the war. The next rise coincides with the introduction of frozen orange concentrate. Note the falling off last season due to high prices and heavy losses by the Concentrators the year before. This same thing might be expected this season, due to high inventory and low prices this summer to move the accumulated inventories. These peaks and valleys are dangerous to every segment of the industry and should be avoided if possible.

It has been pointed out by the Industrial Survey Co., that the per capita consumption of citrus is 103 pieces of fruit per year or 2 fruit per week per person. It would seem easy to increase this 50% or 3 fruit per week. It is not an impossible task but it has taken us a long time to come this far. We should not miss an opportunity to increase the sale of our fruit whether it be by advertising, promotion, beverages, dispensing machines or some new miracle product such as frozen orange concentrate. We can not sit complacently by with our large new acreages coming along. As the charts all show, we are the leaders of the citrus industry now, and as such we have a very definite responsibility of leadership.

**VARIETIES OF VEGETABLES SUITABLE FOR FREEZING**

**GRAY SINGLETON**

*Director, Research and Control Division*

*Southland Frozen Foods, Inc.*

*Plant City*

When the freezing of vegetables was started some years ago very little was known about the freezing characteristics of the different varieties. The enormous consumer acceptance of frozen vegetables encouraged a large number of concerns to get into production and many of these new processors had little or no technical information about food freezing and did not realize their need for adequate laboratory facilities.

Production in this new industry was more...
rapid than the existing cabinet space in retail stores warranted and a situation soon developed where there was a larger volume of frozen vegetables than could be offered for sale through available outlets.

When competition developed for cabinet space in the retail stores it was soon evident that some brands moved faster than others. It was also noted that the merchant, whose cabinet space was limited, did not want this space occupied by slow moving brands. The Housewife had decided that she liked certain brands better than others. It was no accident that the fast moving brands were processed by firms which had the best research laboratories. The food technologists in these laboratories had determined the factors which affected consumer acceptance and one of the most important findings was the fact that certain varieties of vegetables had better color, texture and flavor, after freezing than others.

The situation became so acute in 1947 that most of the firms which did not have research facilities were forced out of business, as those who had the best products took over the available space in the frozen food cabinets. Too many processors had assumed that a variety which was good for the fresh market was also good for freezing. This is not always true. For instance, Black Valentine is a good bean for the fresh market but it has too much fiber for freezing. DiCicco is a good broccoli for fresh market but, after freezing, the color is too light. Early Green sprouting Calabrese is a much better color and is the standard variety of broccoli for freezing. Some of our best fresh market beans have poor texture or slough the outer skin when frozen.

Southland Frozen Foods, Inc., realized early in the deal that the brand with the best quality would survive and that those with inferior products would be financial casualties. Accordingly, a program of research was undertaken to determine, among other things, the best varieties of vegetables for freezing.

At the start of this work Southland realized that, from practical considerations, we must consider the income to the farmer in all phases of our work. We cannot operate without raw material. The farmer will not produce raw material for us without profit. If there is a high-yielding variety available he will not plant a low-yielding variety just because we want it for freezing. The Tendersgreen bean is a good example of this. Tendersgreen is a good bean for freezing. It is firm, full fleshed and is on the approved list of all the major distributors. The color, after blanching, is not as uniform as we would like and the snipper loss is high in those areas infected with mosaic but it was considered a good bean for fresh market, canning and freezing until the seed breeding laboratories introduced varieties which were very resistant to mosaic, mildew and wilt and produced enormous crops. The farmer who had been getting 100 to 150 bushels of Tendersgreens, per acre, lost interest in them when he saw Top Crop yielding 300 and more.

But these high-yielding new varieties would not make a fancy grade of frozen beans. The Government grading rules for frozen beans specify that beans, to be graded as fancy, must be "Full fleshed." The new varieties were not full fleshed. They had cavities around the seed which threw them into B grade. Most of these new varieties sloughed the outer skin on thawing and, because they were not full fleshed, they became soft and flabby on thawing instead of being firm and solid as a fancy bean should be. They did not make an attractive dish when cooked.

