34	Fathom
35	DBA Aurora
36	HV16
37	Caparoi
38	Sunvale
39	DBA Vittaroi
40	DBA Lillaroi
41	LRPB Cobra
42	Emu Rock
43	Chara
44	Bolac
45	Elmore CL

RESULTS AND DISCUSSION

Establishment scores, lodging, grain yield and quality, were measured on both trials and are shown in this section.

Statistical analysis was carried out on these trials for grain yield and quality.

Rankins Springs

Frost affected some of the varieties in this trial, given their differing maturities at the time the frosts occurred, figure 2. The worst frosting effect was stem frost in varieties (both wheat & barley) which were at the 1-3 node.

Establishment:

Establishment was scored from 0 to 9, with 0 being very poorly established and uneven and 9 being very evenly established.

Establishment scores were taken on 5th June, when the crop was around the 2 to 3 leaf stage, figure 3. Establishment scores ranged from 6 to 9, with the majority establishing well having a score of either 8 or 9.

The only establishment issues were with the barley varieties Fathom and LaTrobe, which both had establishment scores below 7, possibly due to seed quality.

Lodging Scores:

Lodging scores were taken before harvest. Lodging was scored on a scale of 0 to 9, with 0 indicating no lodging and 9 flat on the ground.

The only varieties to show any degree of lodging were the barley varieties, with Fathom having the highest degree of lodging with a score of 7.

Figure 4 shows the lodging in barley at harvest.

Grain Yield:

The average grain yield of this trial was 3.38 t/ha.

Yields in the trial ranged from 2.54 t/ha, for the wheat variety Emu Rock to 4.44 t/ha for the barley variety RGT Planet, figure 5.

Longer season varieties tended to perform well on the long fallow. RGT Planet, figure 6, was significantly higher yielding than most other varieties, with the exception of Kittyhawk, HV16, DS Pascal and Longsword. These varieties were also the only other varieties to yield over 4 t/ha.

Figure 2: Frost affected some plots at Rankins Springs, September 2017.



Figure 3: Rankins Springs Trial Establishment, June 2017.



Figure 4: Rankins Springs lodging of barley at harvest, November 2017.



Besides Emu Rock other varieties to yield less than 3 t/ha, and varieties which were statistically similar yielding to Emu Rock, were: Spitfire, LRPB Mustang, DBA Vittaroi, Corak, Bolac, Condo, LPB13-1995, LaTrobe, Sunmate and LRPB Reliant.

Grain Quality:

Grain protein, screenings and test weight were all measured in this trial and are shown in table 2.

Grain Protein: Grain protein ranged from 9.49%, for RGT Planet barley, up to 13.39% for the wheat variety Bolac. The average grain protein for this site was 10.99%.

The only other variety to have a grain protein above 13% was Spitfire. Whereas HV16, AGTD03, Aurora and Coolah were the only other varieties to have a grain protein less than 10%.

Screenings: The average screenings for this site was 0.85%, with screenings ranging from 0.267% for Sunvale up to 2.33% for the barley variety Hindmarsh.

Hindmarsh was significantly higher than all other varieties except the barley varieties LaTobe and Fathom.

