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ANNUAL REPORT ON RESEARCH PROJECTS

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BY

J. M. JENKINS, JR.

Gladiolus Breeding

As a result of the breeding program with gladiolus which was started in 1962 a large number of seedlings and selections are now being grown. In 1966 and 1967 backcrosses were made to parent varieties, and selected seedlings were also self-pollinated or crossed with other varieties having desirable characters.

Ethylene chlorohydrin was used successfully to break dormancy of newly dug seedling cormels. Seeds from crosses that had been made in June 1966 were planted in the greenhouse immediately after they had matured. Plants from these seedlings produced cormels which were dug in the early spring of 1967. The cormels were dug, treated with ethylene chlorohydrin, and replanted in the field within 5 days. This planting was blooming by the end of June, 1967. Thus, by using ethylene chlorohydrin to break the dormancy of the cormels, it was possible to produce flowering plants within one year from the time the crosses were made. This procedure will greatly accelerate the gladiolus breeding program because it will no longer be necessary to wait two to three years to make selections following crosses.

Tests were also conducted on the use of ethylene chlorohydrin to break the dormancy of large corms so that spring grown corms could be replanted for a fall crop. Results of these tests were somewhat variable, but indications are that

this procedure can be followed successfully provided the corms are dug prior to July 15 and the chemical treatment is used immediately after the corms have been dug. Corms dug July 25 and replanted on August 1 bloomed starting November 1 but were killed by frost on November 7.

Selections that have been made to date are being grown and compared with standard varieties. They will also be tested for disease resistance. The best of these selections will be increased as rapidly as possible and will be thoroughly field tested for possible release when sufficient stock is available. Any variety that is released will necessarily meet the requirements for a "good commercial" variety.

Variety Test with Gladiolus

A list of the gladiolus varieties tested in 1967 together with data on flower color, spike length, and date of bloom are given on pages 6-8. The best varieties from a commercial standpoint are marked with an asterisk. Although all of the varieties that are suitable for commercial use are susceptible to Fusarium, Stromatinia, and other diseases they are being used because suitable resistant varieties are not available. As new varieties are developed by breeders in other parts of the country many of them are tested at this station to determine if any of them have resistance to disease. It is hoped that resistant varieties will become available as a result of numerous breeding programs because resistance would reduce costs of production quite considerably.

Gladiolus Spacing Test

The customary spacing for gladiolus plants in the row is 4 to 5 corms per foot in single rows spaced 30 to 40 inches apart. This method of spacing has been used for many years and is satisfactory where gladiolus are grown on ordinary field soil.

In recent years it has become necessary to fumigate the land for gladiolus in order to get maximum production. The soil is fumigated to control diseases, nematodes, and weeds, and planting stock from hot-water treated cormels is used. Recently, one or two growers have started fumigating the land for blooming sized gladiolus and in these fields they have been spacing the plants much closer together. When using the old method of spacing approximately 60,000 corms are required to plant an acre. On fumigated land, corms must be planted closer together to make more efficient use of the land which is expensive to fumigate, and also because fumigation permits closer planting by eliminating weeds and the need for cultivation. Growers have been planting from 120,000 to 140,000 corms per acre on fumigated land, but they have had no field comparisons of different spacings. An experiment was started in 1967 to determine just how closely plants could be spaced without affecting the height or quality of the flower spikes or the production of new corms.

The test consisted of 7 spacings including the traditional single row; double rows spaced 8, 10, 12 inches apart on one bed; three rows on a bed spaced 6 inches apart; 4 rows spaced 12 inches apart on a wide bed; and a single "matted row" in which corms were placed touching one another in a band 6 inches wide on a single row. In all of these spacings ^(except matted row) a rate of 5 corms per foot of row was used. There were four replications of each treatment. The yields of flower spikes ^{and other data} are given in the accompanying table: (Tables 1+2)

These data indicate that any of the spacings used, except the matted row, will produce spikes that are just as good in quality as the usual single row method of growing. The number of spikes produced, the height of the spikes, and the weight of the spikes was satisfactory in all of the spacings except the matted row.

