

UNFS Time of Sowing Trial

Key Messages

- Slow maturing varieties sown early have potential to increase profitability, even in low rainfall areas.
- The late break to the season in 2012 in the UN, did not allow the long season variety to perform
- Dry sowing of wheat 5 weeks before the opening rains produced equal or higher yields to wheat sown on the break.

Why do the Trial?

The benefits of early sowing have been clearly demonstrated over the last few seasons with the early sown crops tending to yield the best and later sown crops performing poorly. Work conducted by James Hunt, CSIRO as part of the National Water Use Efficiency Initiative has shown that earlier sowing increases the frequency of planting opportunities, and allows more crop to be sown and flower on time. Modelling has shown the potential to increase average farm yield by 47% at Morchard (Table 1). Early sown crops yield more because less water is lost to evaporation, roots grow deeper, water is converted to dry-matter more efficiently and a longer stem elongation phase increases grain number. However, vegetative growth can be excessive, and early sown crops require specific genotypes and management to maximize reproductive growth, harvest index and grain yield. The use of long season slow maturing varieties may overcome this problem. The CSIRO believe the practice of sowing slow maturing varieties very early, could be applicable to approximately 30% of individual farm area, which is sufficiently free of grass weeds to allow early sowing.

Table 1. Including a slow maturing wheat variety in a farm program that allows early sowing, increases average farm yield and reduces risk. Results are from APSIM simulation 1962-2011 with a frost & heat multiplier for yield and assume a farm wheat program takes 20 days to plant. (J Hunt, CSIRO)

Strategy	1. Mid-fast varieties only – sowing window opens 5 May		2. Very slow + mid-fast variety – sowing window opens 10 April				
	Average farm wheat yield (t/ha)	Paddock yields <1.0 t/ha (%)	Average farm wheat yield (t/ha)	Paddock yields <1.0 t/ha (%)	Average farm wheat yield increase (%)	Years in which very slow variety planted (%)	Average area of very slow variety planted (%)
Location							
Condobolin	1.5	48%	2.2	34%	42%	71%	59%
Morchard	1.6	44%	2.3	32%	47%	29%	19%

How was it done?

In 2012 the UNFS attempted to validate this early work conducted by the CSIRO. Seed of a long season variety Eaglehawk was sourced. This variety is Prime Hard Quality in NSW and so would be AH in SA.

The aim was to conduct a time of sowing trial using three varieties at three times of sowing:- an early maturing variety (Axe), mid season maturing (Frame) and late maturing (Eaglehawk). Ideally the three sowing times were to be 1) mid April 2) early to mid May and 3) early to mid June.

Location: Ian Ellery, Coomoroo Vale Average annual rainfall 312 mm
 2012 Annual Rainfall 226 mm Growing Season Rainfall 115.5 mm
 Site sprayed with 30gm Logran and 1.2lt/ha glyphosate on 12th April
 Sown with a Shearer disc seeder using 18 cm row spacing.
 Fertiliser DAP at 50 kg/ha

Variety	1,000 grain weight	Target Plant Density per m ²	Seeding Rate kg/ha
Eaglehawk	36	140	60
	36	100	40
Axe	36	140	60
Frame	40.5	140	66

Time of sowing

	Date	Comments
Time 1	20 th April	Dry sown with forecast rain over the following few days, however only 2mm was received and plots failed to germinate
Time 2	5 th June	Sown 10 days after 9 mm of rain, which germinated the first time of sowing
Time 3	25 th July	Sown after further rain of 34mm in mid July.

What happened?