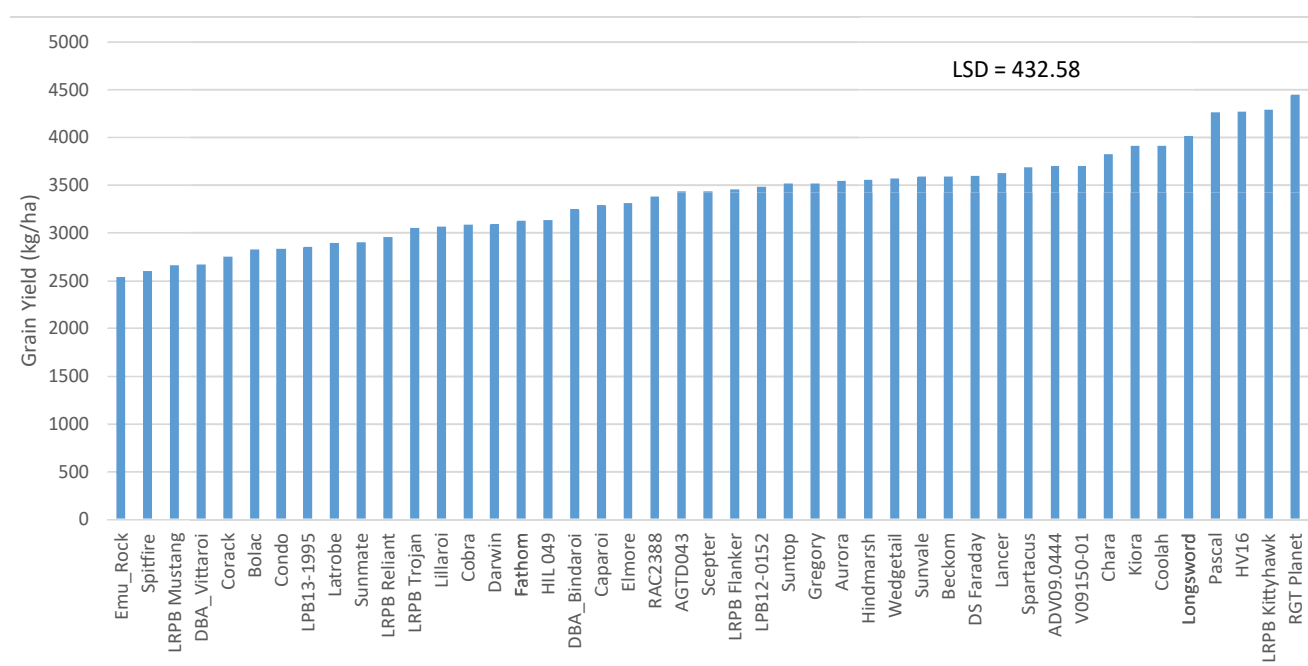
Test weight: Test weight ranged from 64.34 kg/HL for the barley variety Fathom to 83.4 kg/HL for Spitfire. The trial average test weight was 79.08 kg/HL.

The other barley varieties in the trial, including Hindmarsh, HV16, Spartacus, RGT Planet and LaTrobe also had test weights less than 70 kg/HL.

Figure 6: Rankins Springs highest yielding variety, RGT Planet Barley, at harvest, November 2017.



Figure 5: Rankins Springs dryland Yield Data 2017 (LSD 432.58 kg/ha)



Hillston

Establishment:

The same scale used at Rankins Springs was used to assess establishment at Hillston.

Establishment scores were taken 19th June, when the crop was around the 3 to 4 leaf stage, figure 7. The trial established well with establishment scores ranging from 7 to 9. The only varieties to have a score less than 8 were Caparoi, LaTrobe and Emu-Rock.

Lodging Scores:

Lodging scores were taken in October and again just before harvest, using the same scale as Rankins Springs, figure 9.

Lodging in October was minimal, with only a few varieties starting to lodge, figure 8. Lodging scores in October ranged from 0 to 4 for the wheat variety AGTD03.

At harvest more lodging occurred with lodging scores ranging from 0 to 8, with the variety AGTD03 again having the highest degree of lodging.

The only other varieties to have a lodging score above 5 were Lillaroi and LRPB_Reliant, with DBA_Bindaroi, Fathom and Hindmarsh having a lodging score of 4.

