



New York State Flower Growers

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Plant Gladiolus Early to Reduce Spread of Cucumber Mosaic Virus

Arthur Bing and George Johnson

Department of Floriculture, Cornell University and Entomology Research Division, Agr. Res. Ser., USDA Farmingdale, Long Island, New York

One of the major diseases of gladiolus is cucumber mosaic virus. The authors discuss their results with repelling the carrier of this disease, the aphid. Their results are very interesting.

Cucumber mosaic virus (CMV) is a serious problem in the production of gladiolus cut flowers and corms because virus infected plants usually produce unsalable flowers. At the Cornell-USDA Ornamentals Research Laboratory on Long Island, the later gladiolus plantings generally have been most seriously affected by CMV. This has been confirmed by observations of gladiolus growers. For example, questionnaires for 1965 (1) returned by 31 growers located in various sections of the United States and Canada showed 17 reports of most virus on late plantings, 1 of most on midseason plantings, 1 of most on early plantings, 6 of virus all during the season and 6 of no virus.

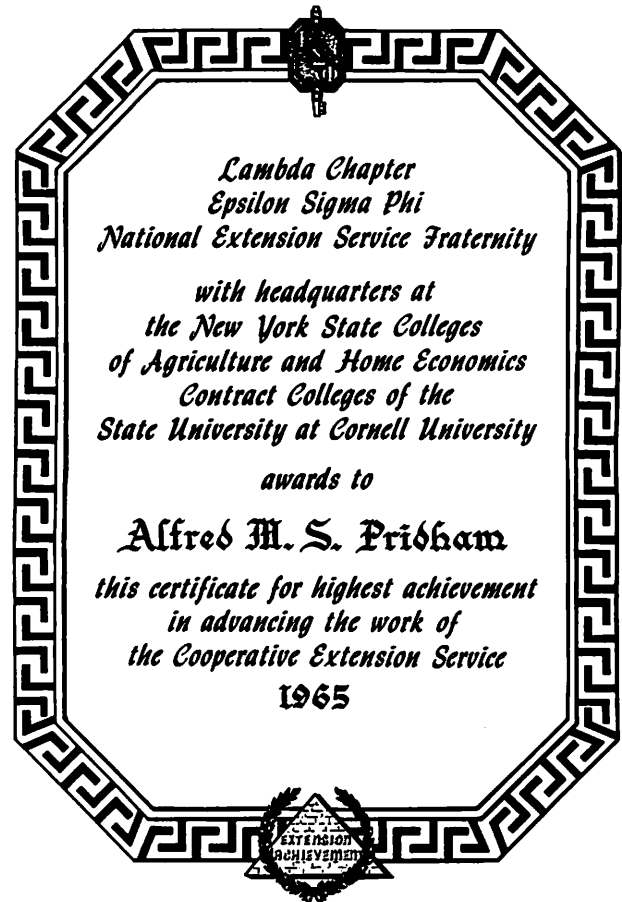
What The Virus Does To The Gladiolus

CMV infection in most varieties of gladiolus is expressed as white speckled streaks on the foliage (Fig. 1) and in varieties with colored flowers as a blotching or color break in the petals (Figs. 2 and 3). In certain varieties with white or yellow flowers the virus causes a distortion of the flower. Badly infected plants of some varieties are severely dwarfed and may not flower. Infected corms of some varieties are wrinkled or pitted (Fig. 4) and have
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Carnation Leaf Analysis

Carnation growers in New York State may now take advantage of a leaf analysis service. The Department of Floriculture and Ornamental Horticulture, Cornell University, Ithaca, New York, announces the beginning of a Carnation Leaf Analysis Service for New York State flower growers. This service is the result of the research work of Paul Victor Nelson that was reported in the New York State Flower Growers Bulletins 221, 223, 230 and 234. Carnation growers may now take leaf samples from their plants on a regular basis and submit them for analysis to
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Pridham Receives Extension 'Award of Merit'



The Citation read:

Al, undertaking to research, field test and to reliably instruct commercial nursery producers to follow your proven weed control recommendations was no easy row to hoe. In addition to other job commitments, your thirty-three years of travel to all areas of the state thrust aside many personal considerations, but ensured the exacting conditions needed. Your dedication to research and extension methods has enabled New York Nurserymen to encouragingly meet the challenge of competition.

