

Rural Finance Crop Challenge

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In the Rural Finance Crop Challenge teams of farmers, advisers, researchers and academics compete against one another to achieve the highest annual and 3-year rotational gross margin. The competition is hosted by Southern Farming Systems and sponsored by Rural Finance. The CSIRO and DPI Victoria are providing impartial monitoring of in season crop performance from each team as part of the GRDC Crop Sequencing project.

The choice of crop, sowing and in-crop management and marketing is at the discretion of each team. In 2011 a pulse had to be grown, any crop could be sown in 2012, and wheat must be sown in 2013. The Crop Challenge at Inverleigh was based on 10 teams from the east of the western districts and the Lake Bolac site featured 13 teams from the west of our region.



Table 1 below summarises the results from this three-year cycle of the competition. The annual winner at each site with the highest gross margin and the three-year rotational gross margin (right-hand column) is highlighted.

At Inverleigh, Could've Beans won in 2011, Capital Punishers in 2012 and Landmark in 2013. Landmark are the overall winners of the Rural Finance Crop Challenge at Inverleigh with a three-year gross margin of \$3399/ha.

At Lake Bolac the 2011 winners were the Nitrogen Fixators, The Legends were first in 2012 and Bean Machines took out the title in 2013. The overall winners of the rural finance Crop Challenge at Lake Bolac were the Nitrogen Fixators with a three-year gross margin of \$2440/ha.

Table 1. Summary of the crop and annual gross margin of each team in the Inverleigh and Lake Bolac challenge in 2011-13, as well as the three-year rotational gross margin. Winners are highlighted in green.

Inverleigh	2011		2012		2013		3 Yr Gross Margin
	Crop, Gross Margin (\$/ha)		Crop, Gross Margin (\$/ha)		Crop, Gross Margin (\$/ha)		
La Trobe	Faba bean	277	Canola	1295	Wheat	1403	2975
Capital Punishers	Faba bean	-376	Canola	1460	Wheat	1124	2208
Marcus Oldham	-	-	Canola	1006	Wheat	1548	2554
Could've Beans	Faba bean	653	Canola	1308	Wheat	1038	2999
Southern Stars	Faba bean	572	Canola	1079	Wheat	-249	1402
Landmark	Lupin	543	Canola	1003	Wheat	1853	3399
Germinators	Field pea	332	Canola	914	Wheat	774	2020
A Team	Field pea	-59	Wheat	1229	Wheat	-303	867
Go Hawks	Field pea	191	Canola	1105	Wheat	1120	2416
Pulsators	Field pea	113	Canola	945	Wheat	1040	2098
Lake Bolac	2011		2012		2013		3 Yr Gross Margin (\$/ha)
	Crop, Gross Margin (\$/ha)		Crop, Gross Margin (\$/ha)		Crop, Gross Margin (\$/ha)		
Bean Machines	Faba bean	24	Canola	960	Wheat	1338	2322
Southern Soils	Faba bean	-368	Canola	628	Wheat	462	722
Bald Hill Boys	Faba bean	287	Canola	821	Wheat	884	1992
Nitrogen Fixators	Faba bean	562	Canola	767	Wheat	1117	2440
NMIT	-	-	-	-	Wheat	271	271
Wickliffe Hillbillies	Lupin	103	Canola	1050	Wheat	1220	2373
SFS High Yelder	-	-	-	-	Wheat	-303	-303
Worn Out Farmers	Field pea	-154	Canola	228	Wheat	1247	1321
Break Breakers	Field pea	0	Canola ²	652	Wheat	1141	1793
Nuseed/Nufarm Cats	Faba bean	170	Canola	1032	Wheat	-300	902
The Insiders	-	-	Canola	67	Wheat	1253	1320
ElCo Pops	-	-	Canola	1127	Wheat	1033	2160
Legends	-	-	Wheat	1486	Wheat	765	721