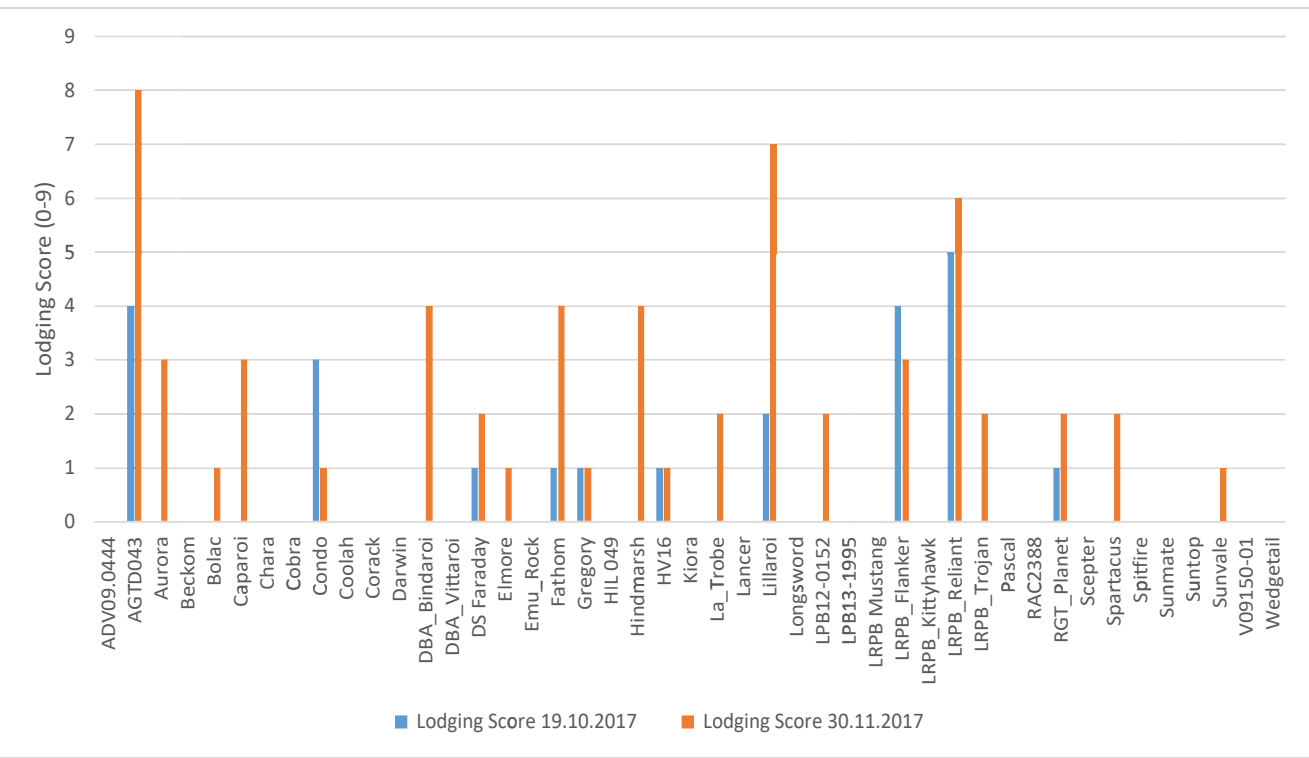
Figure 7: Hillston Establishment, June 2017.



Figure 8: Hillston lodging October, 2017.



Figure 9: Hillston Irrigated lodging scores October and November (Harvest) 2017



Grain Yield:

The average grain yield for Hillston was 7.61 t/ha. Yields in this trial ranged from 3.19 t/ha, for the the barley variety HV16, which was significantly lower than all other varieties except Spartacus, to 9.56 t/ha for the durum wheat variety DBA_Vittaroi, figure 10

Besides HV16 and Spartacus, the only other varieties to yield less than 5 t/ha were the barley varieties Hindmarsh and LaTrobe. Barley yields were lower than wheat in the trial as a lot of the barley heads were lost before harvest. The highest yielding barley variety was RGT Planet yielding 7.44 t/ha, which was still below the average trial yield.

The durum varieties Caparoi and DBA_Bindaroi were the only other varieties to yield over 9 t/ha. Figure 11 shows the harvest at Hillston.

Figure 11: Hillston harvest November, 2017.



Grain Quality:

The same grain quality measurements carried out at Rankins Springs were carried out at Hillston, table 2.