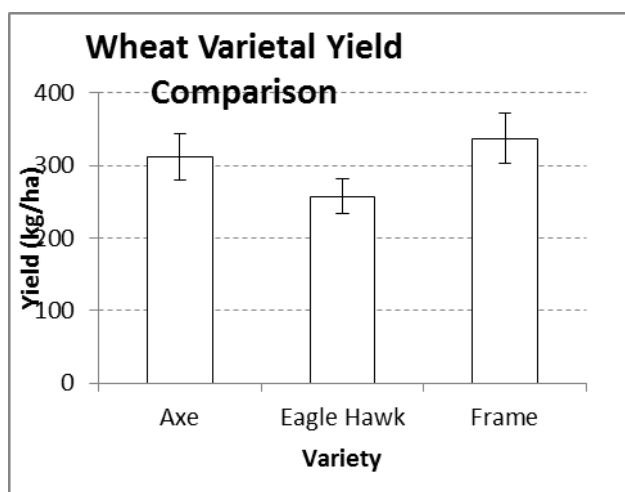


Figure 1: Yield of wheat varieties averaged over the three times of sowing

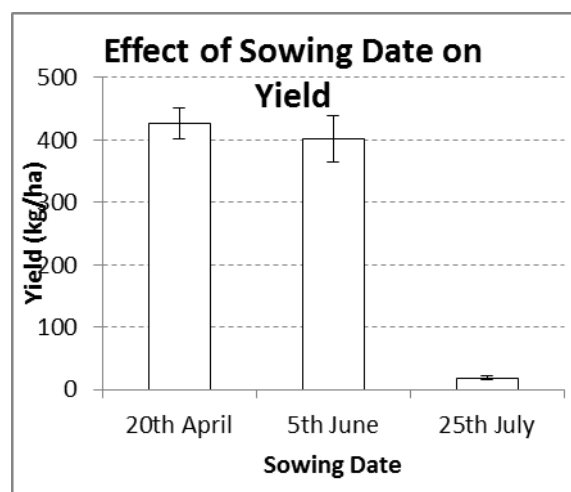


Figure 2: Wheat yield at three times of sowing averaged over the three varieties

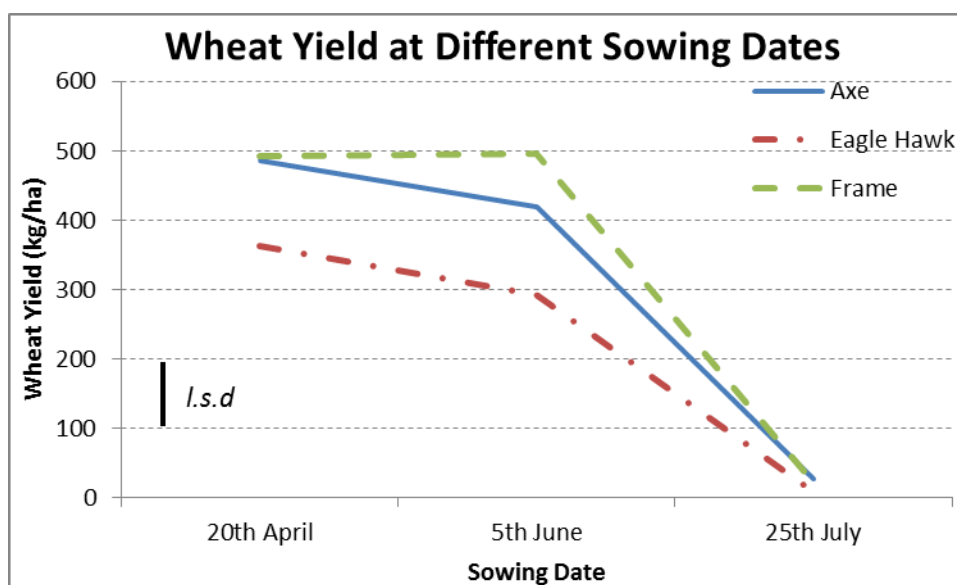


Figure 3: Wheat yield of three varieties at different sowing times

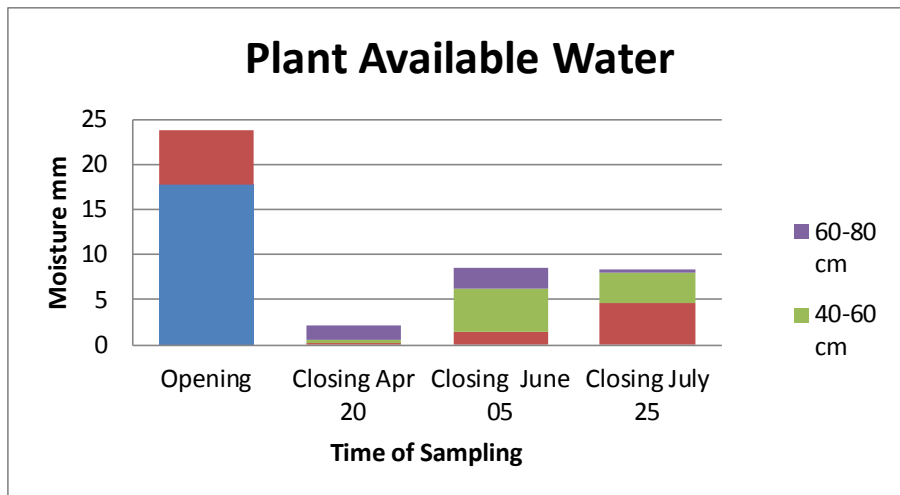


Figure 4: Impact of time of sowing on water use: “Opening” soil sampled April 20th; “Closing” soil sampled January, 2013

What does this mean?

The opportunity to see the benefits of early sowing (mid April) was not achieved, due to the later than ideal opening to the season. Cold conditions during July slowed growth, particularly of the late sown treatments as the dry spring did not allow them to recover and yield potential was poor.

The trial did however demonstrate the benefits of dry sowing. The first time of sowing (20th April) was sown dry following the application of Logran® and glyphosate to control summer weeds and despite forecast rain, insufficient was received to enable germination. The seed remained in the ground until reasonable falls were received between the 24th and 27th May, which germinated the grain. The second time of sowing was delayed so that there would be a reasonable time difference between the emergence of the first and second time of sowing. Despite there only being slightly over a week difference in the time of emergence the dry sown plots grew quicker and had a significant advantage over the second time of sowing. With the dry conditions in spring this advantage disappeared and the final yield advantage was relatively small and not significant (Figure 4). There was some varietal difference with the dry sown Axe and Eaglehawk yielding slightly higher, however this was not significantly different from the second time of sowing.

With the dry conditions in September and October, many of the plants in the late sown plots died and most of these plots were not worth harvesting.

The time of seeding trial was sown after good falls of rain in January and March had increased soil moisture levels in the top 40 cm. Soil testing completed after harvest showed that the earlier establishing dry sown crop had about 7mm less residual water in the soil profile. This is likely due to greater root development allowing increased exploitation of the soil water reserves. Dry sowing of suitable paddocks can ensure the majority of your crop is sown as close as possible to the optimum time. Dry sowing can only be contemplated where the weed burden is low or can be effectively controlled with selective herbicides. However, providing weeds can be controlled, there is very little risk of yield loss from dry sowing, even if opening rains are not received for four weeks or more after sowing.

Eaglehawk may still have a place in our farming systems when sown early. However, dry sowing of these later maturing varieties is a risk, particularly in seasons such as 2012, when opening rains are too late to achieve high yield potential.