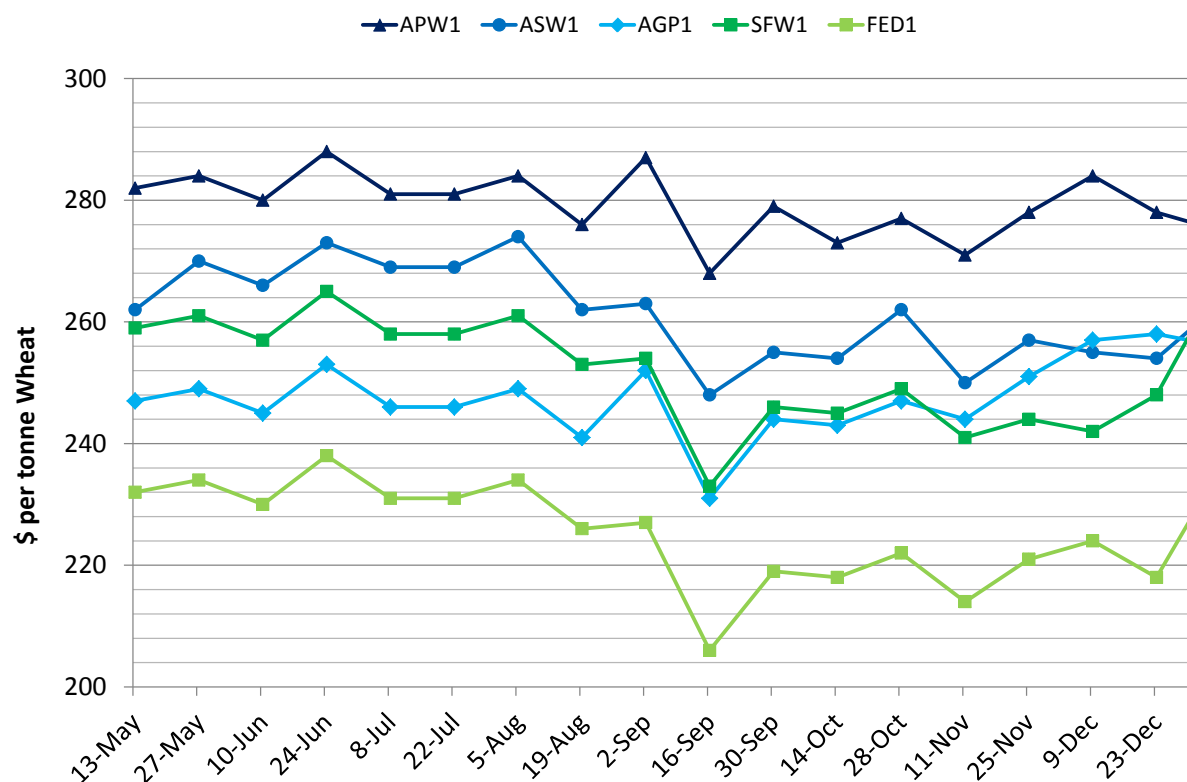


Figure 1. Grain price (\$/t) for wheat from the 13th of May until harvest on the 20th of January. Prices courtesy of Southern Quality Produce (SQP).

Inverleigh

Summary

Landmark are the winners of the Rural Finance Crop Challenge for 2013 at the Inverleigh site with the highest gross margin of \$1853/ha. The A Team and Southern Stars were last placed with negative gross margins due to total crop loss.

Table 2. Summary of the yield, cost of production and gross margin of the ten teams competing at Inverleigh in 2013. Teams are ranked by gross margin.

Rank	Team	Variety	Yield (t/ha)	Cost of Production (\$/t)	Gross margin (\$/ha)
1	Landmark	Revenue	7.38	54	1853
2	Marcus Oldham	Revenue	8.35	73	1548
3	La Trobe	Bolac	7.06	57	1403
4	Capital Punishers	Elmore CL Plus	5.64	93	1124
5	Go Hawks	Phantom	5.97	75	1120
6	Pulsators	Preston	6.21	69	1040
7	Could've Beans	Phantom	5.70	70	1038
8	Germinators	Beaufort	5.37	92	774
9	Southern Stars	Derrimut	-	-	-249
10	A Team	Revenue	-	-	-303

The key to the winning crop was to choose a high yielding variety, keep input costs low and take advantage of the ability to graze wheat for added income. The highest yielding variety was Revenue grown by Marcus Oldham at 8.35t/ha.

Low proteins across the board meant that milling wheats such as Bolac, Elmore and Phantom were downgraded with a subsequent drop in price. This would slightly change the rankings in the leaderboard but didn't affect the overall winner.

Forward grain marketing didn't play a role in the outcome of the competition although in some cases teams actually lost money.

Breakdown of inputs and their costs

The team captains supplied a worksheet at the start of the competition detailing variety choice, sowing rate, seed treatment and choice of sowing date as well as any seedbed fertiliser required and any herbicides to be incorporated by sowing or applied post sowing-pre emergence. Other pesticide and fertiliser decisions were received later in the season and carried out as instructed by the team captains. A breakdown of these costs during the season is shown in Table 3 below.

Table 3. Team costs analysis throughout the growing season. Note that Fixed Costs includes the cost of each sowing, fertilising, spraying and harvesting operation.