Grain protein: Grain protein ranged from 11.14%, for the wheat variety Coolah to 15.35% for the barley variety Hindmarsh. The average grain protein for this site was 12.51%.

The only other variety to have a grain protein above 15% was the barley variety Fathom, with Spartacus, Emu_Rock and LaTrobe all having proteins above 14%.

Screenings: The average screenings for this site was 1.56%, with screenings ranging from 0.439% for DBA_Vittaroi up to 8.017% for the barley variety Hindmarsh.

Hindmarsh was significantly higher than all other varieties, except HV16. Barley varieties, with the exception of RGT Planet, all had higher screenings than wheat.

Test weight: Test weight ranged from 70.02 kg/HL for the barley variety Fathom to 85.57 kg/HL for Bolac. The trial average test weight was 82.13 kg/HL.

The barley varieties in the trial had test weights around 70-71 kg/HL. The lowest test weight for wheat was for the variety V09150-01 which had a test weight of 80.3 kg/HL.

Figure 10: Hillston Irrigated Yield Data 2017 (LSD 1079.69 kg/ha)

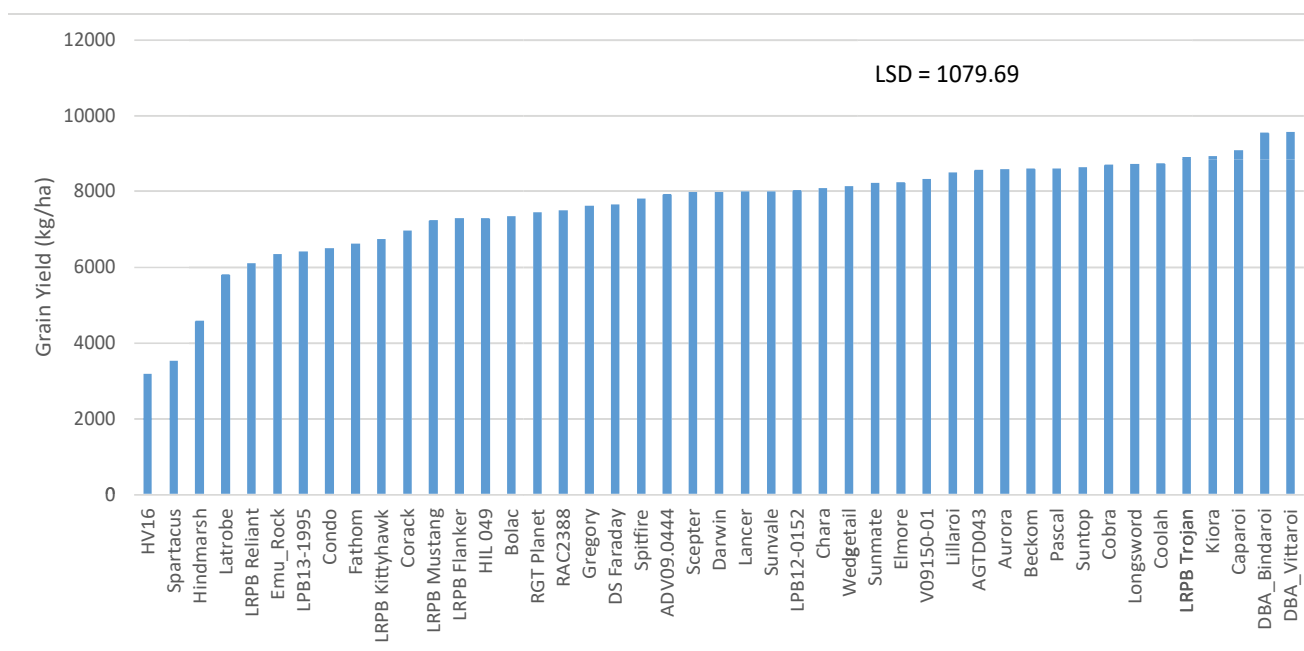


Table 2: Grain Protein (%), Screenings (%) and Test Weight (Kg/hL) for Rankins Springs and Hillston, 2017