Weeds have plagued mankind since he first looked to cultivated plants as affecting his livelihood. Centuries passed before needed knowledge was established that brought weed control from a strictly mechanical area into the realm of modern basic science. Weed control has been a serious economic problem to nurserymen and landscape
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Plant Gladiolus Early

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wrinkled husks. Although a few varieties may carry the virus without showing symptoms, infected corms usually produce plants with mottled flowers and foliage. Virus infected corms produce virus infected plants and virus infected gladiolus plants. Brierley (3) reported in 1963 that healthy cormels (from 47 to 98%) were obtained from CMV infected corms and through isolation, healthy stocks of a diseased variety can be restored.

How The Virus is Spread

The virus is mostly spread by winged aphids. These aphids land on a gladiolus plant, pierce the epidermal cells and commence feeding. They may visit several plants in quick succession. If they feed first on an infected plant then on a clean plant, they can easily transmit the virus on their mouthparts. Because of short visits to plants it is difficult to kill the aphids before they spread the virus.

Although Brierly (2) demonstrated that the virus can be spread by the cutting knife, this probably is not important in virus spread in the fields. From a practical standpoint infected plants and aphids are necessary.

Results With a Succession of Weekly Plantings

The effect of time of planting on the natural spread of virus was studied at the Ornamental Research Laboratory from 1961 through 1964. A succession of weekly plantings was made each season except that in 1964 the first 4 plantings were at biweekly intervals. Plots of "clean" (essentially virus free) gladiolus corms were planted near plots of CMV infected corms. The variety Friendship was used for these experiments because it is a commercial variety and readily shows symptoms after infection with CMV. All flowers harvested from the previously "clean" plots were visually rated for CMV. Tables 1-4 show the data for the individual years and Table 5 summarizes the results for the 4 years. Low yields in some weekly plantings were due to causes other than CMV, i.e. Fusarium, cultivation, decline of corms in storage or lateness of planting. The results vary from one year to another. In 1961 (Table 1) virus spread was fairly high early in the season, 30% from an April 21 planting but much higher 39% 46% and 43% from July plantings. In 1962 (Table 2) virus spread was low, 10% or less until the June 7 planting, but over 50% from the late June to late July plantings. In 1963 (Table 3) virus spread was fairly low until the late April plantings but was highest in the last June and first 2 July plantings. In 1964 (Table 4) there was fairly high spread in the late April plantings (27%) and then it was lower until the June 10 planting. In 1961 and 1964 there was not as great a peak period of spread as in 1962 and 1963. The 4 year totals summarized in Table 5 show a definite increase from a low of 8% CMV infected flowers for early April plantings to 46% for late July plantings.

Variability of Aphid Populations

Yellow pan water traps (3) (Fig. 4) were placed near the weekly plantings to catch winged aphids. Traps were

Table 1. Flower production and CMV infection in weekly plantings of gladiolus at Farmingdale, N. Y. 1961.

Planting Date	Flowers Picked		
	Total No.	CMV Infested No.	%
April			
21	158	47	30
27	60	16	27
May			
3	130	28	22
11	97	26	27
17	111	19	17
24	134	16	12
June			
1	90	14	16
8	54	6	11
14	23	1	4
20	1	0	0
28	9	2	22
July			
5	18	7	39
12	33	15	46
18	7	3	43

usually set up when the gladiolus shoots from the earliest plantings came through the soil surface. Aphid counts for the years 1961-1964 are shown in Table 6 but data is not complete for all years. The number of aphids caught in the traps varied from week to week but tended to be greatest in the warmest part of the season. In 1961 there

Table 2. Flower production and CMV infection in weekly plantings of gladiolus at Farmingdale, N. Y. 1962.

Planting Date	Flowers Picked		
	Total No.	CMV Infested No.	%
March			
27	177	16	9
April			
3	192	12	6
10	182	8	4
17	164	8	5
24	161	12	7
May			
2	151	6	4
8	139	11	8
15	95	6	6
24	93	9	10
31	51	3	6
June			
7	54	19	35
15	87	22	25
22	55	24	44
29	86	45	52
July			
6	66	35	53
13	35	19	54
20	67	35	52
27	18	6	33