Team	Team La Trobe	Capital Punishers	Marcus Oldham	Could've Beans	Southern Stars	Landmark	Germinators	A Team	Go Hawks	Pulsators
Variety	Bolac	Elmore CL Plus	Revenue	Phantom	Derrimut	Revenue	Beaufort	Revenue	Phantom	Preston
Treated seed	81	86	95	72	99	90	90	90	77	90
Seedbed fertiliser	50	38	74	60	50	69	38	75	75	78
Pre-em herbicide	40	6	62	19	15	12	38	53	38	32
Post-em herbicide	15	1	9	8		9	25		3	30
Fungicide		22	7	7		14	16		2	
Insecticide			51							
Adjuvants	6	12	6				12		6	6
Fertiliser	66	220	127	75		55	111		81	55
Machinery					35			35		
Fixed costs	147	169	179	157	50	147	169	50	169	135
Total Cost (\$/ha)	404	553	607	397	249	395	497	303	450	426

Southern Stars and A Team had the lowest total costs of all teams because both had their crops slashed out due to failure to control broadleaf weeds with a post-emergent herbicide. Of the teams that took a crop to harvest, Capital Punishers, Marcus Oldham and Germinators spent the most on inputs; particularly fertiliser. For an illustration of dollars spent per tonne of crop see Figure 2 below.

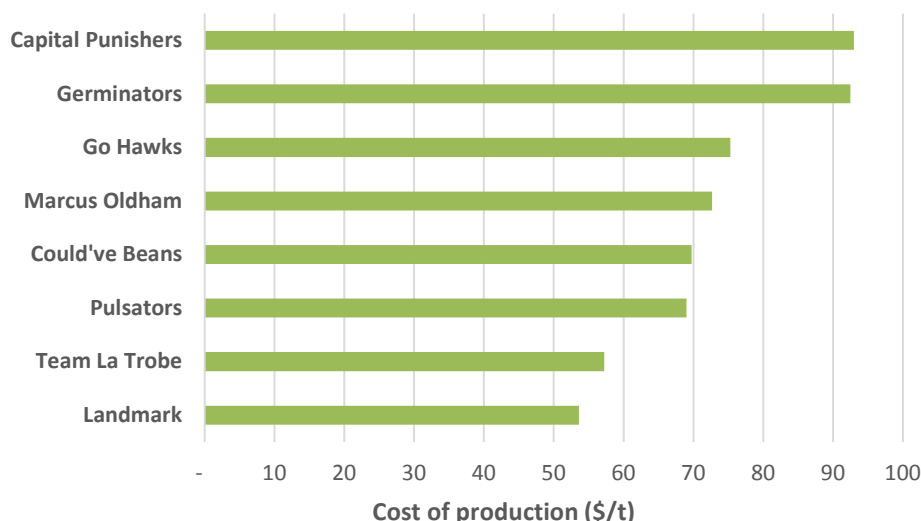


Figure 2. A comparison of the costs of production (\$/t) of the eight Inverleigh teams that took a crop to harvest.

Landmark and La Trobe had the lowest cost of production as they were able to dilute moderate input costs over high yields. Capital Punishers and Germinators were on the other end of the scale with high costs but the two lowest yields.

Sowing

In 2013 all teams had to grow wheat as the third crop in the rotation. Among the eight crops taken to yield were the feed wheats Revenue, Preston and Beaufort and the milling wheat Bolac. These four are old favourites in this region and are consistently among the top yielding varieties in SFS variety trials. In this year's crop challenge Revenue was best performing variety at both Inverleigh and Lake Bolac.

Could've Beans and Go Hawks sowed the new milling wheat Phantom while the Capital Punishers went for inter-tolerant milling wheat Elmore CL Plus. Phantom has the potential to yield highly at this site but has been constrained by nutrition in this year's challenge and suffered a 1-2 t/ha yield penalty compared to Revenue. Elmore CL Plus was previously untested at this site but returned a respectable 5.64t/ha yield.

Sowing dates ranged from mid-April to mid-May. The break came in the middle of May which meant that early knockdowns and pre-emergent herbicides failed to control the bulk of weeds that germinated in early-sown crops after the break. However, this was nothing new for the Inverleigh teams who are used to dealing with multiple germinations of wild radish in a season. Unfortunately for Southern Stars and A Team, failing to keep ahead of weeds caused total crop loss.

Some herbicide damage was observed by the Could've Beans in Phantom sown three weeks before the break when metolachlor was used as a pre-emergent herbicide. However, this didn't affect plant establishment significantly: Could've Beans sowed Phantom at 80kg/ha and achieved a plant population of 93pl/m² whereas Go Hawks sowed the same variety 5kg/ha higher and achieved a plant population of 118pl/m². The ideal sowing rate for Phantom is closer to 100kg/ha if you consider its thousand grain weight of 47 and a target plant population of 160pl/m². In fact, the only teams who achieved a low target plant population (under 160pl/m²) were the two who sowed lighter than recommended (Could've Beans and Go Hawks) and the two who were overrun by weeds and lost their crop (Southern Stars and A Team).

Nutrition

Early Autumn soil tests revealed quite high plant available N in the soil profile despite low levels of mineralisation over the dry 2013/13 summer. Total available N in the soil profile at this time ranged from 85 to 132 kg N/ha so there were reasonable levels of residual N at the start of the season. Despite this and the forecast for a bumper season, many teams seemed reluctant to go all-out on nitrogen and crop yields suffered as a result.