The main difference observed among the different plots was the fact that it was easier to cut the flower spike from single or double rows. Where 3 or 4 rows were planted on one bed it was more difficult to cut the flower spikes without occasionally breaking the tips off of some of the plants on the outer rows. This would not be a serious problem, however, once a crew of workers became accustomed to cutting flowers under these conditions.

Herbicide Tests with Gladiolus

Herbicide tests with gladiolus were continued in 1967 in cooperation with members of the staff of the Horticultural Department. These tests again indicated that trifluralin and diuron will give good weed control when properly applied under suitable weather conditions. Other materials were tested. Results of these tests will be reported elsewhere.

Vegetable Variety Tests

Vegetable variety tests during the past year were conducted mainly with varieties that are considered to be suitable for processing. The primary purpose of the tests is to obtain data on yields, time of harvest, and processing quality

of varieties that grow well in North Carolina. This information will be needed by companies planning to establish plants in southeastern North Carolina for the purpose of processing vegetables. Vegetable crops included in variety tests this past year were: bush beans, spinach, cauliflower and tomatoes. Results of these tests are given on pages

11-23.

Table - Flower Colors, blooming dates, and spike lengths of gladiolus varieties tested in 1967 at Castle Hayne.

| Variety | Color | Date Bloomed ^{1/} | Spike Lengths |
|-------------------|--------------------------|----------------------------|---------------|
| Advance | Red | 6/5 | 33-37 |
| Ajax | Medium Red | 6/5 | 39-40 |
| Allegretto * | Medium Red | 5/29 | 37-39 |
| All-N-Bright | Dark Red | 6/2 | 46-48 |
| Annebelle | Red | 6/5 | 37-39 |
| Appleblossom | White with pink edge | 6/5 | 34-36 |
| Ares | Cream with red throat | 6/1 | 40-42 |
| Artois | Pink | 6/5 | 34-36 |
| Beau Monde | Pink | 6/12 | 36-38 |
| Beverly Ann * | Lavender | 6/2 | 37-39 |
| Capital | Red with purple throat | 6/2 | 39-41 |
| Carrara | Cream | 6/2 | 40-42 |
| Chic de Paris | Medium Red | 5/31 | 33-35 |
| Christmas Red * | Red | 6/15 | 48-50 |
| Christmas White * | White | 6/12 | 43-45 |
| Cleopatra | White | 6/8 | 31-33 |
| Coral Ace | Coral Pink | 6/8 | 34-36 |
| Cosmopolite | Pink | 6/15 | 22-24 |
| Crescendo | Pink with white markings | 6/22 | 36-39 |
| Dixie Jewel | Pink | 6/8 | 43-45 |
| Dr. A. Verwey | Purplish Pink | 6/8 | 30 |
| Dr. Salk | Medium Red | 6/12 | 43-45 |
| Early Red | Red | 5/30 | 34-36 |
| Early Spring | Light Pink | 5/31 | 26-28 |
| Fiat Lux | Yellow | 6/5 | 37-39 |
| Fidelio | Purple | 6/8 | 46 |
| Flamingo | Orange Red | 6/12 | 34-36 |
| Florida Pink | Pink | 6/12 | 46-48 |
| Forest Fire | Red | 5/31 | 28-30 |
| Friendship * | Pink | 5/29 | 35-37 |
| Gail | Lavender | 6/16 | 36-39 |
| Gander | Dark Red | 6/12 | 34-36 |
| Golden Sunshine * | Yellow | 6/19 | 43-45 |
| Golden Treasure | Yellow | 5/19 | 43-45 |
| Green Ruffles | Greenish yellow | 6/19 | 47-49 |
| Green Satin | Green | 6/13 | 48-50 |
| Honesty | Light reddish purple | 6/2 | 36-38 |
| Hopman's Glory * | Yellow | 6/8 | 38-42 |
| Joli Coeur | Red | 5/25 | 34-36 |
| Jubilee | Pink with cream throat | 6/6 | 34-36 |
| June Bells * | White | 6/3 | 36-40 |
| Kiss Waltz | Red | 6/1 | 34-36 |
| Lavender Lace | Lavender | 6/12 | 34-36 |
| Leewenhorst | Pink | 6/2 | 34-36 |
| Liebesgrauss | Pink | 6/8 | 37-39 |
| Lilac Perfection | Purple | 6/6 | 37-39 |

