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REVIEW AND CONTRIBUTED PAPERS

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Storage Life of Fertilizer-Coated Cenchrus ciliaris Seed

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The infertile, acid red earths (mulga soils) of S.W. Queensland will support productive buffel grass (Cenchrus ciliaris L.) pastures, provided an adequate initial population is established.

It is too expensive to broadcast the amount of phosphate fertilizer required but sowing seed which has been coated with fertilizer seems a feasible alternative (Silcock and Smith 1982). Unfortunately, the type of fertilizer needed in the coating sometimes reduces germination and the storage life of the coated seeds.

This paper reports on the storage life of buffel seed, coated with various materials and by different methods.

Methods

Some 3-year old buffel seed (Q10087) of high viability and seed fill (69% with a caryopsis) was coated using different techniques in April 1982. Some (number 3) were coated by immersion in a saturated solution of 'Monofos' (food grade sodium dihydrogen orthophosphate). Others (4, 6, 9) were wetted in 1.25% or 2.5% methyl cellulose ('Methofas') glue, then tumbled with finely ground fertilizers until the coated seeds separated out as discrete units. The fertilizers included lime, double superphosphate, 'M.A.P.' (mono ammonium phosphate), 'Monofos' or mixtures of these. All coated seeds were spread out and dried in a glasshouse, then stored in brown paper bags in a laboratory.

The seed was tested 2 weeks, 3, 6, 9, 12 and 18 months after coating, along with known good (7, 8) and bad (5) samples from a co-operating commercial firm. Tests ran for 10 days at 25°C/35°C in covered aluminium trays containing 2 cm of sieved mulga soil in an unlit chamber. Three reps of 50 fascicles were sown and watered with rainwater. Counts were made daily of all emerging seedlings.

Results and discussion

After 18 months of unsophisticated storage, the viability of some coated seeds was still high while others had fallen markedly (Table 1).

Total viability was most affected by the mixture of 'Monofos' with limestone but seemed unrelated to coat size or hardness. Fascicles with a commercially produced 'Monofos' coat had very low viability within 1 year of manufacture despite having had 38% laboratory emergence 4 months after being coated. The other two commercial products had much better viability. Seed lightly coated by immersion in a 'Monofos' solution showed no impairment of viability, neither did those wetted by a detergent solution. Speed of early emergence was more clearly affected by coatings, especially when total viability was low (Table 2). Previous studies showed that mean time to emergence is increased where coated seed is used, especially in the field.

Table 1

Viability (10 day laboratory test) of coated buffel grass (*C. ciliaris*) fascicles after 3 and 18 months storage.

Coating Type and Method	Coat Wt. (mg.)	% emergence after storage for	
		3 mths	18 mths
1. Control (no treatment)	0	61.6 ab+	64.3
2. Detergent solution (0.03%)	0	70.8 ab	72.8
3. Sat'd 'Monofos' solution	4.7	66.1 ab	63.4
4. 'Monofos' powder + glue	49.6	56.7 ab	42.7
5. 'Monofos' - commercial	8.2	0.9 d	0
6. 'M.A.P.' powder + glue	21.7	58.7 ab **	34.6
7. 'M.A.P.' commercial	14.2	30.7 c *	48.7
8. Rev. super + 'M.A.P.' - commercial	17.4	75.4 a	63.0
9. 'Monofos' / 1'stone + glue	58.9	48.0 bc **	16.2

+ Values at 3 months which are followed by the same letter are not significantly different ($P < 0.05$).

* Indicates significant change in viability between tests.

Table 2

Emergence (%) after 3 days at 25°C/35°C of selected examples of coated buffel seeds stored for different times.

Coating	3 Months	18 Months
1. Control	59.5 ef+	59.5 ef
2. Detergent only	63.5 ef	70.2 f
3. 'Monofos' solution	59.4 ef	56.0 ef
4. 'Monofos' powder	7.5 bc	1.7 ab
8. Rev. super + 'M.A.P.' - commercial	34.6 d	2.6 ab
9. 'Monofos' / limestone mix	0 a	0 a

+ Values followed by the same letter are not significantly different ($P < 0.05$)

Conclusions

It is possible to store fertilizer-coated buffel grass seed for long periods in a dry environment without seriously impairing its viability. However, certain coatings can seriously and unexpectedly impair seed viability. The reasons for this are not yet known but heavy coatings will exacerbate any mild toxicity. All water soluble coatings slow the rate of seedling emergence.

Reference

Silcock, R.G. and Smith, Flora T. (1982). Seed coating and localized application of phosphate for improving seedling growth of grasses on acid, sandy red earths. Aust. J. Agric. Res. 33: 785-802.