The majority of teams sowed with MAP and applied either urea or UAN in-crop. Applied N was typically between 50 and 100 kg/ha although the Capital Punishers went all out with close to 200kg N/ha applied in-crop in addition to what was in the soil. The Could've Beans and Go Hawks both applied a zinc product in addition to their nitrogen program but this doesn't seem to have been a factor in determining yield.

Figure 3 below shows the total nitrogen, both residual and applied, available to each team and the resulting yield and protein achieved. Generally speaking, yield increased as the available nitrogen increased but crop yields have evidently not reached potential because grain protein for most teams is hovering around 10% or worse.



Figure 3. Total nitrogen (residual and applied) available to the eight teams at Inverleigh that took a crop to harvest and the resulting wheat yield and grain protein of that team's variety.

The Capital Punishers' Elmore CL Plus clearly had almost a third higher nitrogen than all the other teams yet even they peaked at 11.1% protein, failing to reach the critical 12.5% protein required for H1 milling wheat. In fact all teams growing a milling variety were downgraded due to low protein to APW, ASW or AGP but the effect on the leaderboard was minor with Landmark still in first place. Table 4 below shows the target and actual quality grade achieved by each team.

Table 4. Target and actual wheat grade received by each of the eight Inverleigh teams that took a crop to harvest. Standards are in accordance with GTA Wheat Trading Standards 2013/2014.

Team	Variety	Target Grade	Actual Grade
Landmark	Revenue	SFW1	SFW1
Marcus Oldham	Revenue	SFW1	SFW1
La Trobe	Bolac	H1/H2	AGP1
Capital Punishers	Elmore CL Plus	H1/H2	APW1
Go Hawks	Phantom	H1/H2	ASW1
Pulsators	Preston	FED1	FED1
Could've Beans	Phantom	H1/H2	ASW1
Germinators	Beaufort	FED1	FED1

Although yield and not protein was the chief concern for those growing feed wheats, low proteins for these varieties again emphasises that crop yields were constrained by nutrition in what should have been a 'best ever' season.

Pesticides

Although slugs and *Septoria tritici* are an ever present threat in our region, 2013 proved to be a year where precious Crop Challenge dollars were better spent on weed control. Marcus Oldham were the only team to spend money on slug bait but this proved an unnecessary precaution. No other insecticides were applied. Seven out of the eight teams who took a crop to harvest applied fungicide; La Trobe were the only team who did not yet they sowed Bolac, rated MS, and had the third highest yielding crop.

Weed control was a key factor in determining yield, with two teams – Southern Stars and A Team – failing to apply any post-emergent herbicides and suffering total crop loss. Both teams have recorded a negative gross margin for 2013 and have had their plots slashed out prior to harvest to prevent seed set of wild radish and volunteer canola. The remaining eight teams spent between \$7 and \$71 on weed control, with much success. Capital Punishers were at the cheapest end of the scale with Logran B Power and Dual Gold pre-em and Velocity post-em. Marcus Oldham, on the other hand, spent the most on weed control with a pre-em consisting of Sakura, Avadex Xtra and Diuron and MCPA LVE post-emergent.

Grain marketing

The final option available to all teams was grain marketing. This option was open from sowing until harvest with prices emailed to team captains fortnightly.

All grain marketing quantities and decisions were based on a one hectare tonnage and were related to grain quality. For example, if their wheat yielded 6t/ha they had 6 t to market. There were two marketing mechanisms available for teams in 2013:

1. Spot price published on the day of harvest
2. Forward pricing based on 0.25t lots. If grain tonnages are oversold on the day of harvest teams would have to buy back the relevant tonnages at prices equivalent to (1).

The grades available for teams to aim for and market at were H1/H, APW1 ASW1, AGP1, SFW1 and FED1. The grade SFW1 was introduced this year to cater to Revenue red wheat and all teams growing this red wheat had their prices adjusted accordingly. Grading also took into account the change to a higher test weight for milling wheats that was applied by Grain Trade Australia for the 2013/14 harvest.

Prices in the 2013 season were fairly static but had a general downwards trend, with a sharp fall in mid-September and peaking at the start and end of the season (Figure 1). Only four teams at Inverleigh chose to forward sell grain in 2013, with little effect. Figure 4 below shows the gross margin of each team and the effect of forward marketing.