* Commercial or commercial type.

^{1/} Planted February 15

| Variety | Color | Date Bloomed | Spike Lengths |
|----------------------|------------------------|--------------|---------------|
| Little Rock | Dark Red | 6/5 | 40-42 |
| Lucratief | Medium Red | 6/2 | 39-41 |
| Maid of Orleans | White | 6/8 | 37-39 |
| Mannequin | Purplish Pink | 6/13 | 28-30 |
| Maytime | Medium Orange Pink | 5/30 | 44-46 |
| Minaret * | Medium Pink | 5/25 | 46-48 |
| Modern Art | Purplish Pink | 6/8 | 35-37 |
| Moliere | Medium Red | 6/8 | 41-43 |
| Moonshot | Yellow | 6/5 | 38-40 |
| Morning Red | Medium Red | 6/8 | 34-36 |
| Mother Fischer * | White | 6/15 | 36-38 |
| Mrs. M. Markwood | White | 6/5 | 34-36 |
| Muscadet | Cream | 6/22 | 29-31 |
| My Lady | Light Purple | 5/31 | 39-41 |
| New York | Dark Red | 6/12 | 39-41 |
| Orange Gold | Orange | 6/15 | 41-46 |
| Orchid | Lavender | 6/2 | 36-38 |
| Picardy | Salmon Pink | 6/15 | 40-42 |
| Pink Supreme * | Medium Pink | 5/29 | 45-47 |
| President Kennedy | Medium Red | 6/22 | 36-38 |
| Prospector | Yellow | 6/15 | 36-38 |
| Red Emperor | Dark Red | 6/23 | 42-45 |
| Red Radiance | Red | 6/8 | 33-38 |
| Red Tomato | Red | 6/6 | 34-36 |
| Red Tornado | Medium Red | 6/10 | 46-48 |
| Riviera | Purple | 6/8 | 36-37 |
| Roman Holiday * | Red | 6/15 | 43-45 |
| Rose Spire | Pink | 5/16 | 39-41 |
| San's Souci | Red | 6/12 | 37-39 |
| Santos Dumant | Pink | 6/12 | 39-41 |
| Savannah | Dark Red | 6/12 | 48-50 |
| Sequea Dama * | White | 6/21 | 40-44 |
| Snow Ball | White | 5/26 | 31-33 |
| Snow Princess * | White | 5/26 | 34-36 |
| Spic & Span * | Pink | 6/12 | 34-36 |
| Summer Pride | Medium Red | 6/12 | 30-32 |
| Sunlight | Yellow | 6/2 | 34-36 |
| Tel Aviv | Red | 6/4 | 25-27 |
| Televisie | Red | 6/15 | 39-41 |
| Tequendama | White | 6/6 | 43-45 |
| Texas White | White | 6/19 | 39-41 |
| The Rajah | Dark Red | 5/19 | 41-43 |
| Topaz * | Yellow | 6/8 | 37-39 |
| Traveler * | Pink | 5/31 | 37-39 |
| United Europe | Pink | 6/12 | 37-39 |
| Valeria * | Red | 6/5 | 37-39 |
| Van Meegren * | Yellow | 6/5 | 32-34 |
| Van Zanten's Glory * | Medium Lavender | 6/12 | 48-50 |
| Vinks Glory | Yellow | 6/12 | 37-39 |
| White Excelsior | White | 5/25 | 36-38 |
| White Friendship | White | 5/27 | 38-40 |
| Wild Rose | Pink with cream throat | 5/31 | 39-41 |

