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EXPERIMENTAL SUMMARY 1974 - C.M. FRANCIS

SEED YIELD OF EARLY MATURING CROSSBREDS UNDER WHEATBELT CONDITIONS.

Small plot trials sited at Merredin, Bencubbin and Bungil again demonstrated the 'bred' varieties to be at least the equal of Geraldton or Northam A under wheatbelt conditions.

Growing season conditions at Bencubbin were the best for pasture in recent years. Merredin and Bungil also received above average rainfall but encountered dry conditions in September. Predictably the coarse siliceous nature of the Wodgil soil at Bungil in conjunction with the dry period produced very low seed yields. Crossbred 175.1.3, the leading crossbred at Merredin in 1973, was again significantly better than Geraldton or Northam A at Merredin and Bungil (Table 1). The earliest of the available crossbreds, 175.1.3 has also been superior in hard seed content to Geraldton having an average of 22% more impermeable seeds on test sites at Wongan, Geraldton and Merredin in 1972-74. Other selections have higher hard seed content eg. 239.2, 584.1, 46.2 and though lower seed yield than 175.1.3 are worthy of further evaluation and possible seed increase.

Table 1

Seed yields 1974, flowering time and hard seed status of early maturing subclover clover crossbreds.

Variety	Seed Yield kg/ha +			Means relative to Geraldton	
	Bencubbin	Merredin	Bungil	% hard seeds *	days earlier flowering
175.1.3	771	308***	129**	+22	13
92B	660	219*	49	+27	10
337.1.3	888	187	23(-*)	+26	11
584.1	723	223*	75	+33	4
503.1B	965	228*	34	+19	7
492.1.3	756	237**	41	+17	7
239.2	796	224*	41	+32	11
29B	717	225*	53	+20	10
301.1.3	641	237*	31	+29	7
173.1.1	792	269***	43	+22	9
46.2	831	200	33	+33	9
231.1.1	683	208	81	+18	8
Northam A	584(-*)	187	40	+13	9
Geraldton	815	161	71	-	-

+ Yields differing significantly from Geraldton where indicated

p .05 *
p .01 **
p .001***

* % hard seed after 6 months softening 15 - 60°C

(Geraldton mean 4 sites = 21%)
* Flowering time; days to first flower 4 sites (Geraldton mean = 88 days).

On site hard seed evaluation near the break of the season will be made to check 'natural' softening against laboratory derived values. Available evidence has suggested actual field values to be about 10% less than values predicted from laboratory evaluations. 175.1.3 then should have 30 - 35 percent hard seed available at the break for the subsequent season. In areas where cropping is very frequent, it is by no means certain that such a level is sufficient and research is needed to define optimum levels for particular environments. Given a seed yield of 200 kg/ha Geraldton should have 20 - 40 kg of impermeable seed as a reserve which has proven insufficient to enable strong re-establishment after crops. 175.1.3 with potentially higher seed yield (say 240 kg) should have 80 - 100 kg and provide adequate reserves to persist through 1 crop in existing areas of the eastern and northern wheatbelt. Medics usually have about 50 - 55 percent of impermeable seed at the break of the season whilst the best of the subclover crossbreds should produce levels of about 40 - 45 percent. The precise definition of a function for seed yield x hard seed requirements in an intensive cropping system is a worthy field for further study.

The crossbred 175.1.3 will undergo large scale seed increase at Spedingup in 1975, smaller areas will be sown with 239 and 584 or 503, the decision depending on current seasons hard seed data. Northam A despite a rather mediocre performance in seed yield trials to date will also undergo further seed increase in 1975. Its long maturation phase is perhaps better than the crossbreds to conditions in the S.E. Wheatbelt where its efficiency as a Dwalganup replacement needs investigation.

BREEDING AND SELECTION FOR KABATIELLA RESISTANCE

Field testing of Daliak crossbred for clover scorch resistance (in co-operation with Dr. D.L. Chatel) has enabled confirmation of lab tests. Almost all lines exhibiting glasshouse resistance also did so in the field and developed only a trace of Kabatiella symptoms. Four resistant lines of a Midland B x Daliak cross (F₄) seem homogeneous enough to enable bulking and the resultant seed will be increased under single plant conditions at Medina in 1975. The maturity of these crosses lies between Seaton Park and Woogenellup (ie. about = Dinninup) and thus represents a very convenient maturity for an 'early model' Kabatiella resistant variety. Ten selections of a Bacchus Marsh x Daliak cross (F₅) also showed distinct resistance and are available for seed increase.

All selections are currently being tested for hard seed content as the Bacchus Marsh parent in particular, is inadequate in this regard.

A further series of later maturing selections, potentially of Mount Barker maturity, will be field tested this year. Of particular interest will be the Toodyay C x Daliak cross where the embodiment of the Toodyay C background with the genetic resistance of Daliak may well provide a truly Kabatiella resistant cultivar!

(C.M. Francis)
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JLB