


What Happened To Very Early Sown Cereals at Minnipa?

RESEARCH

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Searching for answers

Location:
Minnipa Ag Centre

Rainfall
Av. Annual: 325 mm
Av. GSR: 242 mm
2009 Total: 421 mm
2009 GSR: 333 mm

Yield
Potential: 5.2 t/ha (W)
Actual: 4.4 t/ha (W)

Paddock History
2008: Wheat
2007: Canola
2006: Wheat

Soil Type
Sandy clay loam

Diseases
Net form of net blotch in barley

Plot size
10 m x 1.5 m x 4 reps

having a good profile of moisture in March and April. This rainfall has germinated weeds and self sown cereals but also allowed the opportunity to store moisture for the coming winter crop. Having moisture at that time of the year begs the question, what would happen if a commercial cereal crop was sown at such an early date?

The drought years of 2006 and 2007 both had excellent rainfall events during March and April. In 2006, MAC received 50 mm in March, followed with 20 mm in April. March of 2007 delivered 62 mm, followed up by 40 mm in April. If these rainfall events had been used to seed a paddock or two, how would they have performed?

In 2006 the MAC farm broadcast wheat for stock feed on the March rainfall, which produced a successful pasture. Sheep struggled to keep up with the growth of the wheat, which eventually went through to head emergence before the paddock was slashed to allow for further grazing. After the crop was slashed, the season came in hot and dry. Perhaps this early sown crop could have been one of the better results on the farm, had it been managed as a grain crop.

When MAC received 19 mm in early March in 2009, followed up by 38 mm a week later, two enterprising researchers mustered enthusiasm and equipment for starting seeding a little early.

How was it done?

The trial was no-tilled into very light wheat stubble using small plot equipment. There were three times of sowing (TOS); very early (16 March), early (24 April) and

late (2 June). It was decided to use varieties which may best suit the opportunity as well as very early varieties as a contrast. Short season varieties Axe and Gladius were used as well as medium maturity Wyalkatchem. Longer season varieties used were Yitpi and Napperoo, which is a dual purpose wheat typically grown for grazing and grain in the high rainfall zones of NSW. Barque and Maritime barley were also included. All varieties were sown for a target germination of 180 plants/m², except the treatment Wyalkatchem low seeding rate (LSR), which was sown for a plant population of 90 plants/m². The plots were sown with 30 kg/ha DAP, deep banded below the seed.

The March sown plots were sown into excellent moisture conditions, however the temperature was rising rapidly after sowing. The April sown plots were sown into marginal moisture conditions, except it was still raining at the time. Excellent moisture conditions were present for the June seeding date.

What happened?

Within days of the March sowing date, the daily maximum temperature exceeded 30°C, which quickly dried out the soil surface. As a consequence the March germination was patchy with the barley giving the best establishment. The April sown plots established better, with the June sown plots establishing best.

On 30 April Axe, which had germinated in March, were already at head emergence, only 6 weeks after planting.

Key messages

- Early to mid season wheat varieties (Axe, Gladius and Wyalkatchem) sown in March yielded less than May and June sown crops.
- A mid to late season wheat variety (Yitpi) and two barley varieties (Barque and Maritime) produced similar yields from a March and April sowing.
- The earlier the sowing the later maturing variety and vica versa.

Why do the trial?

In three of the last four seasons many growers have been presented with the dilemma of

Table 1 Time of sowing vs grain yield and quality, averaged across all cereal lines

Time of Sowing	Grain Yield (t/ha)	1000 grain weight (g)	Protein (%)	Screenings (%)	Test Weight (kg/hL)
March	2.94	43.6	11.9	1.4	77.1
April	3.8	44.0	12.0	1.6	77.2
June	3.43	40.6	12.4	3.7	76.0
LSD ($P=0.05$)	0.15	0.7	0.2	0.6	0.6

