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Effect of Gibberellin and Light on Germination of Centipedegrass Seed

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EFFECT OF GIBBERELLIN AND LIGHT ON GERMINATION OF CENTIPEDEGRASS SEED (EREMOCHLOA OPHIUROIDES) 1/

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Centipedegrass is a lawn grass of minor importance along the Gulf Coast. Seed production is very limited and restricted to certain areas. The seeds are not often encountered in regular trade channels. Processed centipedegrass seed are hulled and somewhat larger than those of hulled Bermudagrass and about the same color and general shape.

The Rules for Testing Seed (1) 2/ do not prescribe methods for germination of centipedegrass seed. Preliminary work at the Mississippi Seed Technology Laboratory in 1956 revealed that the seeds were dormant and that dormancy persisted for a period of a year or longer. This early work also indicated that 20-30° C. was more effective than several constant temperatures in forcing germination. In 1958 centipedegrass was included along with several other species in a general study on the effect of gibberellin on seed dormancy.

The gibberellins have b een shown to have rather pronounced effects on dormancy in several species (3). With the exception of wild oats (2), however, dormant grass seeds have shown little response to the gibberellins.

Methods and Materials

Samples from five lots of centipedegrass seed were obtained from the Patten Seed Company, Lakeland, Georgia. The seed was from the 1957 crop. During the course of the experiments the seeds were stored at room temperature (20-25° C.)

Gibberellin was applied as a seed soak in an aqueous solution of the potassium salt of gibberellic acid. The seeds were soaked for 16 hours in solutions of various concentrations. At the end of the soaking period, they were briefly dried to facilitate planting. Filter paper in petri dishes was used as the germination substrata. One hundred seeds were planted in each dish and the dishes placed in a 20-30° C. germinator. Light when used was supplied by white fluorescent bulbs yielding about 100 foot candles for eight hours each day. The dark condition was obtained by placing the petri dishes in black plastic boxes. Four 100 seed replicates were used for each treatment.

Results and Discussion

Gibberellin and light both had pronounced effects on germination of centipedegrass seed (Table 1). Under dark conditions a concentration of 1000 ppm. gibberellin was required to obtain maximum germination. Under light, however, only 100 ppm. of gibberellin was required. At the four month interval after

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2/ Refers to literature cited.

harvest, light alone was not sufficient for complete germination. As the interval after harvest increased, the degree of dormancy decreased and lower concentrations of gibberellin were effective.

Table 1. Effect of gibberellin and light on germination of centipede grass seed at intervals of four and eight months after harvest.

Time after harvest (mos.)	Condition	Gibberellin (ppm.)				
		0	100	500	1000	2000
4	Dark	27	59	66	86	--
	Light	64	83	84	88	--
8	Dark	52	66	80	82	69
	Light	78	86	89	88	84

Table 2. Effect of gibberellin and light on rate of germination of centipede grass seed.

Lot	Condition	Gibberellin (ppm.)	Days After Planting			
			4	6	8	14
A	Dark	0	11	27	64	72
		1000	22	58	76	80
	Light	0	16	39	83	86
		1000	22	64	84	88
B	Dark	0	11	24	40	49
		1000	31	64	74	76
	Light	0	5	30	74	79
		1000	28	65	78	78
C	Dark	0	16	26	56	63
		1000	39	75	85	89
	Light	0	11	44	84	88
		1000	33	66	89	92
D	Dark	0	6	26	64	66
		1000	13	52	69	72
	Light	0	5	28	70	74
		1000	19	62	86	86

Gibberellin not only had an effect upon total germination but also upon rate of germination (Table 2). Even in cases when light alone was sufficient for complete germination, gibberellin treatment at 1000 ppm. promoted much more rapid germination. This was particularly true during the first eight days of the germination period. Rate of germination of gibberellin treated seed was similar under both dark and light conditions.

One of the difficulties in establishing a centipedegrass lawn by seed is the long period required for germination and emergence. Persons attempting to establish centipedegrass lawns frequently become discouraged when they are unable to detect visible emergence in 10 to 14 days and rework the lawn for planting of other species. It was felt that the germination promoting effect of gibberellin in petri dishes might also have application in soil. Accordingly, centipedegrass seed treated with gibberellin as previously described were planted 1/4 inches deep in a one/third sand - two/thirds soil mixture contained in plastic boxes. The boxes were then placed in a 20 - 30° C. light germinator.

The results of this test (Table 3) indicate that gibberellin was effective in increasing both rapidity of emergence and total emergence under the soil conditions as described. However, germination percentages in the soil, even with gibberellin treatment, were considerably lower than germination percentages obtained in petri dishes. Either the effectiveness of gibberellin was reduced under soil conditions or the seeds succumbed to attack by soil micro-organisms.

Table 3. Effect of gibberellin treatment on emergence of centipede grass seed from soil.

Lot	Treatment	Days After Planting			
		6	8	10	14
A	Water	0	3	12	13
	1000 ppm. Gibberellin	17	40	56	64
B	Water	8	12	21	28
	1000 ppm. Gibberellin	18	30	43	50
C	Water	10	15	19	38
	1000 ppm. Gibberellin	21	35	51	55
D	Water	4	5	9	14
	1000 ppm. Gibberellin	8	15	31	37

Conclusions

Germination of centipedegrass seed was greatly increased by presoaking the seeds for 16 hours in a 1000 ppm. aqueous solution of the potassium salt of gibberellic acid. Light also had a promoting effect on germination. Light alone, however, was not sufficient to completely break dormancy in freshly harvested seed. Gibberellin treated seed emerged more rapidly and to a greater percentage in soil than did non-treated seed. Gibberellin treatment was not as effective in promoting germination when the seeds were planted in the soil as when they were planted on filter paper in petri dishes.

Literature Cited

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