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Plant Gladiolus Early

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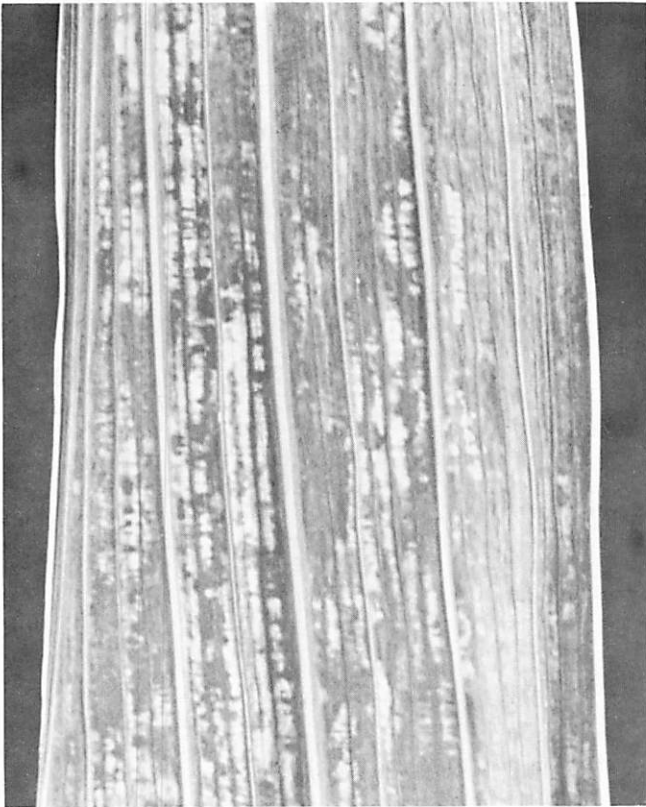


FIGURE 1. White speckled streaks on foliage of gladiolus variety Florentine infected with CMV.

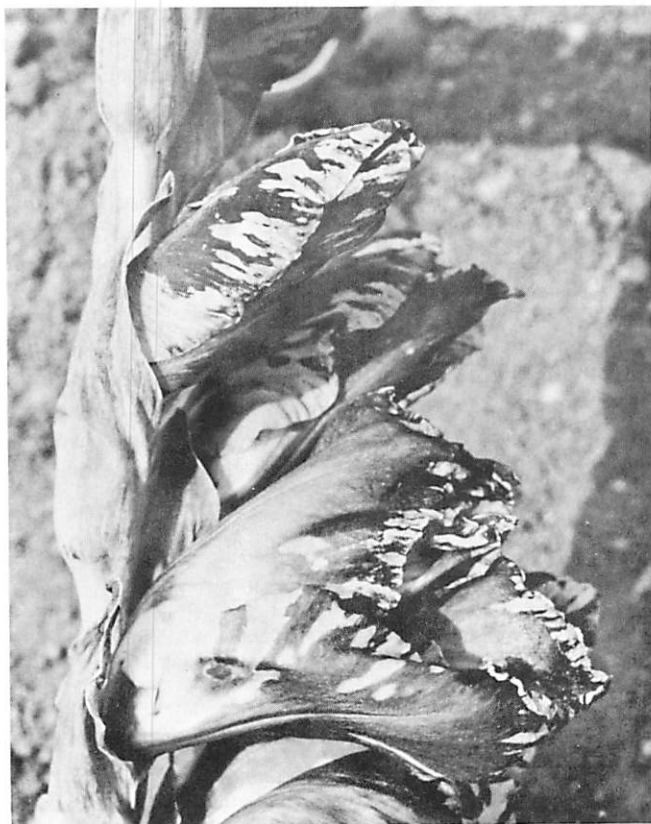


FIGURE 2. Infected flowers and buds of variety Spic and Span.



FIGURE 3. Infected vs clean flowers of variety Happy End. Color break in gladiolus flower petals of plants infected with CMV.

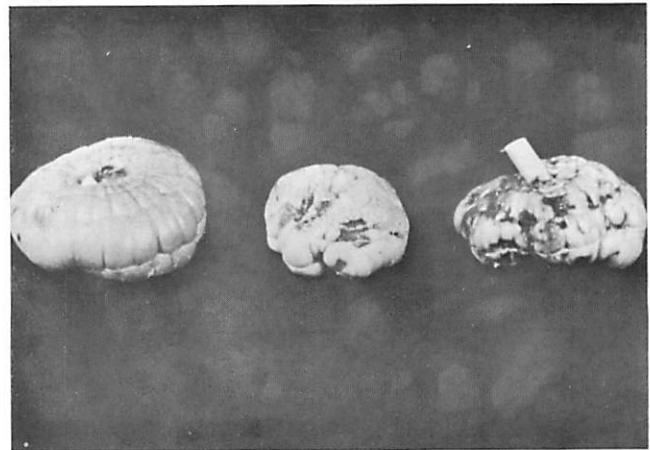


FIGURE 4. Wrinkled and pitted corms of variety June Wedding infected with CMV: left clean, middle infected, right severe symptoms of CMV infection.



FIGURE 5. Yellow pan water trap near gladiolus mulched with aluminum foil to repel aphids.

(continued on page 4)

Plant Gladiolus Early

(continued from page 3)

Table 3. Flower production and CMV infection in weekly plantings of gladiolus at Farmingdale, N. Y. 1963.

