Gibberellin on Zoysia Grasses

plant growth regulator did not improve establishment of slow growing turf grass in either greenhouse or field experiments

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Gibberellic acid—one of several similar growth promoting substances—produces a rapid abnormal elongation of shoots and leaves in many plants at dilutions as low as one ppm—part per million.

Studies conducted in 1957 were designed to determine what practical value gibberellic acid might have in increasing the rate of establishment of grasses planted vegetatively. Zoysia was chosen because it is notorious as a slow growing grass.

The first studies were on uniform size plugs of Emerald Zoysia planted in pots of pure sand in a greenhouse kept at 65°F minimum. The plugs were watered daily with a complete nutrient solution. Approximately two weeks were allowed for the plugs to recover from the transplanting shock before treatments were begun.

Treatments

Solutions of gibberellic acid—0, 1, 10 and 100 ppm—were applied in equal volumes with a small atomizer which thoroughly wet all the foliage. All treatments were replicated four times. Measurements of the height of the grass were made at the five- and seven-week periods after the first treatment. Also, the tops were clipped at the times of measurement and the clippings oven dried and weighed. Immediately after clipping, the plugs were again given the gibberellic acid treatments, making a total of three treatments during the experiment. Ten weeks after the start of the experiment the plugs were removed from the pots; the sand washed off the roots; tops and roots separated, oven dried and weighed.

Three days after the first treatment a pronounced increase in plant height was observed in the 100 ppm treatment and to a lesser degree in the 10 ppm treatment. The increase in height was accompanied by a lightening of the green color. By the time of the first clipping, the plants treated with 10 and 100 ppm of gibberellic acid were significantly taller than the untreated plants. The plants receiving 100 ppm were significantly taller than all other treatments. The same increase in height was observed at the time of the second clipping. Gibberellic acid at 1 ppm had no significant effect on top growth.

Effects of Gibberellic Acid Treatments on Emerald Zoysia Growth

Treatment G. A. ppm	Mean height inches		Mean total dry weight (grams)	
	1st clip	2nd clip	clippings	roots
Check	1.50	2.13	6.72	4.27
1	1.63	2.50	7.90	5.93
10	1.94	2.94	7.93	6.05
100	4.38	4.00	9.64	5.40
LSD*	0.58	0.32	1.11	2.21

* Least significant difference at 5% probability level.

No treatment produced a significant increase in horizontal spread over the check during the course of the experiment. At the time the plugs were removed from the pots all were still essentially the same diameter as at the time of planting.

Dry Weights

All concentrations of gibberellic acid significantly increased the dry weight of clippings over the untreated. None of the treatments had any effect on the dry weight of the roots produced during the time the experiment lasted. It is possible that additional gibberellic acid treatments over a longer period of time might significantly increase or decrease the weight of the dried roots.

Field plantings of Meyer strain of *Zoysia japonica* and two selections of *Z. matrella* were established in the summer of 1957 to further test the effects of gibberellic acid on Zoysia. The planting material was washed in water to remove all soil. Half of the material was then dipped in a 100 ppm solution of gibberellic acid and half was untreated. Planting was done with uniformly spaced sprigs.

All the sprigs turned brown after planting and showed no new growth for approximately two weeks. New growth appeared first in the plots from the untreated materials of all varieties and could be clearly seen throughout before any appeared on the plots from the treated material. Early growth was lighter green on treated material than on the untreated, despite regular applications of nitrogen. The gibberellic acid appeared to have reduced slightly the percent survival of the sprigs.

Plant Growth

The effects of the initial injury and growth retardation were evident throughout the summer. The plots planted with the untreated material had a higher per cent cover than the treated plots by the time low temperatures in the fall stopped growth.

The studies showed that treating Zoysia planting material with gibberellic acid did not improve the rate of turf establishment. The increased top growth demonstrated in the greenhouse studies may be little value as far as turf is concerned.

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The above progress report is based on Research Project No. 1471.

SOLAR

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call for a roof projection of 60″–80″. Such an amount will fully control the summer sunlight without interfering unduly with the winter radiation. Because of the difference in heat conditions in March and in September, some roof projections are made adjustable or removable. Thus the long overhang for September or October can be removed to admit more solar heat in March and April.

California extends north and south over more than 9° of latitude—from 42° to less than 33°—which makes a significant difference in solar angles and in the amount of roof overhang necessary in varying localities. The map shows the range of latitudes, together with typical cities in each region, the noon solar angles and common roof overhangs suitable for sun control in those latitudes during the different seasons.

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The above progress report is based on Research Project No. 396-H.