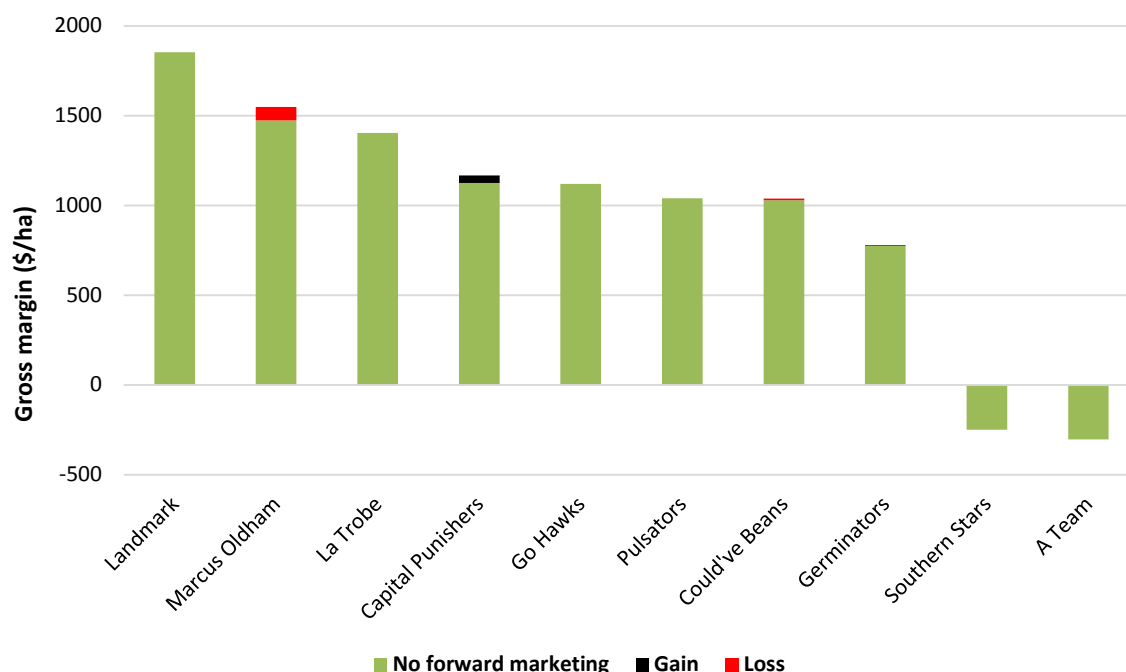


Figure 4. Gross margin per hectare and the loss or gain from forward marketing for all ten Inverleigh teams.

Capital Punishers and Marcus Oldham both had aggressive selling strategies, with both teams selling a total of 5t/ha during the season. Unfortunately this tactic had almost no impact on final gross margins, and while Capital Punishers earned an extra \$44/t, Marcus Oldham lost almost double that amount. The Could've Beans and Germinators both sold 2t early in the season when prices were high but again the effect on gross margin was negligible.

Lake Bolac

Summary

The Bean Machines are the winners of the Rural Finance Crop Challenge for 2013 at the Inverleigh site with the highest gross margin of \$1338/ha. Nuseed/Nufarm Cats and SFS High Yelder were placed last with negative gross margins due to total crop loss.

Table 5. Summary of the yield, cost of production and gross margin of the thirteen teams competing at Lake Bolac in 2013. Teams are ranked by gross margin.

Rank	Team	Variety	Yield (t/ha)	Cost of Production (\$/t)	Gross margin (\$/ha)
1	Bean Machines	Scout	6.30	63	1338
2	The Insiders	Revenue	6.98	80	1253
3	Worn Out Farmers	Revenue	7.17	70	1247
4	Wickliffe Hillbillies	Revenue	6.18	68	1220
5	Nitrogen Fixators	Phantom	5.64	83	1117
6	Break Breakers	Phantom	5.96	73	1141
7	Elco Pops	Revenue	5.43	76	1033
8	Bald Hill Boys	Phantom	5.06	88	884
9	The Legends	Preston	5.11	86	765
10	Southern Soils	Beaufort	3.7	111	462
11	NMIT	Bolac	2.27	144	271
12	Nuseed/Nufarm Cats	Derrimut			-300
13	SFS High Yelder	Elmore CL Plus			-303

The key to the winning crop was to keep input costs low and choose a high yielding variety. Generally, the higher the yield the higher the gross margin.

Low proteins across the board meant that milling wheats such as Scout, Phantom and Bolac were downgraded with a subsequent drop in price. This would slightly change the rankings in the leaderboard but didn't affect the overall winner.

In 2013 forward grain marketing didn't affect the majority of teams' gross margins but the Worn Out Farmers oversold grain and slipped from first place to third on the leaderboard.

Breakdown of inputs and their costs

The team captains supplied a worksheet at the start of the competition detailing variety choice, sowing rate, seed treatment and choice of sowing date as well as any seedbed fertiliser required and any herbicides to be incorporated by sowing or applied post sowing-pre emergence. Other pesticide and fertiliser decisions were received later in the season and carried out as instructed by the team captains. A breakdown of these costs during the season is shown in Table 6 below.

Table 6. Team costs analysis throughout the growing season. Note that Fixed Costs includes the cost of each sowing, fertilising, spraying and harvesting operation.

