

Performance of winter and spring wheats in a cool region

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There is virtually no cropping in the high rainfall zone of Australia. If suitable varieties were available, wheat production could become a profitable enterprise. In the colder parts, feed is always scarce during winter, so crops would need to be sown early to provide winter feed; they would also need to flower late to reduce the risk of frosts. In searching for genotypes suited to this region we examined material known to differ in responses to vernalization and long days.

Methods

Three Australian varieties, eight English genotypes and the progeny of four crosses between English winter and a spring wheat were sown in 10 x 2.3 m plots on a well fertilized loam near Cooma. Three treatments were imposed: Sow 1, Sow 1 Cut, and Sow 2. Sow 1 and Sow 2 were sown on March 31 and May 19, 1983, respectively, and cut plots were mown to ground level in June and August. All treatments were replicated four times.

Results and Discussion

The main conclusions can be drawn from a consideration of seven genotypes (Table 1).

Table 1. Measures of genotype performance

Genotype	Origin	Date of Ear Emergence			Winter feed produced (t/ha)	Grain Yield (t/ha)		
		Sow 1	Sow 1 cut	Sow 2		Sow 1	Sow 1 cut	Sow 2
<u>Spring</u>								
Gabo	Aus.	298	306	321	1.7	2.6	1.2	3.6
Egret	Aus.	306	312	306	1.6	0.9	0.8	2.4
69186	U.K.	319	333	339	2.6	5.3	4.8	5.0
Y79	Cross	306	312	319	3.2	3.1	3.3	5.7
Z80	Cross	312	319	333	3.3	5.1	5.3	5.2
<u>Winter</u>								
Isis	Aus.	306	312	319	2.8	3.1	3.5	4.3
Templar	U.K.	319	333	339	3.0	3.9	4.1	4.8
69187	U.K.	319	325	336	3.4	5.1	5.4	5.1
LSDs for yield differences (P<0.05)					0.32	0.93		

The Australian spring wheats were unsuitable for the early sowing because of their early development of ears: this restricted vegetative production and hence the supply of winter feed, and led to the ears of main shoots being killed by frosts or cutting. Consequently, flowering was confined to late tillers and grain yields were low.

Long-season wheats escaped damage in winter and so were much more productive. The potential value of English wheats in breeding programmes for the region is illustrated by yields considerably higher than those of Isis, then the only comparable Australian variety available commercially.

Although cutting or grazing commonly reduces grain yields, it had no such effect here. Its effect of delaying ear emergence usually forces grain development into high temperatures and water stress, but neither was experienced in this study.

Winter wheats appeared to offer no advantages over long-season spring wheats which matched them in flowering times from each sowing (cf. 69186 and Templar; Y79 and Isis) and equalled them in yields.

Because their main flowering-time response is to long days, few spring wheats may be suited to sowings earlier than late March.