

Gibberellin Sprays on Celery

field trials in southern California revealed differences in results due to spray concentrations, timing, and to season

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Investigations with gibberellin sprays—initiated in the summer of 1957—were carried out in commercial celery fields in Orange, Ventura, and San Diego counties, during the summer, fall, and winter production periods.

Celery varieties, 52-70, 10-B, and 16-11, were sprayed with solutions containing 0, 1, 10, 25, and 100 ppm—parts per million—of Gibrel, a preparation of the potassium salt of gibberellic acid, at the rate of 100 gallons per acre. Plants were sprayed at one or more of three stages of plant growth, namely, 6"-8", 12"-14", or 24"-26" in height. The sprays were applied at approximately monthly intervals with the last being about three weeks before the expected harvest.

For the summer and fall crops, 25 ppm and 100 ppm Gibrel sprays produced a temporary acceleration in plant growth. The 1 ppm and 10 ppm sprays did not produce any visible increase in plant

height, but the latter concentration was associated with lighter colored foliage. Accelerated growth of the foliage was associated with a slight yellowing and chlorosis of the leaf blades. Observations made at various times following the spray applications indicated that even at the highest concentration, Gibrel was effective in stimulating growth for only about

3-4 weeks. After that time, the plant no longer showed the yellowish colored leaves. At harvest, slightly taller plants with longer petioles were obtained on plots receiving the 25 ppm and the 100 ppm sprays, but total plant weight was not increased significantly in any test.

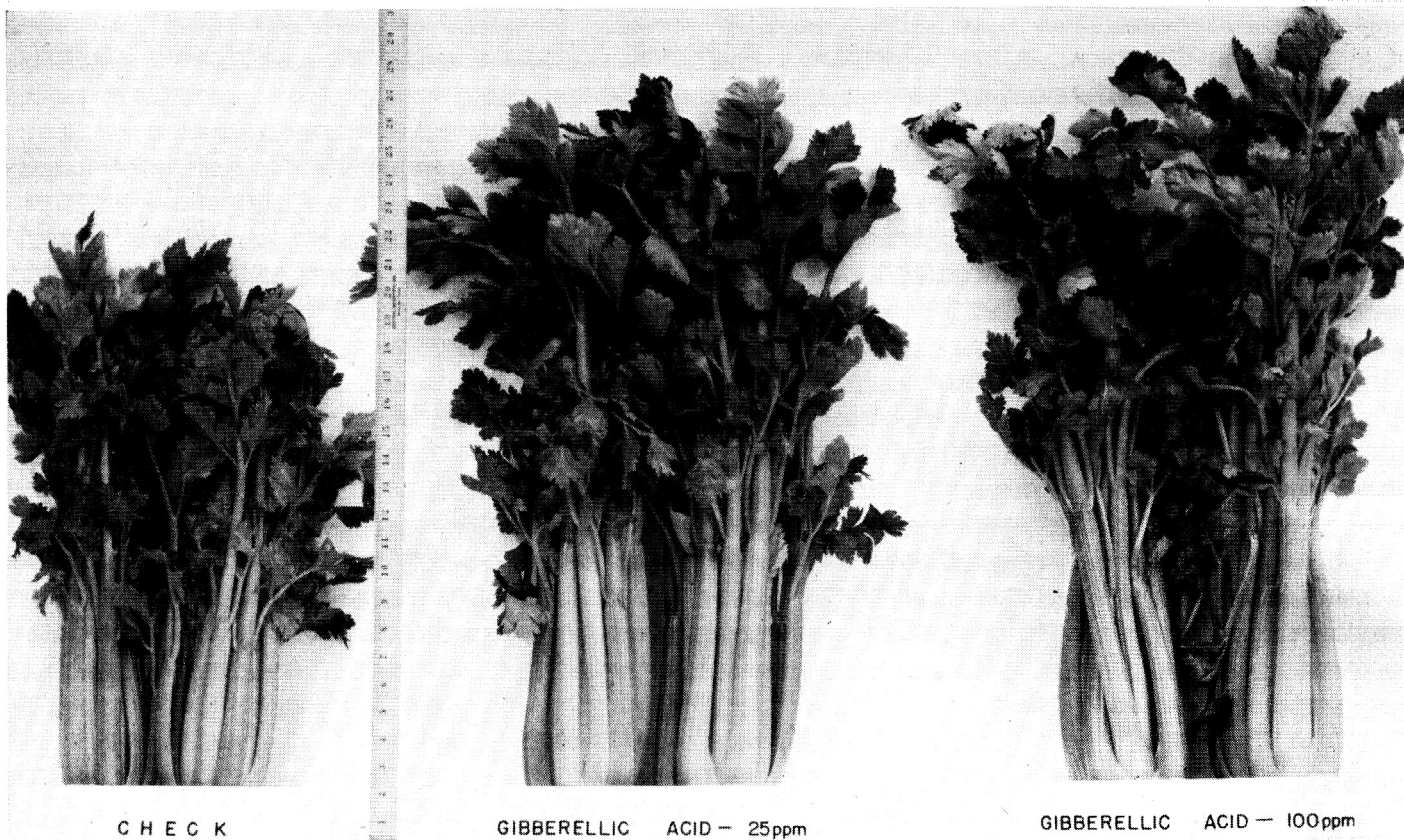
Gibrel sprays at concentrations of 10 ppm or more initiated seed stalks. This condition prevailed irrespective of the stage of growth at which the plants were treated. With single spray applications, the longest seed stalks and the highest percentage of plants with visible seed stalks occurred on plots receiving the highest concentration of Gibrel and at the earliest date. Increasing the number of spray applications generally increased the intensity of seed stalk development. Plants sprayed 3-4 weeks before harvest usually did not have visible seed stalks; however, seed stalks had been initiated as determined by dissecting the plant.