| <u>Variety</u> | <u>Color</u> | <u>Date Bloomed</u> | <u>Spike Lengths</u> |
|----------------|--------------|---------------------|----------------------|
| London * | Medium Red | 6/12 | 46-48 |
| T590 * | Yellow | 6/19 | 53-55 |
| T500 * | White | 5/26 | 40-46 |

Table / - Flower spike data from different row spacings (Friendship variety)

| TREATMENT | SPIKE YIELDS (Percentage of corms planted) | SPIKE WEIGHTS (Grams) | SPIKE LENGTHS | HEAD LENGTHS |
|--------------------------------------------------------------------|--------------------------------------------------|--------------------------|---------------|--------------|
| Single rows 3' apart | 98.33 | 101.25 | 44.90 | 20.71 |
| Double rows 12" apart | 88.58 | 97.37 | 44.27 | 19.37 |
| Double rows 10" apart | 93.16 | 104.02 | 45.24 | 20.12 |
| Double rows 8" apart | 89.16 | 99.95 | 44.73 | 19.62 |
| Triple rows 6" apart | 89.44 | 86.13 | 43.39 | 17.63 |
| Quadruple rows 12" apart | 90.54 | 94.19 | 45.24 | 19.10 |
| "Matted row 15 corms per foot of row in a band 6" wide | 87.94 | 74.46 | 42.36 | 16.65 |
| LSD, .05 | 5.28 | 10.38 | 2.12 | 1.27 |
| LSD, .01 | 7.23 | 14.21 | 2.91 | 1.74 |

Table 2 - Comparison of number of corms required and
flower spike yields per acre from different
methods of row spacing. (Friendship variety)

| TREATMENT | TOTAL WIDTH OF ROW OR BED | NO. OF CORMS PLANTED PER ACRE* | FLOWER SPIKE YIELDS PER ACRE (Dozens) |
|---------------------------------------------------|------------------------------|-----------------------------------|---------------------------------------------|
| Single row, 3' apart | 3' | 72,600 | 5949 |
| Double rows, 12" apart | 4' | 108,840 | 8034 |
| Double rows, 10" apart | 3' 10" | 113,640 | 8822 |
| Double rows, 8" apart | 3' 8" | 118,800 | 8826 |
| Triple rows, 6" apart | 4' | 163,260 | 12,168 |
| Quadruple rows, 12" apart | 6' | 145,200 | 10,955 |
| Matted row (15 corms per foot in band 6" wide) | 3' | 217,800 | 15,961 |

* At 5 corms per foot.

NOTE: There was 36" between outer rows in all treatments.

SNAP BEAN VARIETY TESTS, CASTLE HAYNE

The bean varieties tested in 1967 were considered to be suitable for processing. Two pickings were made of each variety (except Early Gallatin which was picked once before any of the other varieties were picked.) On the last picking, June 26, all of the pods were removed from the plants and were included in the weights given in Table 3. Samples of each variety were sent to the Food Science Department at Raleigh for processing and further study.

Varieties producing the highest yields per acre included Cascade and Early Gallatin. Yields of more than 9 tons per acre were obtained. Sprite and Pearlgreen gave the lowest yields, 5.8 and 6.4 tons per acre. Other varieties yielded from 7.5 to 8.4 tons.

The sieve sizes of representative samples ~~were~~ taken on two different dates are given in Table 4.

The results of two years' experiments indicate that most of the varieties tested would be suitable for processing, and that yields of the better varieties would be high enough for profitable production.