VARIETY	RANKINS SPRINGS			HILLSTON		
	Protein %	Screening %	Test Weight kg/HL	Protein %	Screening %	Test Weight kg/HL
ADV09.0444	11.17	0.4998	78.33	12.22	0.831	82.33
AGTD043	9.64	0.7676	80.77	11.64	1.93	83.38
Aurora	9.82	1.7501	79.81	11.66	1.314	84.24
Beckom	11.12	0.444	80.5	12.08	1.148	84.04
Bolac	13.39	0.8704	82.93	13.94	0.716	85.57
Caparoi	10.53	0.8084	80.25	12.01	0.56	85.17
Chara	10.69	0.347	81.52	12.4	1.153	83.64
Cobra	12.74	0.4908	80.27	12.8	0.76	83.73
Condo	11.88	0.6011	81.72	13.19	0.841	84.72
Coolah	9.84	1.1237	80.8	11.14	0.957	83.92
Corack	12.57	0.662	82.22	12.74	0.742	83.75
Darwin	11.05	0.6562	80.9	12.19	0.829	84.97
DBA_Bindaroi	10.39	0.4924	82.58	12.72	0.658	85.14
DBA_Vittaroi	11.05	0.4528	82	12.81	0.439	83.72
DS Faraday	10.64	0.589	81.22	11.51	1.435	83.76
Elmore	10.92	0.4809	81.66	12.41	1.235	85.07
Emu_Rock	12.93	1.2333	80.45	14.24	1.586	81.62
Fathom	11.28	2.0336	64.34	15.1	3.283	70.02
Gregory	10.56	0.9283	81.54	11.49	0.942	84.83
HIL 049	11.47	0.7695	80.51	11.34	1.014	84.2
Hindmarsh	11.09	2.3395	65.96	15.35	8.017	70.66
HV16	9.51	1.5594	66.39	13.76	6.194	70.89
Kiora	10.14	0.8925	82.81	12.16	2.449	84.53
Lancer	11.65	0.5441	81.76	12.8	0.561	85.13
Latrobe	10.86	2.2684	67.27	14.02	2.805	71.19
Lillaroi	10.6	0.6447	78.9	13.34	0.951	83.08
Longsword	10.31	0.4975	80.7	12.06	1.308	83.53
LPB12-0152	10.34	0.9761	81.2	11.28	1.102	83.43
LPB13-1995	11.81	0.9125	79.61	12.44	1.787	83.55
LRPB Flanker	10.56	1.0275	79.86	11.68	0.965	84.76
LRPB Kittyhawk	10.46	0.4623	82.98	12.33	2.001	85.18
LRPB Mustang	12.29	0.6101	82.21	11.77	1.44	83.84
LRPB Reliant	10.88	1.176	80.1	12.1	1.428	83.17
LRPB Trojan	11.44	0.4153	82.53	12.01	1.82	83.41
Pascal	10.12	0.6639	82.11	11.74	1.442	83.07
RAC2388	10.71	0.7967	80.05	11.98	1.454	83.87
RGT Planet	9.49	0.6824	66.66	12.43	1.221	70.08
Scepter	10.63	0.8242	81.81	11.58	0.948	83.77
Spartacus	10.92	1.288	66.64	14.85	4.304	71.37
Spitfire	13.07	1.026	83.4	13.84	0.749	85.48
Sunmate	11.34	0.8477	81.01	11.85	1.166	83.93
Suntop	11.14	1.0817	81.96	11.61	1.652	84.19
Sunvale	10.65	0.2671	81.79	12.23	1.346	84.7
V09150-01	10.28	0.2682	77.78	11.98	1.222	80.3
Wedgetail	10.59	0.4071	78.74	12.36	0.652	81.08
Ave	10.99	0.8551	79.08	12.51	1.59	82.13
LSD (p=0.05)	0.637	0.579	1.593	0.5026	0.7463	0.965



2016

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Rankins Springs & Hillston

Figure 4: Rankins Springs lodging scores, (0 = no lodging, 9 = totally lodged), November 2016.

