QUEENSLAND DEPARTMENT OF PRIMARY INDUSTRIES
DIVISION OF PLANT INDUSTRY BULLETIN No. 430

EFFECT OF SEED TREATMENTS ON BRACHIARIA MUTICA AND B. RUZIZIENSIS

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SUMMARY

Sulphuric acid treatment greatly reduced the viability of *Brachiaria mutica* seed but materially increased the germination of *B. ruziziensis* seed.

Introduction

Brachiaria mutica Stapf (para grass) is usually planted by vegetative means in Queensland, as seed produced for field planting has often shown poor germinability in the field. It has not been determined what causes the low germinability, and work reported here was undertaken to ascertain whether the cause was low inherent fertility.

At the same time, seed of a recent introduction, *Brachiaria ruziziensis* Germain and Evard, since released as Kennedy ruzi grass, was examined for germinability.

The work was conducted at the Tropical Agriculture Research Station, South Johnstone (lat. 17½°S.)

Materials and Methods

The seed of para grass was collected in April 1963, and of Kennedy ruzi grass in early May 1963. Diquat was used as a desiccant on a section of the seed plot, harvesting being effected 24 hr after application of the desiccant.

Caryopsis counts were made by stirring four lots of 100 florets in a beaker containing concentrated sulphuric acid for 10 min, then drying the sample at 95°C and counting the dehulled caryopses. The sample of para grass used contained 30% caryopses and that of Kennedy ruzi grass 46% caryopses.

Treatments applied to seed of both grasses were:

(1) Immersing and stirring the seed in concentrated sulphuric acid for 10, 15 and 20 min, followed by washing in running water and air-drying.

(2) Mechanically scarifying the seed by running it between sheets of sandpaper until caryopses were freed from glumes.

(3) Heating the Kennedy ruzi grass seed in a laboratory oven at 50 and 65°C for 8 hr on each of three consecutive days; heating the seed of para grass in a laboratory oven at 55° for 4 days.

Germination studies were made by planting 100 seeds (florets containing caryopses) in rows of boxes filled with washed and steam-sterilized river sand. Planting of Kennedy ruzi grass was carried out on July 28, 1963, and of para grass on August 23, 1963. Seedlings were counted weekly until seedling emergence ceased. The surface of the sand was kept moist throughout the trial.

Results and Discussion

The seedling counts for Kennedy ruzi grass at day 35 are presented in Table 1. Acid treatment for 15 min materially increased germination and exceeded all other treatments at the 1% level of significance. Data for counts at day 7, not recorded here, show that acid treatment and sandpaper scarification both hastened the germination of fresh seed. Other unrecorded data indicate that diquat had no effect on the viability of the harvested seed and so could be used to facilitate mechanical harvesting.

TABLE 1

EFFECT OF TREATMENTS ON PERCENTAGE RUZI GRASS EMERGENCE

Treatment	Emergence* (%)
Control	16·9 (0·423)
Heat (50°C)	16·5 (0·419)
Heat (65°C)	10·8 (0·335)
Acid scarification	40·0 (0·684)
Sandpaper scarification ..	24·1 (0·513)
Necessary differences for significance 5%	(0·090)
Necessary differences for significance 1%	(0·121)

* Bracketed values are from inverse sine transformation.

Table 2 shows that para grass seeds germinated well without any treatment and that acid treatment greatly reduced the viability of the seed. Since the glumes enclosing the caryopsis are light and are not closely appressed to the caryopsis increased germination from scarification could not be expected.

TABLE 2

EFFECT OF SEED TREATMENTS ON PERCENTAGE PARA GRASS EMERGENCE

Treatment	Days after Planting*	
	7	28
Control	76·0 (1·059)	78·7 (1·091)
Sandpaper scarification ..	63·6 (0·924)	82·0 (1·133)
Heat (55°C for 4 days) ..	48·6 (0·772)	72·0 (1·014)
Conc. sulphuric acid, 10 min	7·0 (0·269)	13·5 (0·377)
Conc. sulphuric acid, 15 min	25·3 (0·527)	49·5 (0·780)
Conc. sulphuric acid, 20 min	4·0 (0·201)	5·4 (0·235)
Necessary differences for significance 5%	(0·183)	(0·135)
Necessary differences for significance 1%	(0·253)	(0·187)

* Bracketed values are from inverse sine transformation.

The figures for day 7 indicate that para grass seed requires little, if any, rest period.

The high percentage of viable seed obtained by careful harvesting suggests that the rapid shattering of mature seed accounts for the poor quality of commercially harvested para grass seed.

(Received for publication November 16, 1966)

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S. G. REID, Government Printer, Brisbane