Planting Date	Flowers Picked		
	Total No.	CMV Infested No.	%
April			
5	174	22	13
11	156	13	8
17	168	13	8
24	171	35	20
May			
1	168	28	17
8	160	53	33
15	159	37	23
22	80	32	40
28	116	42	36
June			
6	104	43	41
13	117	50	43
19	140	53	38
26	135	71	53
July			
3	116	80	69
10	108	65	60
17	117	52	44

Table 4. Flower production and CMV infection in weekly plantings of gladiolus at Farmingdale, N. Y. 1964.

Planting Date	Flowers Picked		
	Total No.	CMV Infested No.	%
April			
23	69	18	27
May			
6	149	14	9
18	169	24	14
27	155	29	19
June			
3	224	39	17
10	181	51	28
18	203	40	20
25	256	79	31
July			
2	199	70	35
10	159	39	24
17	56	27	48

Table 5. Four year average of flower production and CWC infection in weekly plantings of gladiolus at Farmingdale, N. Y.

Planting Date	Flowers Picked		
	Total No.	CMV Infested No.	%
Early April	704	63	8
Late April	951	149	16
Early May	994	166	17
Late May	1163	207	18
Early June	934	245	27
Late June	885	314	36
Early July	734	330	45
Late July	265	123	46

Table 6. Number of aphids caught in yellow pan water traps placed near weekly plantings of gladiolus at Farmingdale, N. Y. 1961-64.

	Average Number of Aphids Per Trap			
	1961	1962	1963	1964
April				
1-15		0		
16-30		0		
May				
1-15		2		
16-31	17	310		
June				
1-15	156+ (a)	64+		
16-30	291+	84+		58+
July				
1-15	379	658		190
16-31	238	1076	177	140
August				
1-15	252	400	192	234
16-31	605	105	383	130
September				
1-15	600	157	150	51
16-30	210+	few	16	17
October				
1-15	256+			10+
16-31	82			
November				
1-15	80			

(a) plus sign (+) indicates some aphid loss from a pan used in determining that average.

was a peak in aphid population during late August and early September. In 1962 the peak came in July and early August. In 1963 the peak was in late August while in 1964 the peak was in early August. During the time of the large July and August winged aphid populations, late June and early July planted gladiolus are in a young shoot stage and probably attractive to aphids.

Because of the variability in the number of winged aphids and time of greatest population, the virus transmission will vary from year to year. But there is a good correlation between the spread of CMV in late plantings and the abundance of winged aphids at the time these plants are small.

Other Variables

Although CMV may possibly be spread to gladiolus from weeds and other crops in the immediate area a nearness to CMV infected gladiolus greatly increases the chance of infection. A study of the effect of distance was carried out and will be discussed in a later paper.

Literature Cited

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2. Brierley, P. 1962. Transmission of some gladiolus viruses on tools in harvesting flowers and corms. Plant Disease Repr. 46(7):505.
3. ———. 1963. Gladiolus cormels free from cucumber mosaic virus from infected parent corms. Plant Disease Reporter 47(10):863.
4. Moericke, V. 1951. Eine farbfaelle zur kontrolle des fluges von blattlausen insbesondere der pfirsichblattlaus, *Mysodes persicae* (Sulz.). Nachrichtenbl. den Deuts. Pflanzenschutzdienst. 3(2): 23-4.

New York State Cut Flower Survey*

The production of cut flowers in New York State is a large industry in which hundreds of growers are actively engaged. The gross wholesale value of sales of four cut flowers — carnations, chrysanthemums, gladioli and roses—totaled \$7,717,000 in 1965. New York State ranks fifth behind California, Florida, Pennsylvania and Colorado in value of sales.

Roses made up a large portion of the New York State total in 1965 with sales of \$3,310,000. Next in order were standard chrysanthemums \$1,460,000, carnations \$1,313,000, pompon chrysanthemums \$1,284,000 and gladioli \$350,000.

Over the past five years changes in production have occurred in the New York State cut flower industry. The remaining parts of this report are devoted to the number of blooms sold by producers for each of the four cut flowers in Upstate New York and Long Island for the period from 1961 to 1965. The information relates to sales by commercial producers who produced and sold \$2,000 or more of cut flowers, nursery products and related plants in one year.

For this release, State funds were matched with Federal funds from the Consumer and Marketing Service, U.S.D. under provisions of the Agricultural Marketing Act of 1946. This report supplements the 1966 U.S.D.A. Cut Flower Report and additional information on production and sales for the 11 major producing states may be found in that publication.