Table 3 - Mean yields of 10 snap bean varieties in tons per acre, Castle Hayne, 1967.

| | <u>6/14</u> | <u>6/19</u> | <u>6/26</u> | <u>Totals</u> |
|-----------------------|-------------|-------------|-------------|---------------|
| Corneli 14 (107-403) | | 5.8 | 1.7 | 7.5 |
| Cascade (146-13) | | 6.2 | 3.2 | 9.4 |
| KB-2 (100-354) | 3.3 | 3.4 | 1.3 | 8.0 |
| Slenderwhite (148-15) | | 6.5 | 1.9 | 8.4 |
| Harvester | | 4.6 | 2.7 | 7.3 |
| Sprite | | 3.6 | 2.2 | 5.8 |
| Pearlgreen | | 3.6 | 2.8 | 6.4 |
| Early Gallatin | | 7.6 | 1.6 | 9.2 |
| Valgreen | | 5.5 | 2.4 | 7.9 |
| Bush Blue Lake | | 3.0 | 4.9 | 7.9 |
| LSD, .01 | | 1.7 | 1.2 | 1.7 |
| LSD, .05 | | 1.3 | .9 | 1.2 |

Table 4- Percentage of each sieve size of pods from 10 different bean varieties sampled on 2 dates of harvest.

| No. | Variety | 1 | 2 | 3 | 4 | 5 | over 5 | Total No. pods graded ^{1/} |
|----------------|------------------------------|----|----|----|----|----|--------|-------------------------------------------|
| <u>June 16</u> | | | | | | | | |
| 1 | Corneli 14 (107-403) | 22 | 11 | 22 | 34 | 11 | | 153 |
| 2 | Cascade (146-13) | 51 | 12 | 14 | 19 | 4 | | 310 |
| 3 | KB-2 (100-354) ^{2/} | 41 | 13 | 16 | 18 | 12 | | 122 |
| 4 | Slenderwhite (148-15) | 35 | 14 | 29 | 20 | 2 | | 263 |
| 5 | Harvester | 58 | 22 | 18 | 1 | 0 | | 208 |
| 6 | Sprite | 61 | 20 | 18 | 1 | 0 | | 235 |
| 7 | Pearlgreen | 7 | 12 | 21 | 51 | 9 | | 68 |
| 8 | Early Gallatin | 49 | 10 | 15 | 23 | 3 | | 210 |
| 9 | Valgreen | 42 | 7 | 27 | 24 | 0 | | 235 |
| 10 | Bush Blue Lake | 79 | 19 | 2 | 0 | 0 | | 148 |
| <u>June 26</u> | | | | | | | | |
| 1 | Corneli 14 (107-403) | 31 | 14 | 6 | 9 | 16 | 24 | 118 |
| 2 | Cascade (146-13) | 41 | 9 | 6 | 14 | 21 | 9 | 114 |
| 3 | KB-2 (100-354) | 30 | 5 | 8 | 14 | 18 | 25 | 84 |
| 4 | Slenderwhite (148-15) | 36 | 10 | 12 | 23 | 17 | 2 | 114 |
| 5 | Harvester | 22 | 5 | 15 | 29 | 28 | 1 | 94 |
| 6 | Sprite | 9 | 12 | 26 | 51 | 2 | 0 | 95 |
| 7 | Pearlgreen | 6 | 7 | 20 | 38 | 23 | 6 | 71 |
| 8 | Early Gallatin | 34 | 8 | 4 | 20 | 30 | 4 | 114 |
| 9 | Valgreen | 29 | 9 | 14 | 30 | 14 | 4 | 130 |
| 10 | Bush Blue Lake | 12 | 15 | 14 | 24 | 19 | 16 | 74 |

^{1/} Pods harvested from 8 plants for each sample.

^{2/} Had been picked June 14 (before sieve size samples were taken on June 16)

Cauliflower Variety Test

A cauliflower variety test this year was not entirely successful due to the fact that an early freeze stopped production before all of the plants had produced heads. However, data were obtained on the relative earliness of the different varieties, early yields, and average head size. This is given in Table 5. Notes were also taken on plant vigor, plant and head characteristics, and diseases.

