by both hereditary factors and growing conditions. While the slogan "Eat this because it is good for you" is not one that is calculated to guarantee the acceptance of a new variety, it is something that is important to the general health and as such is the proper concern of the plant breeder.

In this discussion of the breeding and testing of new vegetable varieties I have emphasized cooperation among those engaged in this work as one of the essential "facts of life." I favor cooperation not just because it might be a popular movement, but because it helps get results. Biological research is at least as complex as research in engineering and in the sciences of physics and chemistry. It is a considerable source of satisfaction that vegetable men in the South interested in the development of new varieties are finding a mutual advantage in the exchange of information and materials of aid in their research and that these are being handed on to the growers of Florida and other southern States as increased help in solving their common problems.

NEW VEGETABLE VARIETIES FOR FLORIDA

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Since 1944 the last information on vegetable varieties for the State of Florida was compiled, hundreds of new varieties and lines of vegetables have been tested and evaluated by experiment station workers in all vegetable growing areas in the State. Much of the information in this paper has been contributed by these investigators.

Plant breeders have placed much emphasis on resistance to plant diseases in the breeding of vegetables. The number of new varieties which have resistance to one or more serious diseases testifies to the great strides that have been made along this line. Resistance to disease (and in some instances to insects) is highly important. In fact in some areas it is absolutely necessary where soils have become so contaminated with destructive diseases that the growing of susceptible crops is no longer profitable. Rotation of crops on these lands tends to reduce the severity of infection on the next susceptible crop, but proves of little value if conditions are optimum for the development of disease. At present the only practical answer to the problem of infested soils is through resistant types.

Many modern vegetable varieties are not only resistant to soil-borne disease such as fusarium wilt, bacterial wilt, potato scab, etc., but also extremely resistant to diseases which cause leaf and fruit spots such as early blight, late blight, grey leaf spot, and so forth. One of the new cantaloupe varieties is even considered resistant to attack by aphids as well as the powdery mildew. The breeding of these characters into vegetables has required years of diligent work by the men responsible for the great advances that have been made. There are still many problems to be solved. Unfortunately many of the new varieties, especially those resistant to certain diseases, seem to be adaptable to a very limited area and environment. This seems to be especially true of tomatoes. Many new tomato varieties that seem to have nearly every desirable character such as multiple resistance to diseases, excellent quality and high yield capacity in the area of their conception, fail miserably in another area, often only a few miles away with

cultural practices and other environmental factors apparently identical with its home area. This fact is extremely discouraging but is a problem that must be solved. In order for a new variety to gain favor with seed producers and distributors, it must be adaptable to a fairly wide area and range of conditions. It would, of course, be impractical for seedsmen to handle a different line or variety for each locality.

This lack of general adaptability is reflected in the large number of recommended varieties in the following group of vegetables.

Beans:—Several new varieties of bush beans have proven superior to Tendergreen and Black Valentine. The most outstanding beans of the group are Contender, Top Crop and an unnamed variety No. 1515. All three of these are resistant to powdery mildew and mosaic. Contender and Top Crop have been outstanding in recent trials at Belle Glade, Homestead and Gainesville. No. 1515 is evidently adapted to a wide variety of soils and conditions as it has been grown successfully on sandy soils, the Gulf Coast, Gainesville and Plant City areas and the organic soils of the Everglades and the marl soils at Homestead. Although pod shape and yield capacity of these new varieties have proven satisfactory in tests, several workers have mentioned the fact that they show the undesirable characteristic of producing numbers of pods in contact with soil; but none have discarded the variety because of this fault. Cherokee Wax is still considered the best shipping variety of this type of bean.

There has been little progress in the development of new pole bean varieties. No. 191 and McCaslan have been superior to all others tested. The following new introductions have been tested at Gainesville and several other stations: Canfreeze, Green Savage and Alabama No. 1 Green Pod. All are prolific but lack the right pod characters to compete with the No. 191 type.

English Peas:—Dark Skin Perfection is being recommended in the Sanford area.

Southern Peas (Edible Field Peas):—This has been a sadly neglected crop and few references are found to desired varieties that can be grown except for use as cover crops. Many people do not realize that there are several varieties delectable to the palate when properly prepared. The most widely known variety is the Black Eyed Pea, but there are others which to the writer's taste are far superior. Those recommended for trial are Wood's Sumptious, Purple Hull, Brown Crowder, Blue Goose, Virginia Blackeye and Alabama Crowder.

Cabbage:—Markets for Florida cabbage show a decided preference for the small solid head type, such as the variety Copenhagen Market. The new variety Bonanza has been recommended as an outstanding variety for compactness, solidity and small core on organic soils, but is considered too late for the Homestead section.