CARNATIONS

The number of carnation blooms sold by commercial producers in New York State has declined steadily over the five year period from 1961 to 1965. Blooms sold in 1961 were 24,181,000 as compared to 19,550,000 in 1965. This is a decrease of 19 percent.

The major portion of this decrease occurred on Long Island where 3,801,000 fewer blooms were sold in 1965 than in 1961, a reduction of 22 percent. In Upstate New York, 830,000 or 12 percent fewer blooms were sold in 1965 than in 1961.

In 1965, New York State ranked fifth in sales of carnation blooms among the 11 major producing states in the cut flower survey.

Blooms Sold (1000)

	1961	1962	1963	1964	1965
Upstate	7,063	7,195	6,356	6,235	6,233
Long Island	17,118	17,019	15,146	14,356	13,317
Total	24,181	24,214	21,502	20,591	19,550

*From New York Crop Reporting Service—prepared by Wm. I. Bair, W. C. Evans, S. W. Crane, Statisticians

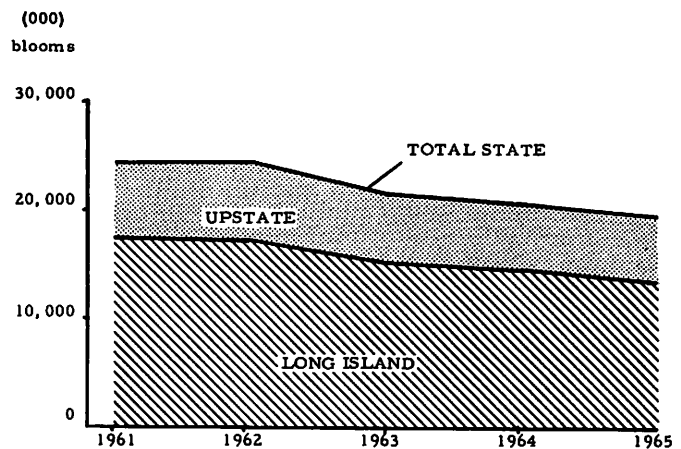


Table 1. Sale of Carnations

STANDARD CHRYSANTHEMUMS

Sales of standard chrysanthemum blooms by New York State producers totaled 6,176,000 in 1965. This is 10 percent less than the level attained in 1961. Sales of blooms have increased over the past 2 years however, with 509,000 more blooms sold in 1965 than in 1963.

In Upstate New York, 706,000 fewer blooms were sold in 1965 than in 1961. On Long Island the sales of standard chrysanthemum blooms were greater in 1965 than for any of the four preceding years. Upstate New York produced nearly 60 percent of the blooms sold in 1965.

New York State ranked fourth among the 11 major producing states in sales of standard chrysanthemum blooms in 1965.

Blooms Sold (1000)

	1961	1962	1963	1964	1965
Upstate	4,322	3,574	3,475	3,686	3,616
Long Island	2,540	2,280	2,192	2,411	2,560
Total	6,862	5,854	5,667	6,097	6,176

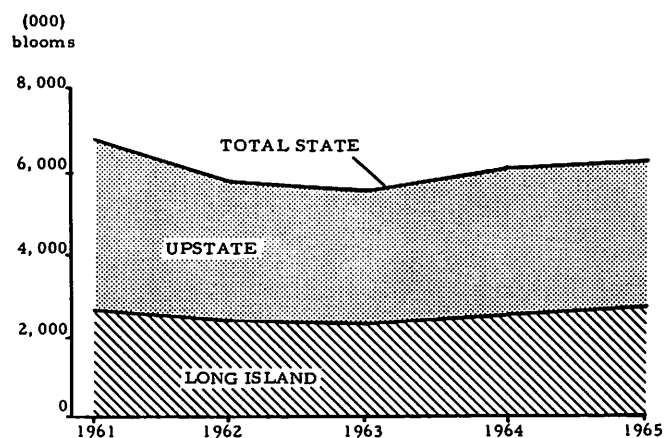


Table 2. Sale of Standard Chrysanthemums

POMPON CHRYSANTHEMUMS

New York State has shown a steady decrease in the number of bunches of pompon chrysanthemums sold by producers over the last 5 years. Sales in 1961 of 1,327,000 bunches were 21 percent less than the sales in 1961.

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New York State Cut Flower Survey
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The decline was about equal in both areas of the state with Upstate New York showing a decrease of 20% from 1961 to 1965 and Long Island showing a 22% decrease over the same period of time.

Among the 11 major producing states, New York ranked fifth in the number of bunches of pompon chrysanthemums sold in 1965.

