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# EFFECTS OF GIBBERELLIC ACID (GA<sub>3</sub>) ON GROWTH AND YIELD OF LEEK (*ALLIUM PORRUM* L.)

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An experiment was conducted to determine the effects of gibberellic acid (GA<sub>3</sub>) on growth and yield of "American Flag" leek (*Allium porrum* L.) grown in containers. It was found that GA<sub>3</sub> foliar application in dosages ranging from 0 (control) to 50 ppm did not cause significant effects on growth or yield when applied seven days after transplant (four-leaf stage). However, GA<sub>3</sub> application 21 days after transplanting (seven-leaf stage) significantly increased leaf area as well as pseudo-stem weight and diameter at rates 30, 40 and 50 ppm, although no significant effects were detected on plant height and pseudo-stem length. These results suggest that yield and quality of "American Flag" leek can be enhanced by GA<sub>3</sub> application in the seven-leaf stage.

## INTRODUCTION

In the Dominican Republic, leek (*Allium porrum* L.) is a crop grown in small areas and of a limited market. The general public prefers the use of other *Allium* species such as garlic, chive and onion, although leek is also appreciated among consumers of higher incomes. The main markets for leek are the the exportation market as well as the hotel market, which demands leek for special dishes for the tourists. The supply of good quality leek is limited, because leek grows better in cool climates, but growers in the cool regions of the country prefer to produce more profitable crops such as garlic. Leek growers in low altitude-warm climate conditions usually produce leeks that are too thin for the consumer's requirements. Plant growth regulators can alter the size of plant organs, and the several experiments to determine their effects on leek growth were included in our program of experiments on plant growth regulators in *Allium* crops in the Dominican Republic. The objective of the experiments deccribed in this paper were to determine the possible effects of foliar applications of GA<sub>3</sub> and PMPA on "American Flag" leek, as well as to determine the difference in effect when the regulators were applied during the four-leaf stage and the seven-leaf stage.

## MATERIALS AND METHODS

The experiment was conducted in Santo Domingo, during the summer (June-September) of 1993. A completely randomized design with six replications was used. Plantlets were grown in a nursery and transplanted to sandy loam soil in plastic containers 15 cm height x 15 cm diameter. Transplanting was done when plants reached the four-leaf stage. Treatments consisted of foliar sprayings of aqueous solutions of GA<sub>3</sub> at rates of 0, 10, 20, 30, 40 and 50 parts per million (ppm), at either the four-leaf stage or the seven-leaf stage. The variables evaluated were leaf area, plant height and pseudo-stem weight, diameter and length, which were determined at harvest time, 50 days after transplanting.

## RESULTS AND DISCUSSION

No significant effect of the treatment was found for the variables plant height and pseudo-stem length at either application time. Leaf area (data not shown) and pseudo-stem fresh

weight and diameter were significantly higher at rates 30, 40 and 50 ppm when applied 21 days after transplanting (seven-leaf stage). The lower rates (10 and 20 ppm) were not significantly different than the control. No significant effect of the regulator was found when the application was performed during the four-leaf stage, regardless of the rate. It is possible that at the four-leaf stage this cultivar of leek is not sensitive to GA<sub>3</sub> application. It is also possible that the application seven days after transplanting might be too soon for the plant to react to treatment, because it might not be recovered from the stress of transplant. The significant increases in pseudo-stem diameter and weight are probably due to a GA<sub>3</sub> stimulation of cell division and/or growth of the leaf sheaths of which the pseudo-stem consists. According to the results, rates of 30 or more ppm are needed to significantly stimulate this response.

## CONCLUSIONS

Leek plant did not show significant responses to GA<sub>3</sub> at any of the rates tested when treated during the four-leaf stage. Significant responses were found for leaf-area, pseudo-stem diameter and pseudo-stem weight at rates 30-50 ppm applied at the seven-leaf stage. Since pseudo-stem thickness (diameter) is a major component of the quality requirements for marketing, it is suggested that GA<sub>3</sub> application at rates 30-50 ppm during the seven-leaf stage might result in better quality leeks. Other experiments testing different rates and application times have been included in our research schedule to explore other possible response patterns.

## GROWTH AND FLOWERING RESPONSES OF CULANTRO (*ERYNGIUM FOETIDUM* L.) TO PROGIBB SPRAYS

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Culantro also known as shadow beni, chadron beni, fit weed, bandhaniya and recao in the Caribbean is an aromatic biennial herb native of Central America and the West Indies where it is used as a major ingredient of many West Indian and Latin American dishes. Although closely related to the Asian culinary herb - cilantro or coriander, culantro is mainly prized for its green serrate spatulate-shaped leaves the main source of its oil. Like many other umbelliferae under tropical conditions culantro produces large seed-bearing inflorescences which are labor-intensive to remove, retard leaf growth and hence decrease the market value of the plant. This study incorporated the growth-promoting hormone ProGibb as sprays from 50 to 200 ppm to 1-month old culantro plants grown under 53% shade. Preliminary results indicated increased leaf length and size and reduced flower-size to increasing levels of ProGibb. Maximum leaf length, leaf dry weight and minimum flower growth were recorded at ProGibb concentrations of 100 ppm and above. Treated plants also appeared to produce more vegetative side shoots. Postharvest observations indicated no apparent decrease in shelf life nor loss of characteristic leaf aroma in leaves harvested from ProGibb-treated plants. Inflorescences from sprayed plants were less thorny and woody, reduced in size, had leaf-like appearance and produced characteristic culantro aroma indicating that they may also be utilized in culantro cuisines.