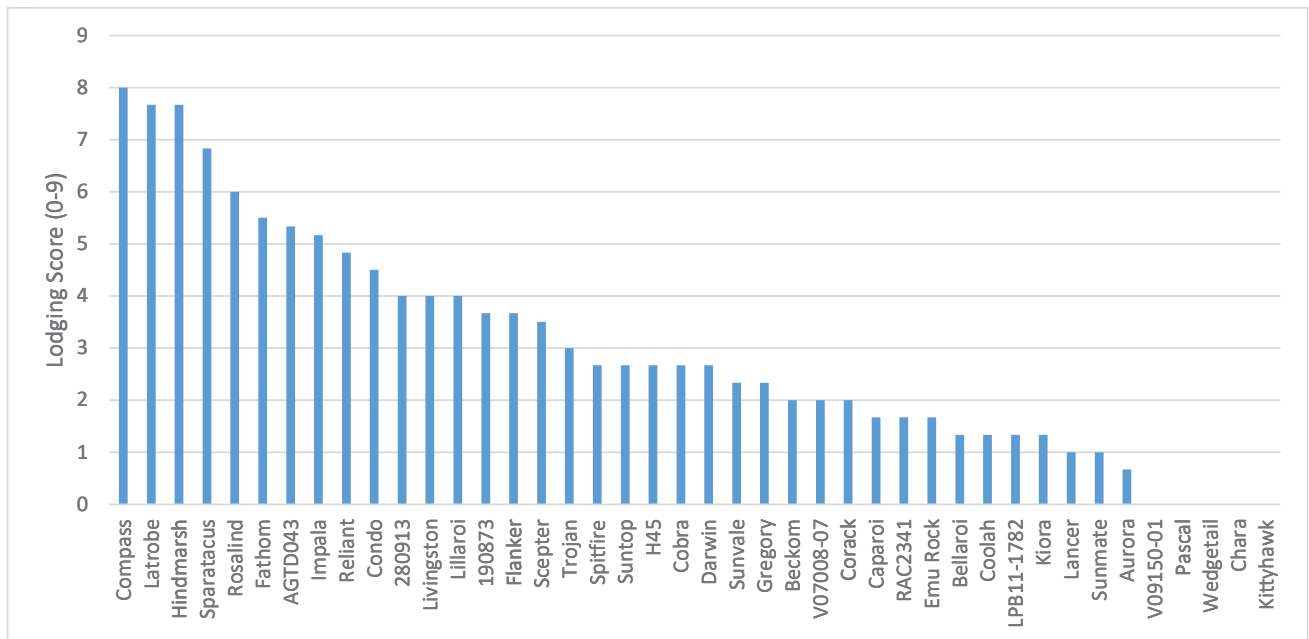


Figure 5: Rankins Springs dryland Yield Data 2016 (LSD 629 kg/ha)