	Bean Machines	Southern Soils	Bald Hill Boys	Nitrogen Fixators	The Insiders	NMIT	Wickliffe Hillbillies
Variety	Scout	Beaufort	Phantom	Phantom	Revenue	Bolac	Revenue
Seed + Treatment	90	81	81	81	90	81	81
Seedbed fertiliser	63	66	63	38	38	69	63
Pre-em herbicide	56	57	61	33	57	45	41
Post-em herbicide		23	9	10	15		5
Fungicide			6	13	7		19
Insecticide							
Adjuvants	6	6	12	6	12	6	6
Fertiliser	50	33	60	104	158		60
Machinery							
Fixed costs	137	147	157	181	181	125	147
Total Cost (\$/ha)	395	412	447	466	557	326	422

	SFS High Yelder	Worn Out Farmers	Break Breakers	Nuseed/Nufarm Cats	ElCo Pops	Legends
Variety	Elmore CL Plus	Revenue	Phantom	Derrimut	Revenue	Preston
Seed + Treatment	90	86	81	68	85	90
Seedbed fertiliser	63	56	63	57	63	38
Pre-em herbicide		45	38	29	57	38
Post-em herbicide	30	3			6	
Fungicide	19	32	19			7
Insecticide						
Adjuvants	6	6	6		6	6
Fertiliser		100	90	50	50	100
Machinery	35			35		
Fixed costs	60	179	137	62	147	159
Total Cost (\$/ha)	303	502	433	300	413	437

SFS High Yelder and Nuseed/Nufarm Cats had the lowest total costs of all the teams because both had their crops slashed out due to their failure control ryegrass and volunteer canola with post-emergent herbicides. Of the remaining 11 teams that took a crop to harvest, The Insiders, Worn out Farmers and Nitrogen Fixators had the highest total costs due to fertiliser inputs and a greater number of separate fertilising and spraying operations. Among the Lake Bolac teams there was little variation in total costs but quite a large range in costs of production due to yield differences. For an illustration of dollars spent per tonne of crop see Figure 5.



Figure 5. A comparison of the costs of production (\$/t) of the eleven Lake Bolac teams that took a crop to harvest.

NMIT and Southern Soils were the two lowest yielding teams, resulting in the highest costs of production as their input costs couldn't be diluted over a larger tonnage. Of the eleven teams to harvest a crop, they were two lowest gross margins. At the other end of the scale the competition winners Bean Machines had the lowest cost of production at \$63/t.

Sowing

As at Inverleigh, all teams had to grow wheat at Lake Bolac in 2013 as the third crop in the rotation. The eleven teams who took a crop to harvest sowed a variety of feed and milling wheats: Revenue, Beaufort, Preston, Scout and Phantom. The new milling variety Phantom was a popular choice again but again we haven't seen it reach yield potential. SFS High Yielder sowed the shorter season Elmore CL Plus but the decision to rely on post-emergent herbicide chemistry alone saw their crop overrun with ryegrass weeds.

Sowing dates ranged from late April to the end of June. The late break caused more havoc at Lake Bolac than Inverleigh, with multiple-resistant ryegrass germinating in crop and demanding a rigorous herbicide program. Thankfully most teams were able to limit crop loss due to weeds, apart from SFS High Yielder and Nuseed/Nufarm Cats who ended up with total crop loss.

Adequate sowing rates ensured mostly good plant populations at the Lake Bolac site with the exception of NMIT and Nuseed/Nufarm Cats who had issues with early weed competition.

Nutrition

Deep soil nitrogen tests at Lake Bolac revealed a similar story to Inverleigh, with relatively high plant available N in spite of the dry summer. Same again was the trend towards conservative nitrogen application despite predictions for a favourable season, with the result being constrained yields.

MAP was once again the starter fertiliser of choice and urea was the top pick for in-season application. The Insiders spent the most on fertiliser application with 145kg N/ha going out in-crop. The Nitrogen Fixators, Worn Out Farmers, Break Breakers and Legends were the other four teams not afraid to splash out on fertiliser but still yields were not what they could have been. Southern Soils once again applied their custom biological products but the resulting yield of only 3.7t/ha was disappointing.

Figure 6 below shows the total nitrogen, both residual and applied, available to each team and the resulting yield and protein achieved. The same trend was visible at both Inverleigh and Lake Bolac with yields generally increasing as the available nitrogen increased, but crop yields of both feed and milling varieties were obviously lower than their potential as indicated by low grain protein.