The varieties were started from seed sown in the greenhouse on July 5, the plants were potted July 24, and they were set in the field on August 15. Dry weather in September and October probably caused the crop to develop more slowly than normal, although irrigation was used during the latter part of the growing season. The first cutting was made on October 23. Harvest continued at intervals until December 1 although no heads were harvested for a two weeks period in mid-November following minimum temperatures of 20 and 19 degrees F. on November 8 and 9.

Earliest varieties were strains of Super Snowball A, and one strain of Snowdrift. The other strain of Snowdrift was very late and appeared to be an entirely different variety. It produced no heads. The better strains of Super Snowball A produced yields ranging from 7 to 8 tons per acre. The yields could have been much higher under somewhat more favorable conditions of temperatures and moisture.

Other Snowball strains and varieties and Improved Holland Erfurt were later than Super Snowball A and made much lower yields.

The head sizes of the various varieties ranged from 3.2 to 4.9 pounds. The average size of Super Snowball A was in the 3.2 to 3.6 pound range. The quality of the cauliflower produced in these tests was excellent.

It was evident from the results obtained that this crop can be produced successfully in coastal areas in the fall.

Table 5 - Cauliflower Variety Test, Castle Hayne

| | <u>Total No. Heads</u> | <u>Total Weight</u> (lbs.) | <u>Average</u> <u>Head Wt.</u> (lbs.) |
|-------------------------------------------------|------------------------|-------------------------------|---------------------------------------------|
| Super Snowball A ^{6/} | 22 | 86.4 | 3.9 |
| Snowdrift ^{1/} | 19 | 76.7 | 4.0 |
| Early Snowball A (Super Snowball) ^{3/} | 22 | 70.9 | 3.2 |
| Super Snowball ^{4/} | 21 | 68.7 | 3.3 |
| Super Snowball ^{1/} | 18 | 64.7 | 3.6 |
| Improved Super Snowball ^{2/} | 16 | 56.1 | 3.5 |
| Snowball Imperial ^{4/} | 10 | 47.4 | 4.7 |
| Snowball E ^{3/} | 10 | 45.2 | 4.5 |
| Snowball M ^{3/} | 10 | 39.6 | 4.0 |
| Snowball #16 ^{1/} | 8 | 30.3 | 3.8 |
| Snowball Y ^{3/} | 7 | 25.0 | 3.6 |
| Snowball X (Snowdrift) ^{3/} | 5 | 24.4 | 4.9 |
| Improved Holland Erfurt ^{2/} | 1 | 4.0 | 4.0 |
| Snowdrift ^{2/} | 0 | 0 | 0 |

NOTE: About 5% of plants were lost due to soil-borne diseases after setting in the field. (Rhizoctonia)

1/ Northrup, King

2/ Burpee

3/ Ferry-Morse

4/ Harris

5/ Cornelli

6/ Asgrow

NOTE: An early freeze stopped production before all of the plants produced mature heads.

Spinach Variety Tests

Plots for spinach were limed and fertilized on the basis of soil tests and other information. The first planting was made on October 12, 1966 and the second on October 28. A poor stand was obtained from the second planting so it was replanted on November 15. A spring planting of the same varieties was made on March 13, 1967, primarily to check on dates of bolting of the different varieties. Table 6 shows the percentage of plants that had bolted on the dates indicated. It also includes data on plant height, leaf spread, and leaf color.

The varieties were rated on size, vigor, and leaf color when they reached marketable size and before they began to bolt. Hybrid #7 produced the largest, most vigorous plants in the October 12 and November 15 plantings and also had the best color. This variety grew off rapidly and seemed to be better adapted than the two America varieties.

Hybrid #56 was rated second to Hybrid #7. It bolted more rapidly than any of the others, however, so would have to be harvested as soon as it reached a marketable size. Chesapeake was rated third; Old Dominion, fourth; America 276 x 274, fifth; and America, sixth.