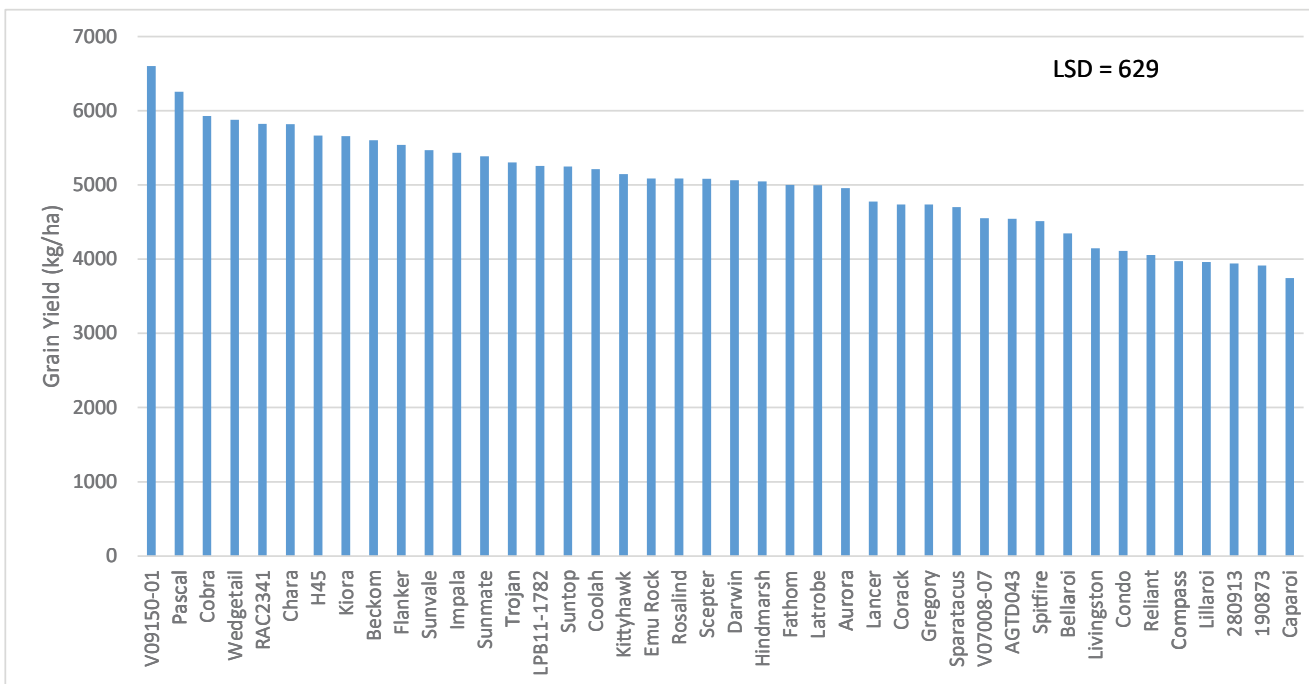


Figure 6: Hillston lodging scores, (0 = no lodging, 9 = totally lodged), November 2016.