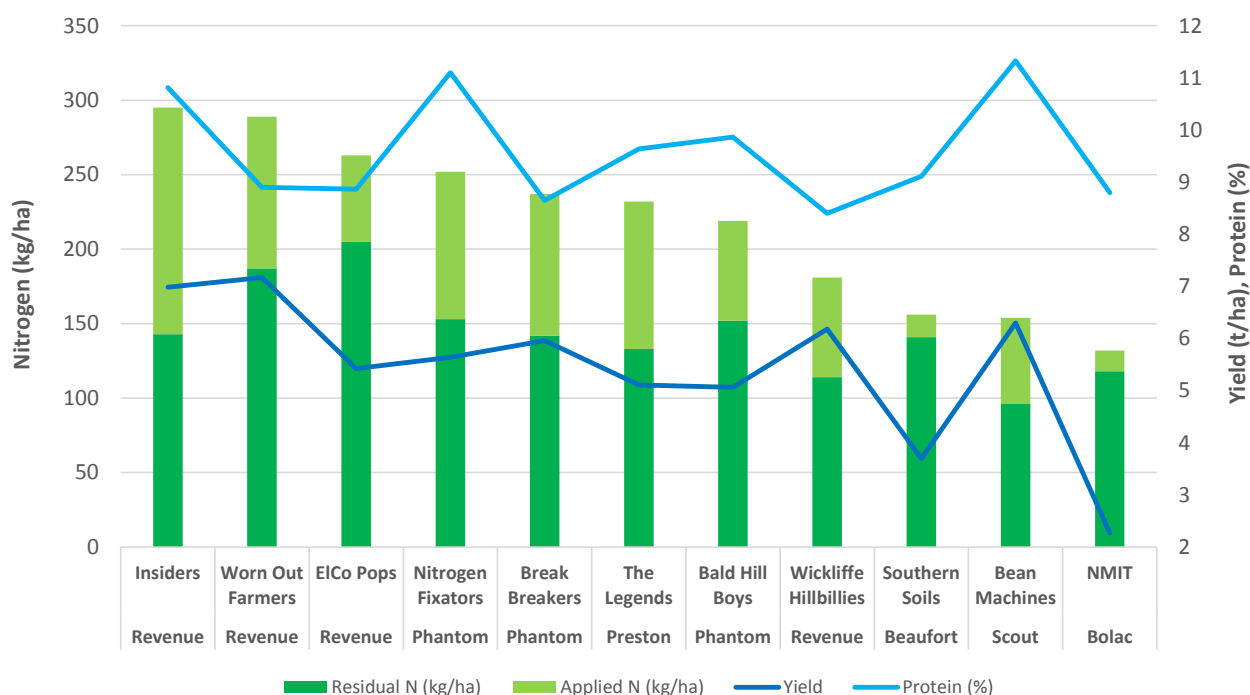


Figure 6. Total nitrogen (residual and applied) available to the eleven teams at Lake Bolac that took a crop to harvest and the resulting wheat yield and grain protein of that team's variety.

The two teams who subsoil manured in 2012, The Insiders and Worn Out Farmers, did not have significantly better residual soil fertility compared to the other teams. Those teams with the highest residual N and other nutrients at the start of 2013 were those who over-applied high levels of fertiliser during the previous season.

It is interesting to note that Bean Machines and The Insiders, placed first and second on the leader board, are at opposite ends of this figure. Whereas The Insiders spent a lot on fertiliser and got a high return on their feed variety, Bean Machines were conservative in their spending and had a moderate yield which translated to a higher gross margin.

The highest proteins were achieved by Bean Machines and Nitrogen Fixators – 11.3% and 11.1%, respectively – which meant that they failed to achieve H1/H2 grade. As at Inverleigh, all milling wheat varieties were downgraded due to low protein (see Table 7 below) and fetched a lower price.

Table 7. Target and actual wheat grade received by each of the eleven Lake Bolac teams that took a crop to harvest. Standards are in accordance with GTA Wheat Trading Standards 2013/2014.

Team	Variety	Target Grade	Actual Grade
Bean Machines	Scout	H1/H2	APW1
The Insiders	Revenue	SFW1	SFW1
Worn Out Farmers	Revenue	SFW1	SFW1
Wickliffe Hillbillies	Revenue	SFW1	SFW1
Nitrogen Fixators	Phantom	H1/H2	APW1
Break Breakers	Phantom	H1/H2	ASW1
Elco Pops	Revenue	SFW1	SFW1
Bald Hill Boys	Phantom	H1/H2	ASW1
The Legends	Preston	FED1	FED1
Southern Soils	Beaufort	FED1	FED1
NMIT	Bolac	H1/H2	ASW1

Despite the fact that milling wheats were downgraded across the board, there was little effect on the overall ranking of the teams and Bean Machines remained in first place.

Pesticides

Weeds continue to be the key issue at Lake Bolac and the dry start to the season meant that most teams had issues with ryegrass and volunteer canola from the previous season. SFS High Yielder underestimated the weed burden

at the Lake Bolac site and their strategy of using a Clearfield wheat and post-emergent herbicides only was fraught with disaster. Their crop and that of Nuseed/Nufarm Cats was overrun with weeds and slashed out. Although NMIT also failed to apply any post-emergent herbicides their plots appeared viable and were taken to harvest. The results was a crop that was half ryegrass and half wheat and a disappointing yield of 2.27t/ha.