Bunches Sold (1,000)

	1961	1962	1963	1964	1965
Upstate	933	828	869	782	747
Long Island	743	795	605	648	580
Total	1,676	1,623	1,474	1,430	1,327

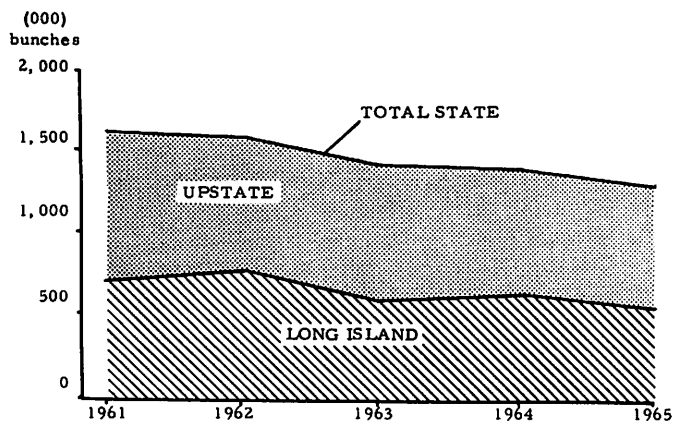


Table 3. Sale of Pompon Chrysanthemums

GLADIOLI

Sales of gladioli spikes by producers in New York State were 713,000 dozen in 1965, 17 percent less than the sales in 1961. Sales dropped off sharply in 1964. Part of this loss was recovered in 1965 with an 8 percent increase in sales over the previous year.

Upstate New York produces the majority of gladioli spikes in the states, and accounted for 93 percent of the spikes sold in 1961 and 97 percent of those sold in 1965. Sales on Long Island in 1965 were less than a third of the level attained in 1961.

New York ranked sixth among the 11 major producing states in sales of gladioli spikes in 1965.

Dozen Spikes Sold (1,000)

	1961	1962	1963	1964	1965
Upstate	800	906	932	629	693
Long Island	61	44	33	32	20
Total	861	950	965	661	713

ROSES

The number of rose blooms sold by producers in New York State totaled 28,876,000 in 1965, 12 percent less than the sales level in 1961. Sales of rose blooms fell 3,157,000 from 1961 to 1962, but dropped only 890,000 from 1962 to 1965.

The decline in sales from 1961 to 1965 was about even in both areas of the state. Sales of blooms produced in Upstate New York dropped 12 percent over the five year period, while Long Island sales dropped 13 percent. Upstate New York produced 56 percent of the blooms sold in 1965.

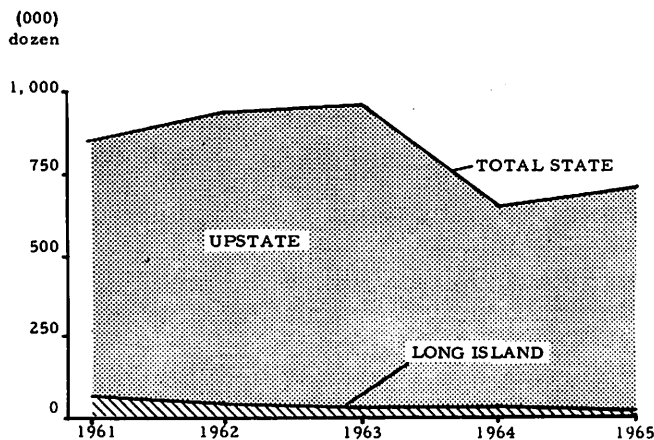


Table 4. Sale of Gladioli

Among the 11 major producing states, New York ranked fourth in the production of rose blooms last year.

Blooms Sold (1000)

	1961	1962	1963	1964	1965
Upstate	18,380	16,144	16,576	17,292	16,231
Long Island	14,543	13,622	14,533	13,221	12,645
Total	32,923	29,766	31,109	30,513	28,876

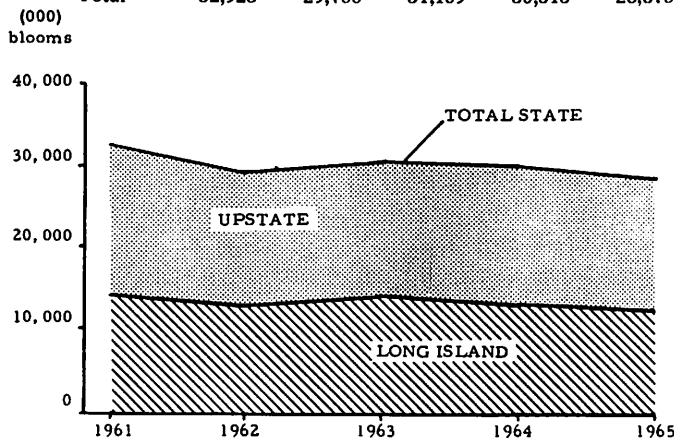


Table 5. Sale of Roses

Carnation Leaf Analysis

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the Department of Floriculture, College of Agriculture. The leaf samples will be analyzed for 13 different nutrient elements. Recommendations on the basis of the nutrient content of the leaves will be made to flower growers. In addition, a soil sample taken at the same time as the leaf sample will be analyzed.

