

From present indications Idaho will be practically free of bovine tuberculosis within a short time and will be the first of the Northwestern States to attain this goal. The livestock industry of the State recognizes that success in the production of animal products depends on healthy animals of high quality.

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CELERY Leaf Tier Has Become Serious Pest in Parts of Florida

The celery leaf tier, *Phlyctaenia rubigalis* Hbn., a widely distributed native insect, has long been recognized as a pest of many greenhouse plants, but only in comparatively recent years has it attracted attention as a pest of the winter-grown celery crop of Florida. About eight years ago the celery growers in the Sanford district suffered severe losses from the depredations of this insect, and since that time it has been necessary to wage an intensive campaign against the pest. While the degree of infestation has varied from year to year, the presence of the insect has caused considerable concern to the celery industry.

The damage to the celery crop by the celery leaf tier is due to the feeding of the larvae or worms on the leaves and stalks of the plant. During the early development of the insect most of the feeding is done on the undersides of the leaves, but when approaching maturity the worms may devour the whole leaf. When about one-third grown they begin to knit or tie one or more leaves together. They prefer the most succulent parts of the plant and do a considerable amount of the feeding on the central leaves, thus causing ragged, unsightly stalks bearing considerable frass. Stripping to remove the worm-injured leaves is often necessary in order to obtain marketable plants, and many otherwise marketable stalks are discarded during harvest.

The adult of the celery leaf tier is a small brown moth, the female of which deposits its small, almost transparent eggs on the undersides of the leaves of the plant. The eggs may be deposited singly or in groups of 2 to 15 and slightly overlapping one another, having an arrangement and appearance in the larger groups similar to that of a number of fish scales. When the worm first emerges from the egg it is almost colorless except for a black head. As the larva matures it becomes light green and develops a pair of longitudinal white stripes on the back. The mature worm is about three-quarters of an inch long. The resting or pupal stage of the insect occurs within the folded leaves of the celery plant. It is from this stage that the moth appears.

The Leaf Tier's Life Cycle

Under exceptionally favorable conditions for the development of the insect its life cycle may be completed in about 25 days. During the cooler months it may require a period of nearly three months from egg to adult. During the spring and late fall a generation of the worms will develop in a little over a month. The celery leaf tier usually disappears in late May or early June and does not appear again in the Sanford district until early in October, when fresh moths make their appearance in the earliest planted seed beds. Their appearance usually follows the first sudden drop in temperature after the mean tem-

perature of the season has fallen to 77° F. or below. Sudden drops in temperature at this time of the year almost always follow rainstorms, so the celery leaf tier may be expected to appear when the mean temperature has fallen to 77° or below and is followed by rain. In an exceptionally hot and dry fall the moths may not appear until November and in an equally hot spring they may disappear early in May. It appears, therefore, that the most favorable conditions for the development of the insect are those which are favorable for the best growth of the celery plant.

There are normally four generations annually of the celery leaf tier in the Sanford district. When conditions are unusually favorable there may be an increase in the rapidity of development with an additional generation as the result. During the harvest of the crop, which extends from February to the middle of May, there is naturally a gradual concentration of the moths in the unharvested fields. If the development of the leaf tier is sufficiently rapid at this time to produce a generation of from one-half to full-grown worms in these fields before they in turn are harvested, economic damage results. Under average weather conditions at Sanford, the celery leaf tier is not expected to be an economic factor in the production of celery, but during periods of unusually high temperature during the winter and early spring months injury is serious.

In addition to the effect of temperature, there are other natural factors which are responsible for the limitation of the pest, such as parasites and migratory birds. The most effective parasite is an egg parasite (*Trichogramma minutum* Riley) which is active during the summer, fall, and spring. Its most valuable contribution to the control of the leaf tier is made during the first generation in the fall and again during the spring when the population of moths is at its peak. There is a succession of birds in the celery fields and they account for a large number of larvae and moths. This is especially true of the migratory birds which pass through in the spring of the year. There are cases where birds are plentiful enough to keep the celery tier entirely under control in a normal year in the isolated fields, especially those adjoining woodlands.

Control Measures Often Necessary

In addition to the natural factors which function to keep the celery leaf tier under control, it is often necessary to resort to artificial measures in order to prevent severe damage to the crop. Much can be accomplished by a systematic scheme of planting and harvesting with the object of avoiding the usual concentrations of moths in the later harvested fields. Many growers now recognize this possibility and plan their plantings so that the crop can be harvested in such a way that there will be intervening harvested fields between the celery being harvested and that to be cut later. If the season has been warm and the pest has developed in large enough numbers to cause economic loss to the late celery, it is necessary to employ some means of reducing the infestations. Arsenical poisons are not recommended because of the possibility of excessive residues on the marketable product and the difficulty of reaching the worms with these poisons. Dusting with finely ground pyrethrum dust of a good quality has given excellent results, when this dust is applied in such a way that it is distributed in the central parts of the plants. In order to obtain a satisfactory distribution of the dust it is necessary to place the nozzles of the duster so

that they will pass through the plants and deposit the dust on the innermost leaves. The treatments should be directed at the immature worms, as they are more susceptible to the action of the pyrethrum than the mature ones. Treatment for the celery leaf tier should consist of two applications about 30 minutes apart, each requiring 25 pounds of the dust per acre. The dust is usually employed without dilution, but equally good results may be obtained with equal parts of pyrethrum and lime, provided the mixture is made just before the dusting is done.

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CHAYOTE, Tropic Cucurbit, Increasing interest in the growing
Finds Wider Market as of chayotes for home use and for
It Becomes Better Known local markets has been noted during
the last few years in the lower
South, especially Florida. Stimulated by the efforts of home demonstration workers, housewives are finding this cucurbit native of Central America, which has adapted itself to our Gulf coast and southern California, a welcome addition to the table. Food caterers in general, too, are becoming better acquainted with this little-known vegetable that comes on the market at a season when the usual variety is somewhat reduced.

The marketing of the increasing crops of chayotes has not been unattended with difficulties for the producer. Their efforts, though, are being rewarded, for chayotes now are appearing in season in northern as well as in southern markets. A growing acquaintance among consumers has brightened the market outlook for the crop, and the chayote is now winning for itself a place that is likely to be permanent in the public esteem.

The chayote (pronounced *chī-ō'tī*—*ch* as in *chime*) is usually a late autumn crop, though sometimes a late spring crop also is produced. It is unique in form and structure, and, what is much to the point in a food product, it is attractive in appearance as well as pleasing in texture and of delicate flavor. Botanically the chayote is related to the squashes and the cucumber, but from the mature fruit alone one would not suspect the relationship. The "fruit" is more or less pear shaped and is somewhat flattened laterally. The vegetable has long been grown in a small way in a number of localities in the South and in southern California, where it has been known under different names, such as mirliton, vegetable pear, and mango squash.

Has Varied Table Uses

The adaptability of the chayote as a table vegetable is one of its outstanding characteristics. It lends itself to a wider range of methods of preparation than most of the more familiar vegetables. Chayotes usually are more easily pared after slicing, crosswise or lengthwise. The single large seed is usually cooked and eaten with the rest of the vegetable. In slices or cut into dice, the vegetable is cooked in not exceeding 15 or 20 minutes. It is best boiled in just enough salted water to cook it. A little sugar is sometimes added. Two popular