In the March 13 planting Old Dominion grew off very rapidly and produced plants twice as large as any of the other varieties by May 1. It was rated as the best variety in the spring planting although it bolted earlier in May than other varieties. Chesapeake and Hybrid #56 were the other two varieties that showed promise for spring planting. The two America varieties and Hybrid #7 grew very slowly in the spring and produced small plants. They were slow to bolt but had not reached a marketable size by the time hot weather caused them to die.

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Yields were taken on the two fall plantings which were over-wintered and harvested in April. ^(Table 7) Highest yields were obtained from Hybrid #7 and Hybrid #56 in both plantings. The October 12 planting gave slightly higher yields than the November 15 planting with all varieties tested.

Conclusions

Hybrid #7 was selected as the best of those tested on the basis of yield, leaf color, and quality. It was more resistant to bolting than Hybrid #56 and Old Dominion but less resistant than the two America lines. The "Americas" were lighter green in color and produced lower yields than Hybrid #7.

(Spinach varieties will be tested again in 1967. The same varieties will be tested and three plantings will be made between October 15 and November 15.)

Table 6 - Comparative data on 6 spinach varieties grown at Castle Hayne

| Date Planted | Variety | Percent Bolting | | | | | | Average Plant Height (Inches) | Average Leaf Spread (Inches) | Relative Color |
|-----------------|-------------------|-----------------|-----|------|------|------|------|----------------------------------------|---------------------------------------|----------------|
| | | 3/30 | 4/5 | 4/12 | 5/10 | 5/17 | 5/24 | | | |
| Oct. 12 | America | 0 | 0 | 0 | 15 | | | 5.0 | 6.5 | Light Green |
| Nov. 15 | | 0 | 0 | 0 | 1 | | | 4.0 | 6.5 | Light Green |
| March 13 | | - | - | 0 | 0 | 0 | 1 | | | |
| Oct. 12 | America 276 x 274 | 0 | 7 | 12 | 18 | | | 5.0 | 10.0 | Medium Green |
| Nov. 15 | | 0 | 0 | 5 | | | | 5.5 | 9.5 | Medium Green |
| March 13 | | - | - | 0 | 0 | 0 | 2 | | | |
| Oct. 12 | Chesapeake | 0 | 0 | 12 | 80 | | | 8.5 | 12.0 | Medium Green |
| Nov. 15 | | 0 | 0 | 2 | 5 | | | 8.0 | 11.0 | Dark Green |
| March 13 | | - | - | 0 | 1 | 12 | 35 | | | |
| Oct. 12 | Hybrid #7 | 6 | 12 | 14 | 75 | | | 7.5 | 12.0 | Dark Green |
| Nov. 15 | | 0 | 1 | 5 | 15 | | | 8.5 | 12.0 | Dark Green |
| March 13 | | - | - | - | 0 | 0 | 2 | | | |
| Oct. 12 | Hybrid #56 | 15 | 25 | 55 | 96 | | | 10.0 | 11.0 | Dark Green |
| Nov. 15 | | 20 | 50 | 65 | 80 | | | 11.0 | 10.5 | Medium Green |
| March 13 | | - | - | - | 0 | 5 | 15 | | | |
| Oct. 12 | Old Dominion | 5 | 12 | 26 | 95 | | | 7.5 | 9.5 | Medium Green |
| Nov. 15 | | 0 | 4 | 10 | 75 | | | 7.0 | 8.5 | Medium Green |
| March 13 | | - | - | 0 | 1 | 15 | 55 | | | |

Table 7 - Spinach yields in tons per acre, Castle Hayne

| <u>Variety</u> | <u>First Planting</u> ^{1/} | <u>Second Planting</u> |
|-------------------|-------------------------------------|------------------------|
| Hybrid #7 | 7.77 | 7.20 |
| Hybrid #56 | 7.88 | 6.86 |
| America 276 x 274 | 6.50 | 5.00 |
| Old Dominion | 5.73 | 4.77 |
| Chesapeake | 5.39 | 5.00 |
| America | 5.36 | 4.58 |
| LSD, .01 | 1.12 | 1.03 |

^{1/} First planting: October 12; Second planting: November 15;
Harvested: April 5.

