

number of different bacteria and fungi could produce the typical hard dark centers in tomatoes.

The disease seems to be sporadic. It occurs in hot moist weather following a time when growth has been retarded from cold or drought. The organisms probably enter at the stem end, where the cuticle ends and the stem begins, and work inward. They may gain an entrance at any stage of the developing green fruit.

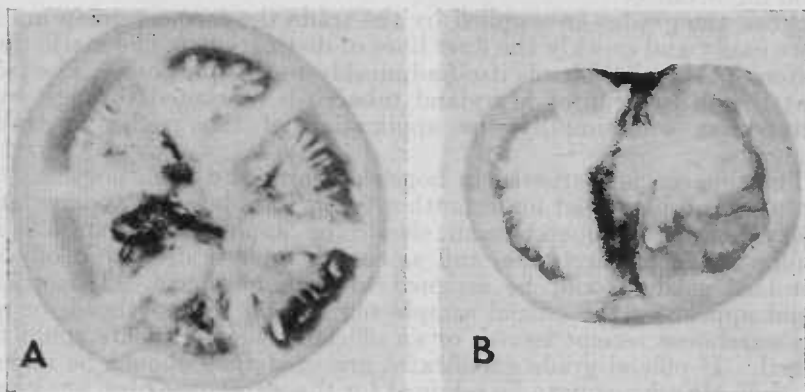


FIG. 239.—The hard dark center rot of tomatoes showing in green fruit

The best preventive measure is to keep the plants well cultivated, so there will be a steady even growth. Then no sudden rapid swelling of fruit is apt to occur. It is this rapid swelling which gives rise to tiny fissures around the stem end, making entrance places for bacteria and fungi.

NELLIE A. BROWN.

TOMATOES Resistant to Nailhead Rust Now Widely Planted

Nailhead rust of the tomato is characterized by brown to olive-gray spots, about the size and shape of an average-sized nailhead, on stems, leaves, and fruits. (Fig. 240.) Death of the leaves and scabby blotches on the fruits accompany these symptoms when the spots become numerous. The disfigurement of the fruits makes them unsalable.

Nailhead rust is caused by a fungus—a very minute, threadlike plant similar to the molds that grow on bread, pie, cake, meat, leather, etc. It is too small to be seen without the aid of a lens or microscope except when growing in mass, as on the surface of nailhead spots or culture media.

The nailhead rust fungus forms numerous small reproductive bodies called spores. These spores (the equivalent of seeds) germinate under favorable conditions of temperature and moisture and produce the branched threads or filaments of the fungus.

The filaments grow either on dead plant materials (chiefly remains of previous crops) lying on the surface of the soil or in living tomato plants. They penetrate the plants either by means of enzymes, which decompose the tissues at the point of contact, or by growing through small pores in the surface layer. When inside the plant

they attack and kill the immediately surrounding tissues. These dead areas constitute the spots or symptoms of the disease.

Nailhead rust is very common in the Gulf States, in South Carolina, and in the Sinaloa district of Mexico. It occurs sparingly in the region bordering the States mentioned and is found occasionally farther north, but usually causes little damage in the latter area. It has often been carried into the canning States of the North on southern-grown tomato plants, but has apparently been unable to establish itself in these States.



FIG. 240.—Nailhead rust of tomato

Economic Importance of Nailhead Rust

Nailhead rust has caused an average loss of about 25 per cent of the crop, amounting to \$2,500,000 to \$3,000,000 annually in Florida for at least one or two decades. It has also caused considerable loss in Texas, Louisiana, Mississippi, and South Carolina. It has also been very severe in Mexico. In fact, the tomato industry of both Florida and Mexico has been seriously threatened by this disease.

Several methods of nailhead-rust control have been tried repeatedly by experimenters and growers. Spraying or dusting the plants with fungicides gave some promise, but growers were unwilling to adopt it because of the cost of chemicals and labor and the uncertainty of results. Investigations now being conducted by the Florida Agricultural Experiment Station, however, may ultimately lead to a more efficient method of spray control for this disease.