The soil-borne disease Cabbage Yellows, is becoming more widespread throughout the state, hence varieties resistant to this disease are becoming more important. Soils once infested retain the disease and susceptible varieties should be avoided. The following yellows-resistant varieties are available for planting on diseased soils: Resistant Detroit (Early), Marion Market, Resistant Copenhagen Market(medium early) and Resistant Glory of Enkhuizen.

Cauliflower: — Holland Erfurt and Snowball X or Snowdrift are the varieties most commonly grown. A new variety Snowball Y is recommended for trial. Though several days later than the above, its upright non-spreading type of foliage protects curds until nearly grown. It is recommended for limited trials.

Broccoli:—Three new varieties are

recommended for trial when seed becomes available: Freezers, Midway and Texas 107. Texas 107 produced almost double the yield of others in trials. A light yellow tinge on buds is objectionable.

Lettuce:—Great Lakes and Imperial 44 are still the standard varieties.

Cucumbers:—Marketer (Early Green Market) is a widely adaptable variety and is considered the standard by growers and buyers in most sections. A new South Carolina variety named "Santee" has yield capacity superior to Marketer and fruits of good color with a slight flecking which is not serious. This line is not as resistant to downy mildew as Palmetto; both have a tendency to form hollow spaces inside of fruit.

Recommendations:—Marketer (Early Green Market) Santee for limited trial; and Palmetto for planting when spraying and dusting equipment is inadequate and control of downy mildew is a problem.

Eggplant:—Two new varieties, Florida Market and Florida Beauty recently introduced by the Florida Experiment Station, are resistant to all phases of the disease known as Phomopsis or Tipover. Though still segregating for fruit color and type these varieties are recommended for all eggplant-growing sections. Florida Market seems to be preferred where it has been tried. Yield capacities of these varieties in commercial plantings have been excellent.

Onions:—Interest in onions is being revived as a result of availability of drying equipment which might be used in the curing of onions. Two varieties which have performed well under most Florida conditions are Early Grano and Excell.

Tomatoes:—This is probably the most important vegetable crop grown in Florida and is second only to bush beans in acreage. Rutgers, Stokesdale and Grothen's Globe are the varieties commonly grown with about 75 percent of the acreage in the lower half of the state planted to Grothen's Globe, both in the fall and spring. Markets show a marked preference for globe-shape fruit and object to roughness and large blossom scars. Several new varieties tested in recent years appear to be better than Grothen's Globe and Rutgers from the standpoint of yield and marketability but they do not seem to be entirely satisfactory and their general adoption to replace present standard varieties appears doubtful. Tomatoes are susceptible to numerous plant diseases, the most destructive of which are Fusarium wilt, mosaic, late blight and bacterial wilt. Fusarium wilt is prevalent in all areas of the State. It is especially destructive on sandy lands but is now becoming prevalent on the marl land on the lower East Coast. Most of the new tomato introductions are resistant to one or more of these diseases. As stated above, widespread trials indicate that the adaptation of these new varieties has been confined to rather limited areas. Commercial seed stocks are available of some of them.

The varieties Manahill and Manasota seem to do fairly well in the southern section of the State and along the Gulf Coast. Manahill has a tendency to produce rough fruit with large blossom-end scars under some conditions but it is of excellent quality and flavor. It is resistant to fusarium wilt, alternaria (early blight) and gray leaf spot. Manasota, considered best for fall growing, is quite susceptible to blossom-end rot and gray leaf-spot, but is resistant to Fusarium wilt and produces globe shaped fruit that average small in size. Both of these varieties consistently produce higher yields of marketable fruit than Rutgers and Grothen's Globe.

Jefferson, resistant to Fusarium wilt, has proven very satisfactory in some plantings on the Gulf Coast and at Gainesville. Reports from Gainesville indicate better than average yields of No. 1 fruits, resistance to cracking and about

the same maturity date as Rutgers. Experience with the variety in the Ruskin-Manatee section has been varied, indicating that it is sensitive to environmental factors of soil and cultural practices. Limited trial of this variety is recommended.

Wilt resistant Grothen's Globe, introduced in 1948, has been grown with varied results at Bradenton and Ruskin. It is somewhat later in maturity than regular Grothen's Globe. First cluster fruit have a tendency to be rough, but yields of No. 1 and marketable fruit have been superior to regular Grothen's.

Several other new unnamed varieties show considerable promise, but most of them possess more or less objectionable defects.