The cost of the service for a leaf analysis and soil analysis is \$6.00. Leaf analysis kits will be available only from the Department of Floriculture, Plant Science Building, Cornell University, Ithaca, New York. To obtain a leaf analysis kit, a check or money order for \$6.00 payable to Cornell University should be sent to the Department of Floriculture and Ornamental Horticulture requesting Carnation Leaf Analysis Kit.

Complete directions on how to take the sample and prepare it for shipment are contained in each of the kits.

It is hoped that growers will avail themselves of this service to improve the quality of the highly important crop that is grown in New York State.

Posies, Petunias and Potted Plants*

The Retail Florist Industry is comprised mainly of small, but hardy, businesses . . . in contrast to the trend toward consolidation and bigness in other retail industries. Current estimates indicate that there are about 22,000 florists in the United States, and that they account for sales in excess of a billion dollars annually. Two out of every three florists have businesses with annual sales of less than \$50,000 . . . sales that represent less than one-third of total sales of the industry. Nearly a fourth of the businesses are of medium size; their annual sales of \$50,000 to \$100,000 account for 30 percent of total sales. About one out of nine florists has annual sales of \$100,000 or more and is classified as large or very large. However, this relatively small number of florists account for nearly 40 percent of the industry's sales.

A significantly large proportion of all florist shops have full-time managers and, except for some of the very large shops, the managers are also the owners. Only about 1 out of 11 shops has a hired manager.

Although there has been a significant upward trend in remodeling florist shops since 1959, less than two-thirds of them have been remodeled during the past decade. About half of the remodeling involves enlarging the shop or some parts of it and about one-third consists of modernizing and redecorating.

Formal training of employees is not widely practiced by florists. About one-fourth provide such service for their employees. An important source for training is the classes conducted or provided by wire service organizations.

U.S. florists conduct about three-fourths of their business by telephone and many of their clients are only names and voices to them. To service such clientele, florists provide considerable customer service. For example, 84 percent offer flowers-by-wire service, 95 percent offer credit, and 97 percent offer free delivery.

Air-conditioned shops are not too prevalent in the industry. Only about 40 percent have all or part of their shops air-conditioned. Air-conditioned delivery vehicles are even more rare: only 13 percent of the florists have them.

Florists' credit policies are probably the most liberal of all the retail businesses in the United States. Moreover, only 12 percent of the florists add a service charge to accounts considered past due.

More than half of the florists who are members of a wire service belong solely for the sales benefits generated by wire orders. Over half the members charge a fee for placing orders by wire, and at least 40 percent of those who do have experienced customer objections to the added fee.

Nearly three-fourths of the florists advertise in paid media one or more times a year. Over a third feature spe-

cific floral products in their advertisements. Newspapers are the most popular medium used by florists to inform customers of items featured; nearly 40 percent advertise in this way. Other frequently used media are window signs, radio and direct mail.

With respect to merchandising, a great majority (86 percent) of florists use floral displays in their shop windows as a sales stimulant. In-store customer traffic is favored by over three-fourths of U. S. florists for this use; less than 60 percent consider the use of in-store point-of-purchase (POP) advertising materials effective. More than two-thirds of all florists are satisfied with POP materials available to them.

Less than 40 percent of the florists display prepared arrangements in their shops for customers to see and buy when placing an order in person. This practice is more prevalent among large and very large florists. Over three-fourths of the florists who display floral arrangements put a price on them for customers to see.

Nearly 40 percent of the florists charge the same price for arranged as for unarranged flowers. The majority encourage customers to buy accessories with their flower purchases. In addition, many give flower purchases some accessories free.

About 80 percent of all florists price mark most items displayed for sale in their shops; however, relatively few offer perishables to customers on a self-service basis. Plants are more commonly sold self-service than cut flowers.

Nearly 70 percent of the florists are located near mass market outlets that sell floral products. Nearly two-thirds (64 percent) of the florists consider mass outlets detrimental to regular florists' sales, less than one-third feel that their sales are unaffected by mass outlets, and 1 florist in 15 considers mass market outlets a stimulant to regular florists' sales.