The use of a resistant variety is the ideal method for the control of nailhead rust, as it requires no additional expense or labor except for picking and handling the extra fruit. The new Marglobe variety (fig. 241), developed at the Arlington Experiment Farm, near Washington, D. C., was produced for this very purpose and has given excellent results in southeastern Florida in three years' tests conducted by the Bureau of Plant Industry and the Florida Agricultural Experiment Station, in cooperation with the Dade County Commissioners

and commercial growers. It has also given similar results in large commercial plantings in Florida and other Gulf States and in Mexico. In fact, it has apparently solved the most difficult phases of the nailhead-rust problem. A brief description of its origin and suitability for shipping is pertinent.

Origin of the Marglobe

The Marglobe was developed from a cross between Marvel and Globe. In a two years' test of more than 100 varieties for nailhead-rust resistance, Marvel and Globe seemed to offer the best possibilities for the development of a resistant variety of the desired type.

Marvel was chosen as one of the parents because of its free and continuous fruit-setting habit, long bearing period, high degree of resistance to *Fusarium* wilt and nailhead rust, and partial resistance



FIG. 241.—A typical Marglobe plant, showing type of fruit and fruiting habit. Only part of the plant is shown, and the foliage is pressed down to show fruits

to *Septoria* leaf spot, early blight, and leaf mold. Although its fruits are smooth, uniformly red, and well flavored, they are a little small, somewhat flat, rather late in maturity, and less meaty than desirable for a shipping tomato.

Globe was selected as the other parent because it produces large, thick-walled, globular fruits and possesses considerable resistance to most foliage diseases, although very susceptible to nailhead rust of fruits.

The Marglobe is rapidly supplanting the Globe in Florida and other trucking regions. It is much superior to the Globe in resistance to nailhead rust, *Fusarium* wilt, and puffiness of fruits—diseases common and destructive in the Gulf States.

The Marglobe is an early and continuous bearer; in fact, it not uncommonly makes from 8 to 12 pickings during the winter in Florida, and on the heavy, fertile soils of the North it usually con-

tinues to bear until killed by frost. Although its fruits mature quickly, they ripen slowly and therefore withstand delays in picking and prolonged periods of shipping and storing. This is important during bad weather or temporary periods of heavy shipments and low prices.

The fruits of Marglobe are smooth, solid, globular, and comparatively free from undesirable types. They are packed chiefly in the 120 and 144 grades, the most desirable sizes for shipping in Florida. If picked when mature green, they ripen well, even around the stem, and develop a very good flavor.

Approved By Shippers and Growers

The Marglobe has won the hearty approval of growers and shippers. At many shipping points in Florida buyers have frequently paid more for Marglobe fruits than for the same commercial grades of Globe.

Approximately 10,000 acres of Marglobe were grown in Dade County, Fla., in the winter of 1926-27. A considerable acreage was also grown in Mexico. Extensive plantings were also made in the other principal trucking regions and in most of the commercial canning regions of the United States. In these areas it has resisted diseases well, especially Fusarium wilt, Septoria leaf spot, early blight, leaf mold, and nailhead rust, and has produced heavy yields of excellent fruit; in fact, it has given highly satisfactory results. Its resistance to nailhead rust is therefore only one of its many desirable qualities.

Marglobe seed is now produced in large quantities by commercial seed growers, canners, and canners and packers' organizations, and is sold by nearly all the principal seedsmen.

FRED J. PRITCHARD.

TREE Giants in the Sequoia Groves are Menaced by Tourists Among the wonders of the world the enormous "Big Trees" or Sequoias of the Sierra Nevadas in California surely stand in the first rank. Several large groves have been included in national parks and are strictly protected by the Government.

When these groves were set aside and protected from commercial exploitation for the use and enjoyment of the public the means of approach were few and primitive. The groves lie in the heart of the Sierra Nevadas at elevations between 5,600 and 7,000 feet. The mountain roads then in existence attracted only a small number of tourists. The majority passed through, content with a short visit.

The advent of the automobile and of good roads has changed all this. To-day tourists pour into the groves by the hundreds and thousands, and with them has come a serious menace to the chief attraction of the groves, the Big Trees themselves.

The visiting public naturally singles out those trees which, on account of their enormous size and their hoary age, appeal most strongly to its imagination. People like to come up close to the trees and to touch them with their hands. There is a peculiar attraction in camping under the shade and protection of huge trees 2,000 or 3,000 years old.