Table 2 Variety x time of sowing vs grain yield, quality and gross income

Variety	Time of Sowing	Yield (t/ha)	1000 grain weight (g)	Protein (%)	Screenings (%)	Test Weight (kg/hL)	Gross Income (\$/ha)
Axe	March	1.63	43.9	12.4	0.7	80.6	331
Axe	April	3.44	45.9	12.2	0.3	80.2	699
Axe	June	3.82	46.3	11.7	0.4	82.6	776
Gladius	March	2.89	47.3	12.2	0.6	79.8	586
Gladius	April	4.13	47.7	12.0	0.5	80.5	839
Gladius	June	4.20	45.6	12.4	0.7	80.5	853
Naperoo	March	2.59	35.0	12.0	2.8	76.0	350
Naperoo	April	2.79	35.3	12.5	2.6	76.2	377
Naperoo	June	2.50	28.1	13.9	7.2	73.4	337
Wyalkatchem	March	2.70	46.7	11.0	0.6	82.0	516
Wyalkatchem	April	4.41	47.5	10.7	0.4	81.8	842
Wyalkatchem	June	3.72	44.7	10.9	0.5	81.4	711
Wyalkatchem LSR	March	2.22	47.5	11.3	0.6	81.6	423
Wyalkatchem LSR	April	4.08	47.4	10.6	0.5	82.7	780
Wyalkatchem LSR	June	3.46	44.4	11.1	0.5	81.6	661
Yitpi	March	4.24	43.4	11.3	1.2	81.5	810
Yitpi	April	4.37	43.7	11.9	1.1	82.1	887
Yitpi	June	3.86	41.8	12.8	0.8	80.2	783
Barque	March	3.64	42.1	12.5	2.5	67.4	419
Barque	April	3.84	43.7	12.7	2.7	66.9	441
Barque	June	2.98	37.7	13.2	9.0	64.4	343
Maritime	March	3.64	43.0	12.4	2.2	67.7	419
Maritime	April	3.31	40.7	13.3	4.3	66.8	380
Maritime	June	2.91	36.2	13.3	10.4	63.9	334
LSD ($P=0.05$)		0.41	2.0	0.5	1.8	1.8	

Maritime barley was effected with the onset of net form of net blotch and fungicide applied but possibly too late to fully recover potential grain yield.

The earlier maturing wheat lines (Axe, Gladius and Wyalkatchem) produced lower yields following the March TOS compared to the April and June TOS. Wyalkatchem and Yitpi produced higher yields with the April sowing than the June sowing. Yitpi and Naperoo produced similar yields from the March and April sowing dates with Naperoo yields lower than other varieties. The June sowing date produced the lowest 1000 grain weight and test weight but the highest grain protein and screenings.

The barley varieties yielded more from the March and April sowings than the June sowing. Maritime possibly because it was sufficiently advanced in its development by the time net form of net blotch hit that it was less affected than in the later sowing dates. The 10% screenings in the late TOS for Maritime indicates that the disease was well established in that situation.

Although grain yields between the Wyalkatchem sowing rates at any of the sowing dates were similar, the gross income was 10% higher with the higher sowing rate. The highest gross income for each variety was achieved at the April sowing date in most cases, except

for Maritime barley, which had the highest gross income from the March sowing.

What does this mean?

In 2009 there was a disadvantage from early to mid-season wheat varieties in mid March but not the later season varieties. Sowing during March presents many challenges as March and April can be very hot months leading up to the break of the season. Wheat growing under good moisture sown in March with warm weather is likely to grow very rapidly, which will increase frost risk from bringing the flowering window earlier.

This rapid early growth however is of great advantage if you can keep up to the growth with grazing, as a management option to consider. Another problem that early sown cereals present is that if they were to be used for hay, cutting may need to be done in August, which may make drying the hay a challenge. Early sown crops can also be an excellent source of host material for cereal rusts, as can self sown cereals. The most reliable end use for a very early sown crop is as a grazing proposition with the potential for grain or hay recovery if the season permits. See the "Responsive Farming Using Wheat Agronomy" article in this book for further information.

The risks associated with very early sown crops may be too many

to consider a viable proposition; however Bob Holloway's best wheat crop at Minnipa was achieved through sowing well outside the traditional sowing window. This was in 1991 when Molineux wheat was sown on 4 April. The final grain yield was 3.74 t/ha which was significantly more than the farm average that year of 2.95 t/ha.

Another experience of Bob's with early sown wheat highlights the importance of variety choice when choosing to sow very early. Shrike and Rosella wheat were sown on 1 March one year. Shrike was the highest yielder on the farm with 2.8 t/ha, however Rosella was out in head during June and subsequently eaten by galahs and was not harvested.

The experience of Bob Holloway at MAC, and with Yitpi in this trial suggest that the concept of very early sown crops has some merit, however it comes with associated risks which require further investigation.

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