Several years ago we saw this change coming and appealed for help. We asked the U.S. Regional Seed Breeding Laboratory, at Charleston, S. C., the State experiment stations and the major seed producers to help us find a bean which was a high yielder, was resistant to disease and had high quality when frozen.

Dr. W. J. Zaumeyer, at the Beltsville Station and Dr. B. L. Wade, at Charleston, went to work on the problem. Dr. Wade died before the job was finished but Dr. James C. Hoffman, formerly at Belle Glade, took his place and carried on. They produced a greatly improved variety which has been named Wade's Bush in honor of Dr. Wade. This is not a perfect bean for freezing. The texture, after freezing, is not as firm as Tendersgreen but it has more uniform color and less snipper loss. It will make a fancy product when frozen. It has the advantage of exceptional disease resistance and gives enormous yields. The seed will be available for planting next spring.

Associated Seed Growers, Inc., developed a new variety of bean called Tenderlong 15. This seems to be an all-purpose bean. Judging
by our experience, both in Florida and New York State, Tenderlong 15 comes nearer to our ideas of what the perfect bean should be than any other variety that we have tried. In our tests it has not given as high yields as Wade's Bush and Top Crop but the yields have been far above the Tendergreen. It seems to be quite resistant to most bean diseases. It has the best color, after blanching, that we have seen. It has excellent texture after freezing, is full fleshed and does not slough the skin on thawing.

Wade's Bush and Tenderlong 15 are particularly important to Florida growers in view of the rate at which cattle are pushing beans out of the Lake Okeechobee area. These are the only two varieties which, in our tests, have given both high quality and good yield on both muck and sand lands. Beans cannot compete with beef for net profit, per acre and, if the present trend continues, it will be only a short time until we are forced to depend on sand lands for our beans.

More space, in this paper, has been given to beans than to other vegetables on account of the critical situation around the Lake. We must face the fact that beans are being forced out of the Lake area and we must develop varieties which are suited to sand land production where mosaic, mildew and wilt are serious problems.

STRAWBERRIES

Strawberries, although regarded more as fruit than vegetables, should be mentioned here because of their importance as frozen foods. Unfortunately, most of the standard varieties are not suited to Florida conditions. For many years we have had only the Missionary. It is far from perfect but it was the best that we had. It is a low yielder, has poor color inside and is too soft for freezing. For many years Dr. A. N. Brooks, at the Strawberry Laboratory, near Plant City, has been breeding for better varieties and it looks like his work is about to pay off. He has several varieties which are showing remarkable improvement over Missionary. The following is a brief description of some of these new varieties:

No. 31 and No. 33 will be considered together since they are very similar. Both have very high plant vigor. They produce very large plants and heavy crops. The texture of the fruit is firm and they freeze well but they are light colored, both externally and internally.

No. 45. This is the highest yielding strawberry of which we have any record. It is well colored, inside and out. It has good flavor but is rather rough in appearance. It puts most of its bloom and berries outside the foliage where they are exposed to frost.


No. 90. This seems to be the best berry of the new varieties. It has good plant vigor, excellent color, inside and out. It sets bloom under foliage where bloom and fruit are protected from frost and the fruit is held off the ground. It bears very large crops of well-shaped, large berries which are well suited to freezing for both ice cream and retail pack. The flavor is excellent and this will probably be our Florida berry of the future.

No. 120. Very high plant vigor and high yield. Good flavor and color but rather too soft for shipping. A good freezing berry for ice cream but too soft for slicing. Early season berries tend to be elongated.

TURNIP GREENS

Shogoin. (Japanese Foliage) Gives a high yield of smooth foliage which is held well up out of dirt. This facilitates washing. Has very fine color, flavor and texture. Is very resistant to insects, particularly aphids. Very hardy to both heat and cold. Can be produced for freezing in about ten months out of the year. This variety is liked so well by our customers that we do not freeze any other.