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Average Length of Seed Stalks in Inches for Celery Plants Sprayed with Gibrel at Three Stages of Plant Growth. Test in Orange County, Fall 1957

No. of applications						
		One		Two		Three
Gibrel	Date of Application					
	8-14	9-4	9-23	8-14 and 9-4	9-4 and 9-23	8-14, 9-4 & 9-23
ppm	Length of seed stalks—Inches					
10	0.9	0.9	1.6	1.5	1.0	1.4
25	2.0	1.3	0.9	1.9	1.7	1.9
100	2.8	1.7	1.7	4.9	4.7	7.3

Celery plants sprayed with Gibrel four weeks before harvest—Orange County, winter 1958.



CELERY

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In the fall and winter of 1958, more than 15 trials were conducted to determine the effects of late applications of Gibrel sprays. Gibrel sprays at 25, 50 and 100 ppm were applied as single applications four weeks before the intended harvest date. Most of the tests were conducted on the short-shanked varieties which are inherently better adapted for cool-season production, but which often produce stalks too short for best commercial production.

Plant growth was stimulated by all three spray concentrations. The 50 ppm and the 100 ppm sprays increased the length of the petiole in the variety 52-70 by approximately 1"-2" and in varieties 16-11 and 10-B, by 2"-3". In every test the petioles were longer for the 100 ppm spray than for the 25 ppm, but there was little difference between the 100 ppm and the 50 ppm concentrations. In variety 52-70, the increase in petiole length was negligible for the 25 ppm spray; however, an increase of 1"-2" was obtained in the 16-11 and 10-B varieties.

Increase in total plant height was confined to elongation of the heart and adjacent whorl of leaves. There was no elongation of the outer whorl. The total plant weight was increased slightly in some tests but in others there were no differences.

In trials conducted in Monterey County, similar differences in varietal responses to spray concentrations were recorded.

In eight tests in Orange and San Diego counties comparisons were made between spraying the plants directly overhead and into the heart of the plant as against spraying only along the sides of the plant. Differences in plant stimulation were not obtained by the two methods of spray application.

Results obtained in 1957 and 1958 indicate that celery responds more favorably to Gibrel stimulation when environmental conditions are the least favorable for optimum plant growth. In 1957, when celery plants were growing actively, the response to Gibrel application was limited. In 1958, when plant growth was very slow, the most pronounced responses to Gibrel sprays were noted.

Sprays should be applied at concentrations of 10-20 grams of Gibrel per acre. This is equivalent to 25-50 ppm of Gibrel in 100 gallons of spray. Because of the danger of seedstalk formation from early application, the spray should not be applied earlier than one month before harvest.