Artificial flowers and plants represent about 7 percent of florists' sales and are handled by a very high proportion of U. S. florists. A significant portion of the artificial flowers purchased are used in the home. Other uses are for memorials, hospitals and commercial establishments such as apartment houses, hotels, restaurants and offices.

Nearly one-half of the florists rely on their suppliers for primary information about product availability. About one in five obtains information from printed media and one in four seeks out his own source by telephoning other retailers or suppliers, or visiting the market regularly. Only about one florist in nine is dissatisfied with present sources of supply information.

Less than 10 percent of the florists receive their floral supplies on a c.o.d. basis and in most instances, at their own request. However, about one out of five c.o.d. shipments appears to be due to delinquent payment.

Wholesalers' credit policy to retailers is even more liberal than retailers' policy to customers. Only about 1 florist in 15 is penalized by his supplier for delayed payment of bills, but over one-fourth of all florists are offered a

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*Reprinted from the New England Farm Finance News, Volume 21, No. 2, Feb. 1966.

Posies, Petunias and Potted Plants (continued from page 7)

discount by suppliers for prompt payment.

About one-third of U.S. florists borrow money to finance their operations; very few reported difficulty in obtaining adequate financing. Most difficulties stem from (1) insufficient collateral; (2) poor profit position for current or previous years' operations; and (3) lack of adequate records to show the financial condition of the applicant.

The most frequent use of loans was for working capital; borrowed funds were also used for remodeling or expanding existing shops, financing new shops, or moving to new locations.

Pridham Receives Extension Award of Merit (continued from page 1)

plantings. Professor Pridham, although responsible for extension efforts in the broad areas of nursery production and arboriculture, added a devoted and detailed personal effort to research and field test chemical control of three problem weeds. The highly effective technological, chemical and cultural tools for controlling Japanese bamboo, Artemisia and Quackgrass are now, with Dr. Pridham's encouragement, an essential part of many schedules of commercial nurseries. For this Lambda Chapter, Epsilon Sigma Phi, recognizes Dr. Alfred M. S. Pridham, Professor of Ornamental Horticultural at the New York State College of Agriculture.

Pot Mum Contest

Sam Rao, manager of the New York State Flower Growers' exhibit at the State Exposition, announced a new Pot Mum Contest for our exhibit. Growers from all over New York State are invited to participate for prizes.

The contest rules allow for the use of 5 cuttings of any Standard variety grown in a 6" pot and given no more than one pinch. Additional information can be obtained from Sam Rao, Corner of Onondaga and Myron Roads, Syracuse 9, New York.

Short Takes

Jim Boodley

Your New York State Flower Growers Association has renewed its subscription to Weather Trends Incorporated. Weather Trends is a weather forecasting service that provides a 30-day forecast of temperature and precipitation. The forecasts are deemed to be 85% accurate and certainly are of extreme importance to flower growers. The prognostications indicate changes in temperature and cold spells which can mean a great deal to a flower grower programming his crop.

The rate of subscription to members of the New York

State Flower Growers is only \$6.00 for the year. This is \$.50 a month which is an extremely small amount for a fine service provided by your Flower Grower organization.

Miyazaki Awarded Trophy

Charles Miyazaki, chrysanthemum grower from Babylon, L. I., New York—a former board member of the New York State Flower Growers—has been awarded the President's Trophy of the New York Florists' Club. This award is given to the grower with the highest number of points in the exhibiting for the 1965 year.

Our congratulations to Chuck—this is the second year for this award.

Review of Papers

WHITE PETUNIA IS BEARING BRUNT OF OUR POLLUTED AIR

Brennan, E., I. Laone, R. H. Daines and A. Mitlehner
(New Jersey Agriculture 48#1:8-11. 1966)

Petunia plantings last year showed symptoms of air pollution damage. Middle aged leaves became water-soaked; and upon further exposure to sunlight, upper surfaces developed more or less "necrotic" (dead) bands and the lower surface had a glazed appearance.

Petunias with colored flowers were not sensitive. White varieties listed as sensitive to the pollutant were Alaska, Albatross, Mikado, Paleface, Seafoam, Sonata, Snowcap, Snowdrift, Snowstorm, White Frills, White Magic, White Sails and White Riches. Succulent plants were more severely injured than those "hardened" by outdoor growing conditions.

—J.G.S.

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- Pot Plant Contest
- Short Takes
- Miyazaki Awarded Trophy
- Review of Papers

YOUR EDITOR,

Bob Laughans