Perhaps the most promising of these varieties is one of the Southern Tomato Exchange Program (STEP) lines carrying the number STEP 89. This variety is of Rutgers type, with good skin texture and quality and ripens evenly at the shoulders. It is resistant to Fusarium wilt and has a vigorous vine. It has performed equally well as a ground tomato or staked and pruned. Reports from different sections of the State indicate that it is adapted to a rather wide range of conditions. Other numbered varieties that look promising are STEP 135, STEP 68, and Missouri S34. All of these have produced better yields than Rutgers or Grothen's Globe, but are not entirely satisfactory due to irregular shoulders, large blossom scars, uneven ripening or other defects. Continued selecting may eliminate these faults and one of these may become the ideal tomato we have been searching for.

Sweet Corn:—Interest in this crop has resulted in expanded acreage in nearly every section of the State. Since the advent of DDT and other new insecticides used for the control of ear worms, the acreage of sweet corn planted in the State has increased to more than 27,000 acres. The major share of the crop is planted to two varieties, Ioana and Golden Cross Bantam. Golden Security is gaining in favor, while Calumet and Gold Rush are planted extensively in the Glades area. Erie and Calumet are being recommended for the sandy lands around Sanford. Illinois Golden No. 10 produced well in most areas. All things considered hybrid sweet corn has been a successful crop wherever it has been tried but new growing and handling problems complicate the production of the crop. As the acreage expands and large areas are given over to corn, insect control becomes more difficult and diseases become more prevalent and destructive. During the season just past, corn ear worms and army worms were so numerous that it was almost impossible to control them with methods which had been successful heretofore. Helminthosporium leaf blight has become so prevalent that it was directly responsible for the total loss of some plantings attacked in the early stages of growth. Increased production and ample supply throughout most of the season reduced competition for the crop and buyers became quality conscious. Wormy and otherwise poor corn became a drug on the market and heavy losses were sustained by many growers.

As acreage increases and the consumer becomes accustomed to fresh sweet corn out of season growers are going to find it necessary to plant varieties having better quality than the present varieties. There are a number of these available at the present time, and new ones will be found that will be superior.

As stated above, there are numerous varieties suitable for growing in all sections of Florida. Generally speaking, the varieties that produce well in the spring can be depended upon to produce good corn in the fall under reasonable weather conditions. New varieties recommended for trial include Erie, Aristo-

gold Bantam Evergreen, Parade, Huron, Flagship, KVF 45-10, Double Duty. For white hybrids, try Silverliner or Truckers Hybrid. For large ears, Golden Grain is recommended.

Celery:—A new variety being recommended for trial in the celery growing sections is Emerson Pascal. Recently released and tested, it has high resistance to celery blight.

Potatoes:—Kennebec, a promising new white-skinned variety, has yielded about the same as the standard Sebago in tests at Hastings during the last four years. Its tubers are similar to those of Sebago in color, size and shape and earliness. It is moderately resistant to cracking; its resistance to brown rot is unknown. Kennebec is highly resistant to late blight. It is recommended for trial by growers. Dakota Chief is recommended for the Sanford area.

Cantaloupe:—Acreage of this crop is on the increase in the State. With the introduction of new fungicides capable of controlling downy mildew, the most destructive disease, and insecticides that are almost specific against the pickle worm and aphids, a number of varieties have been grown successfully commercially along the Gulf Coast.

There are commercial varieties that fill the needs of most demands for fruit size and quality. Of these the following are recommended: Powdery Mildew Resistant No. 45 and No. 5 produce medium size, well netted fruit; Hales Best and Hales Jumbo, medium and large fruit also well netted; Burrell Jumbo (a strain of Hales) and Smiths Perfect, a downy mildew resistant variety of delicious quality for local consumption. It will not stand shipping and rough handling. Two large muskmelons, Seneca Bender and Schoons Hardshell are recommended for trial. The latter is very resistant to worms; both have excellent quality.

Several new varieties almost immune to downy mildew were grown at the Vegetable Crops Laboratory last spring. These originated in Texas and Georgia and showed much promise. They produce heavily netted, medium sized fruit and have quality equal to Smith's Perfect. When seed of one or more of these varieties become available, it is possible that acreage of this crop will expand rapidly.

EFFECT OF LOW NITRATE NITROGEN ON GROWTH OF POTATOES

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A type of leaf roll occurring on Irish potatoes growing on acid flatwoods soils was brought to attention in March of 1949. Leaf margins were rolled upward and in toward the midrib. Stems and the under surfaces of leaves sometimes had a purple tint, but there was no leaf pattern of yellow or faded areas so commonly associated with a deficiency of some element. The trouble appeared mainly on Leon and similar soils of the Federal Point and Bimini areas. Later it was also found in the LaCrosse area.

The first symptoms appeared soon after the first thin leaves were formed, but usually became the most pronounced about blossom time. The leaf roll was permanent once it had taken place. It was also noted in subsequent examination of plants showing the symptom that tubers were set so close to the stem that movement of them