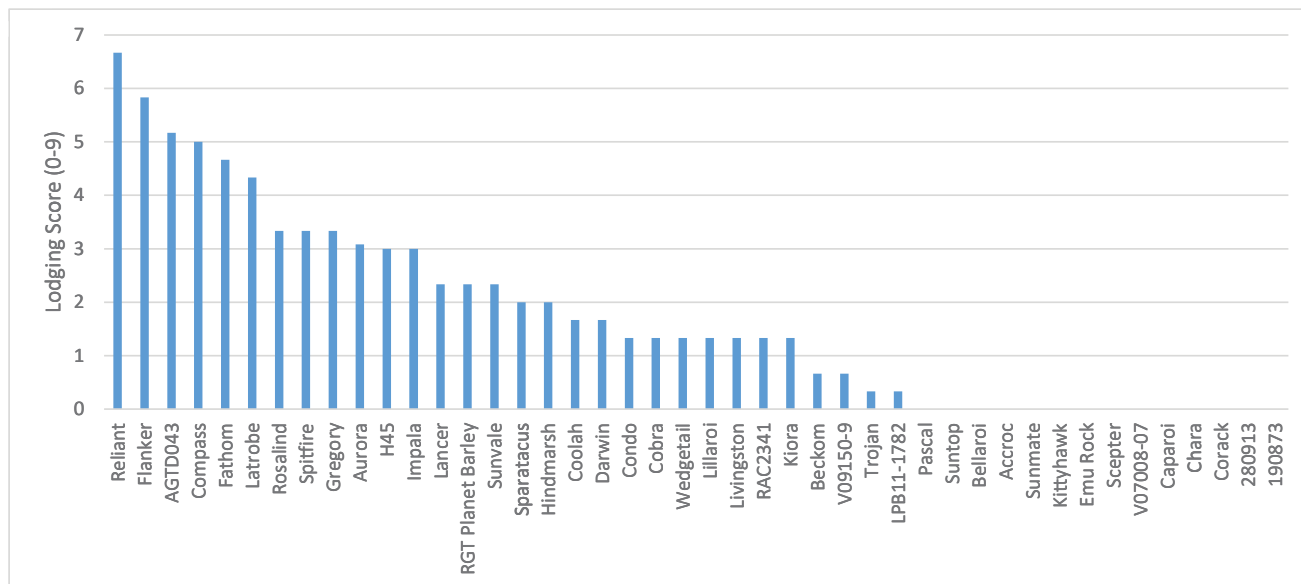
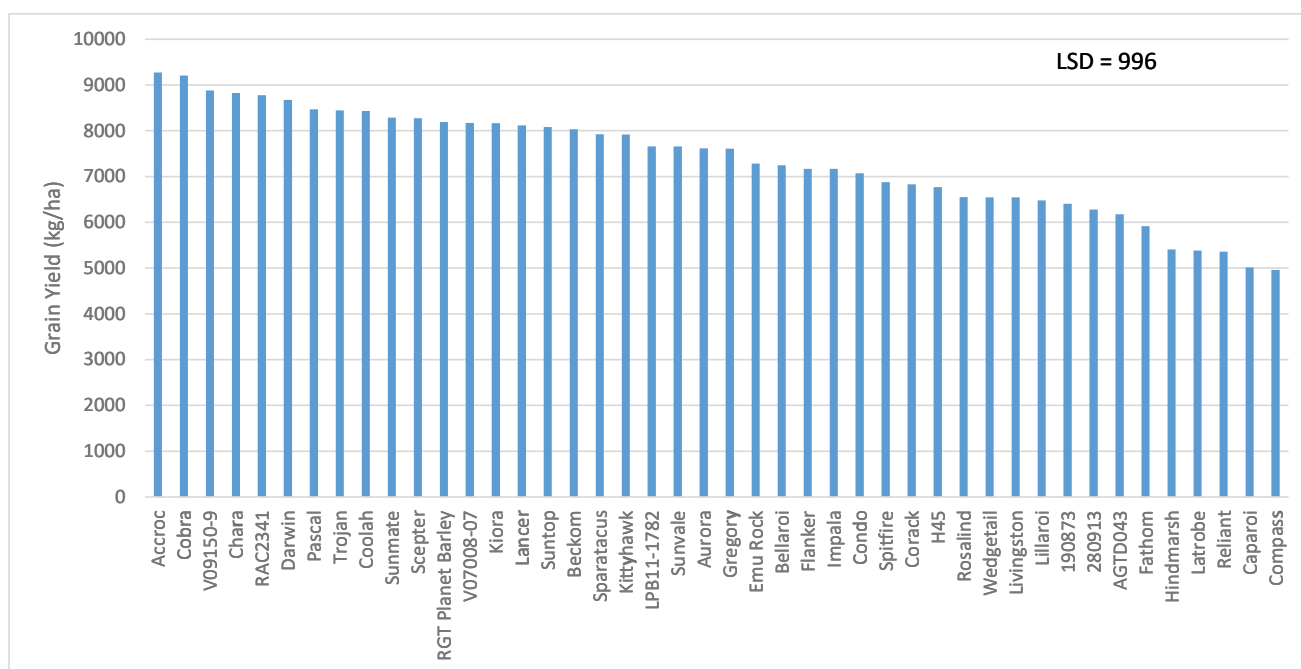


Figure 7: Hillston Irrigated Yield Data 2016 (LSD 996 kg/ha)



Ag Grow spring field day 2017 HBS Rankins Springs variety trial



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Further contacts

Barry Haskins	Ag Grow Agronomist	barry@aggrowagronomy.com.au
Rachael Whitworth	Ag Grow Research Manager	rachael@aggrowagronomy.com.au
Robert Hart	Hart Bros Seeds, Junee	robert@hbseeds.com.au