Bean Machines and Break Breakers were fortunate in that they didn't need any post emergent weed control to preserve their crop yields. Sowing two weeks after the break, pre-ems with residual effect and a legacy of reasonable weed control helped keep their plots relatively weed free until crop competition could take over.

Most of the teams at Lake Bolac applied a fungicide but those that didn't weren't penalised with disease. Insecticides were not used or needed, with nary a slug sighted. Money saved on these inputs went a long way towards keeping the costs of production low.

Grain marketing

The final option available to all teams was grain marketing. This option was open from sowing until harvest with prices emailed to team captains fortnightly.

All grain marketing quantities and decisions were based on a one hectare tonnage and were related to grain quality. For example, if their wheat yielded 6t/ha they had 6 t to market. There were two marketing mechanisms available for teams in 2013:

Spot price published on the day of harvest

Forward pricing based on 0.25t lots. If grain tonnages are oversold on the day of harvest teams would have to buy back the relevant tonnages at prices equivalent to (1).

The grades available for teams to aim for and market at were H1/H, APW1 ASW1, AGP1, SFW1 and FED1. The grade SFW1 was introduced this year to cater to Revenue red wheat and all teams growing this red wheat had their prices adjusted accordingly. Grading also took into account the change to a higher test weight for milling wheats that was applied by Grain Trade Australia for the 2013/14 harvest.

Prices in the 2013 season were fairly static but had a general downwards trend, with a sharp fall in mid-September and peaking at the start and end of the season (Figure 1). Just over half the teams at Lake Bolac chose to market some or all of their crop but there was little impact on gross margins. Figure 7 below shows the gross margin of each team and the effect of forward marketing.

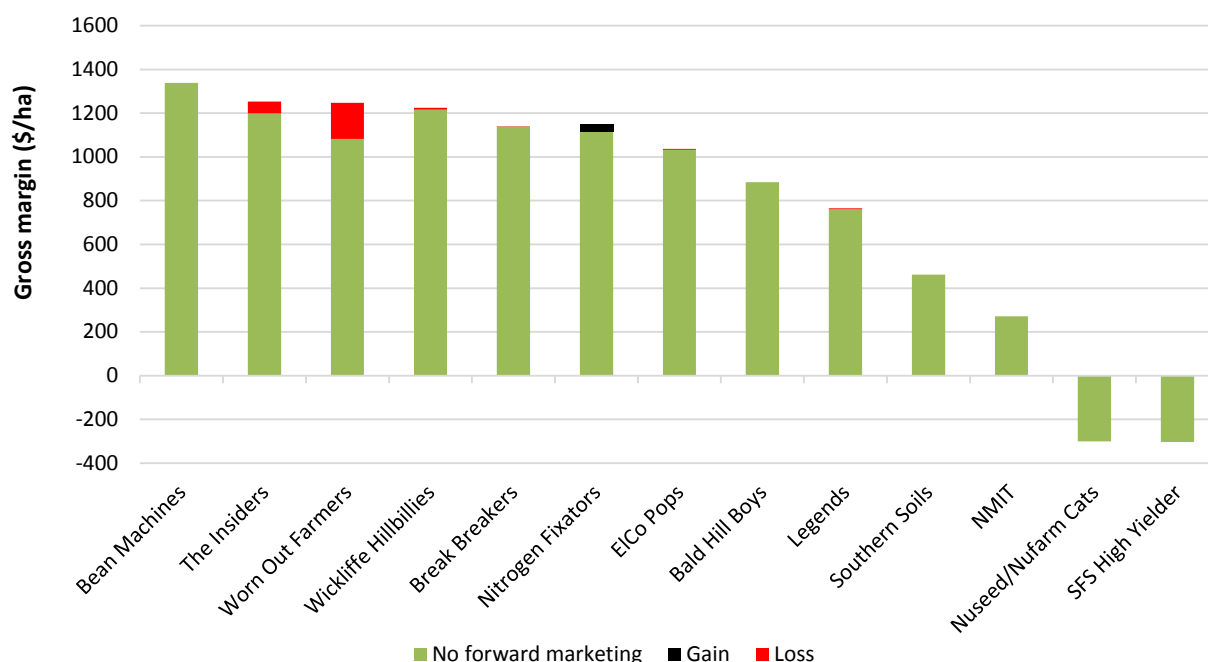


Figure 7. Gross margin per hectare and the loss or gain from forward marketing for all thirteen Lake Bolac teams.

Most teams who participated in forward selling sold 1-2 t/ha once during the season and took the spot price on the day of harvest for the remaining portion of their grain, with marginal negative impacts (or in the case of the Nitrogen Fixators, improvements) to gross margin. The Worn Out Farmers were more adventurous with their selling but unfortunately oversold their final yield by 0.83t/ha, causing them to lose \$165 from their gross margin. Without this forward sales misadventure they would have been in first place on the leaderboard; as a result they slip to third place.