Tomato Variety Test

Seven varieties of tomatoes were tested this year for yield, fruit size, and general adaptation. The experiment was conducted on Portsmouth soil and the plants were spaced two feet apart in rows five feet apart. They were staked but not pruned. The plants were tied to the stakes so that the fruits were held off of the ground. (If this is not done severe losses usually result from soil-borne organisms, particularly during periods of wet weather.) Table gives the average weights of the seven varieties on each of the fourteen picking dates from June 30 to July 31. It also gives the mean yields in tons per acre of No. 1 fruits.

It should be noted that this was a late spring crop and that tomato harvesting would normally start several weeks earlier than June 30. The highest yields of No. 1 tomatoes was obtained from Hybrid Mid-Early which was obtained from the Peto Seed Company. This variety produced significantly higher yields than any other variety. The other varieties, with the exception of Homestead 24, produced approximately the same mean yields, ranging from 18.3 to 21.3 tons per acre. Homestead 24 yielded 14.5 tons per acre.

The mean weights of the No. 1 fruits did not vary as much during the season as might have been expected. The largest average fruits were usually produced during the middle part of the picking season. There were more smaller fruits on the first few pickings. Then the fruit size increased

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until the later part of July when the average size began diminishing again. The variation in fruit size would have been more pronounced if all of the fruits from each picking had been included. However, the data was taken only from No. 1s.

On the basis of this year's results Hybrid Mid-Early was selected as the best variety in the test from the standpoints of total yields, fruit size and overall adaptation. No critical tests of fruit quality were conducted but all of the varieties were considered to be acceptable for market use. Fruit color and shape was also satisfactory.

Table 9 - Average weights and yields of 7 tomato varieties tested at Castle Hayne

| Variety | Mean Weights of the Fruits (in pounds) on dates indicated | | | | | | | | | | | | | | Mean yields per acre in tons of No. 1's |
|---------------------|-----------------------------------------------------------|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|--------------------------------------------|
| | 6/30 | 7/3 | 7/5 | 7/7 | 7/10 | 7/12 | 7/14 | 7/17 | 7/19 | 7/21 | 7/24 | 7/26 | 7/28 | 7/31 | |
| Hybrid Mid-Early | .41 | .47 | .54 | .49 | .49 | .48 | .55 | .54 | .50 | .44 | .42 | .48 | .38 | .43 | 26.1 |
| Wonder Boy | .35 | .41 | .54 | .44 | .44 | .50 | .48 | .49 | .46 | .42 | .52 | .46 | .41 | .42 | 21.3 |
| Hybrid 6428 | .41 | .42 | .58 | .59 | .51 | .50 | .53 | .57 | .51 | .51 | .47 | .46 | .45 | .38 | 21.0 |
| Hybrid 6513 | .50 | .46 | .56 | .56 | .56 | .56 | .56 | .56 | .51 | .48 | .52 | .57 | .46 | .43 | 19.8 |
| Manapal | .39 | .39 | .33 | .50 | .42 | .49 | .44 | .40 | .41 | .38 | .39 | .46 | .37 | .35 | 19.1 |
| Marion | .36 | .39 | .43 | .38 | .41 | .46 | .46 | .40 | .37 | .39 | .38 | .47 | .38 | .38 | 18.3 |
| Homestead 24 | .32 | .41 | .45 | .46 | .41 | .42 | .45 | .36 | .34 | .33 | .35 | .39 | .38 | .33 | 14.5 |

LSD, .01

3.2