MUSTARD

FLORIDA BROAD LEAF. Very high yield with fine color and flavor. Smooth foliage held well up out of dirt makes it easy to harvest and wash. Makes an attractive pack. Well liked by the trade.

COLLARDS


FLORIDA SAVOY. Seems to give a little better yield than Vates. Curled savoy leaf makes a very attractive pack. Cooks in less than half the time of Vates and Georgia. Seed
bed should be well irrigated as this variety is easily killed by dry weather.

GEORGIA. This variety is very hardy and is the one used most. It stands drouth well and its worst fault is its very long cooking time. Cooking time is important in frozen foods. Women expect all frozen foods to cook quickly, even collards.

OKRA

PERKINS LONG GREEN And CLEMSON SPINELESS are standard varieties for retail pack on account of good color. EMERALD and LOUISIANA GREEN VELVET are good for cut okra used in the packing of canned soups where light color is not a defect. These varieties are high yielders but bring a lower price to the farmer because their color is too light for the retail pack.

SQUASH

YELLOW CROOK NECK. This is the only variety now used in Florida for freezing. When sliced and blanched the inner part of the slice changes from white to green. These green slices with their golden borders makes a most attractive appearance in the pack and on the table.

CAULIFLOWER

SNOW BALL. This is the only variety now used in Florida. Like okra, it turns brown when underblanched. It also floats in the blancher and cooling water unless completely blanched. The color does not change as quickly as does underblanched okra. It shows a light yellow coloring on cooling, which changes to dark yellow in two days and dark brown in three months. Complete blanching is very important in frozen cauliflower.

SOUTHERN PEAS

This vegetable is in a state of flux at the present time. The blame for this state of affairs can be charged to Dr. W. H. Brittingham, of the Texas Agricultural Experiment Station and to Dr. Charles L. Isbell, of the Alabama Agricultural Experiment Station. As soon as we think that we have found the best pea they come out with something better.

For a long time CALIFORNIA No. 5 was the standard variety. This is a low yielder and does not fill the pods well. We buy peas by the ton, in the pod, and we do not like to pay for a lot of pod and only a few peas.

We have been testing different varieties of Southern Peas for several years and are of the opinion that some of the new varieties, not yet released, will be better than anything that we now have. Texas Extra Early looks like one of the best now available. It has shown strong wilt resistance under Florida conditions. This is important. It has high yield, early maturity and good quality.

Some of the Texas Creams, which look and taste like Conchs, have better appearance and eating quality than the blackeyed varieties. However, the trade does not know of the good qualities of the creams and continues to call for blackeyed peas. Another processor put up a pack of creams this year and we are waiting to see how he comes out.

One of the best yielding blackeyes in our tests is ALABUNCH. However, in two years test planting at Plant City this variety has shown considerable damage from rhizoctonia. Dr. Isbell has some new varieties which we are testing for the first time this year. They seem to be completely resistant to wilt and have more plant vigor than Alabunch. One of these may be the pea that we are looking for.

The matter of better varieties has become increasingly acute this year. There is a new phase developing in the battle for cabinet space in the retail store. Frozen citrus concentrates have crowded out some of the weaker brands and then the 19c brands came into the picture. These are B grade packs which are put up to sell at a low price. There is plenty of room for both fancy and B grade canned goods on the shelves but there is no room for any more brands in the freezer cabinets. Someone is going to suffer. It will probably be the fancy pack which is not enough better than the B grade so that the buyer will notice the difference. The high grade, premium packs, which the housewife has known for years, will hold their place in the cabinets because she knows that they are top grade and she can see the difference between these and the B grade packs. She will buy the top grades and her sisters will buy the B grades at bargain prices. The low fancy packs, made from varieties which are not the best, will probably have very hard sledding.