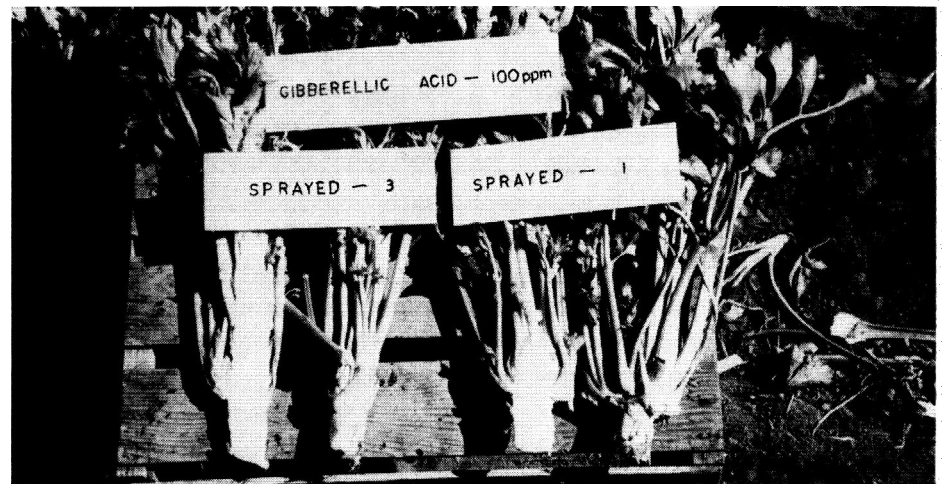
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Seedstalks in celery resulting from gibberellin sprays. Plants on left received three sprays of Gibrel. Plants on right received a single spray applied when they were about 6" tall.



Response of Celery to Gibrel Sprays Applied Four Weeks Before Harvest. Fall and Winter, 1958

Gibrel	Orange County			Ventura County			San Diego County			Orange County			San Diego County		Monterey County
	Harvest date 11-16-58			Harvest date 12-8-58			Harvest date 12-18-58			Harvest dates 1-16-59 2-1-59			Harvest date 2-26-59		Harvest date 10-13-58
	Variety 52-70	Variety 52-70	Variety 52-70	Variety 52-70	Variety 52-70	Variety 52-70	Variety 16-11	Variety 10-B	Variety 16-11	Variety 16-11	Variety 16-11	Variety 16-11	Variety 16-11	Variety 16-11	Variety 10-B
ppm	Average length of the longest leaf—-inches														
0	23.9	29.4	28.9	26.6	22.4	22.8	27.4	25.6	24.6	23.1	21.5	26.3	25.4	26.2	27.1
25	...	...	...	...	...	...	29.2	29.3	27.9	27.1	25.2	28.8	28.7	28.8	...
50	28.1	32.9	33.5	28.5	26.4	29.5	31.9	30.5	30.6	28.3	26.2	28.4	29.6	30.2	32.7
100	28.3	33.4	34.6	28.9	26.4	29.0	33.2	31.8	31.2	28.9	26.6	30.7	30.7	30.3	34.2
	Average shank leaf—-inches*														
0	9.7	10.6	11.0	9.5	8.8	9.8	11.0	9.9	9.3	8.5	9.5	10.4	10.9	11.4	8.7
25	...	...	...	...	...	...	11.9	11.8	11.3	11.1	10.7	11.7	13.1	13.0	...
50	11.2	12.1	13.4	11.4	11.3	11.3	13.7	12.8	13.0	11.5	11.6	11.7	13.8	14.3	10.3
100	11.9	12.8	14.0	11.5	11.6	11.1	14.1	13.7	13.0	11.8	12.0	12.7	14.1	14.4	10.6
	Average weight per field-trimmed plant—pounds														
0	3.0	2.8	2.4	2.4	1.9	2.8	3.3	2.4	3.2	3.7	2.7	3.8	3.9	4.2	2.4
25	...	...	...	...	...	...	3.6	3.2	4.0	4.2	3.1	4.2	4.0	4.6	...
50	3.4	3.4	2.8	2.7	2.2	2.8	3.7	3.2	4.1	4.2	3.2	4.2	4.6	4.8	2.9
100	3.4	3.3	3.0	2.8	2.6	2.8	3.9	3.3	4.2	4.2	3.2	4.1	4.8	4.8	3.1

* Measured between the base of the leaf and the first leaflet.