

Use of Colchicine in Nutrient Solution With Sugar Beets

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Gardeners have noted an abnormal growth of plants which followed *Colchicum autumnale*. This fact suggested to the author the use of colchicine in nutrient solution or in soil to induce chromosomal aberration in sugar beets. This method has not been tried before, so far as the writer is aware.

Materials and Methods

A rectangular tank of 4-cubic-foot capacity was used with nutrient solutions prepared according to Gericke's formula.² Soil in 8-inch pots was also used. Overwintered sugar-beet steeklings were planted on January 10 in a seedbed suspended above the nutrient solution and in the pots of soil. A total of 350 cc, 1 percent concentration colchicine was added to the nutrient solution in installments at intervals of approximately 10 days. Relatively greater amounts were added to the soil in the pots.

Observation for stoma size in the leaves was made and giant pollen was looked for. Note was made of seedball size. Of the plants which flowered, some were open pollinated and others were selfed. The plants were given supplemental light to make the day length 22 hours.

Experimental Results

The plants in the pots were so distorted in growth that they did not produce seed. Those in the tank grew rapidly to a height of 6 feet, flowered in 60 days and set seed within 90 days. Enlarged stomata were observed. Only small amounts of giant pollen were found. Seedball size was normal.

Seed from the treated plants produced a high percentage of abnormal seedlings—thickened hypocotyls and malformed cotyledons and leaves. After 3 weeks a count of the entire population revealed that 62.4 percent of the open-pollinated lot and 77.4 percent of those from the inbred lot were affected.

Conclusion

Application of colchicine in the nutrient solution appears to merit further investigation.

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²Gericke, William F. The Complete Guide to Soilless Culture. 1940. p. 54.