

real estate increased in value more, relatively, than have the other groups. Land valued at less than \$10 per acre in 1910 frequently was land in a low stage of development. The addition of improvements and the fact that an increase of only a few dollars constituted a large percent increase when the base is less than \$10, probably mainly explain these large increases.

Excepting the extreme high- and low-value groups, there appears to be a tendency in certain areas, and with certain exceptions, for the groups that experienced the greatest relative increases from 1910 to 1920 to have fallen the most from 1920 to 1930.

In the East North Central States, for example, the \$125-to-\$200-per-acre farms increased more than most other groups, fell further on an average, and ended the 20-year period considerably lower relative to the 1910 value, than was the case with the other groups.

In the West North Central States the \$50-to-\$125-per-acre farms, as a rule, increased more, subsequently declined further, and ended the 20 years lower, relative to their value in 1910, than did most of the other groups. In the South Atlantic region the \$10-to-\$75-per-acre farms rose more rapidly in value. Over the 1910-to-1930 period, however, these groups showed a smaller increase in value than did the average of all counties in these States. A somewhat similar situation is indicated in the East South Central section, but does not appear so clearly in the West South Central. In the latter group particularly, the more valuable farm land appears to have experienced the least relative increase in value.

These generalizations refer to regions, and not to individual farms. The distinction is significant, for a change in the enumerated acreage within a region may alter the average for a region even though the value of individual farms undergoes no change.

The variations that have been cited serve to illustrate the fact that a change in average value per acre for the country as a whole merely represents the sum total of the currents and cross currents that affect the various localities making up the whole. Accordingly, a national or regional average may be reasonably interpreted only as a measure of net effect, in a certain sense, but not as an accurate reflection of situations in particular localities.

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PINK-BOLLWORM Outbreak Fought by Destroying Wild Cotton in Florida The wild cotton of Florida is a true *Gossypium*, the stalks, leaves, blooms, and bolls having all the general appearance of cultivated cotton. The bolls are very small, usually with three locks, the lint being very short and of no commercial value. It is very probably a native of this locality, and sometimes makes good-sized trees, some reaching a height and limb spread of 15 to 20 feet, with a diameter of 4 to 6 inches. Because of the tropical climate the plants fruit almost continuously.

The southern end of Florida is in general a very low-lying country, the highest points being only a few feet above sea level. Near the coast the land becomes imperceptibly lower, and offers very poor drainage, which condition results in numerous islands surrounded by shal-

low water, many parts of them being covered during high tide. In the main these islands (or keys, as they are called in Florida), as well as the mainland, are covered with an almost impenetrable growth of subtropical plants, so that in order to get through these jungles it is oftentimes necessary to cut one's way with a machete.

Wild cotton in its natural state has only been found on the keys and near the coast on the mainland. As a rule there is a heavy growth of mangroves along the edge of the keys and mainland, and cotton, if present, usually occurs in a strip between the mangroves and the hammocks, which are composed of a dense growth of various plants. Many of the keys seem to have been inhabited in past ages by Indians who are thought to have made the numerous oyster-shell mounds which occur. Cotton oftentimes grows on these shell mounds.

The pink bollworm was discovered in southern Florida in June 1932, the initial infestation being located in small plots of cultivated cotton totaling approximately 2 acres, at the United States Plant Introduction Gardens at Chapman Field, near Miami. It was soon found that the wild cotton was generally infested. This wild cotton was found to extend from Miami to Key West, being most abundant from a point some 70 miles below Miami to the southern end of Lower Matecumbe Key, a distance of 25 to 30 miles. All of the cotton in this strip was infested. A considerable amount of infested wild cotton was also found on the mainland, near Flamingo, on Cape Sable.

The eradication of the infestation at Chapman Field was a comparatively simple matter; however, the wild cotton presented a much more serious problem. Its general distribution and the degree of infestation had not been determined; consequently it was not known at that time whether or not it would be physically possible to eradicate all of it from the State. It was perfectly evident, however, that it would be practicable to destroy all of that growing along the highways and in other easily accessible places so as to eliminate any danger of tourists or other travelers distributing the insect to new localities. This work was immediately begun, and was soon completed to the extent that one could pass through the area without finding any wild cotton unless at special pains to look for it.

Distribution of Wild Cotton

The next step was to conduct a thorough survey to determine as accurately as possible the exact distribution of the wild cotton; also, the extent of infestation. In making part of this survey it was necessary to charter a cabin launch to reach long stretches of inaccessible coastlines and numerous keys where considerable open water had to be crossed. A portable boat outfit consisting of a 12-foot skiff with outboard motor and trailer was used to advantage in less exposed locations. On the east coast the only wild cotton found above Miami consisted of four small colonies near the town of Grant, in Brevard County. On the west coast it occurred rather generally on the mainland and adjacent keys from Cape Sable northward to St. Petersburg. Only one small colony was located above this point on a small key near Hudson, in Pasco County. In no case was wild cotton found growing any great distance from the coast. This left a distance of only 150 miles between wild cotton and the commercial plantings of northern Florida. Sufficient inspecting was done to determine the fact that a considerable part of this wild cotton along the west coast was

infested, the most northerly being on Terra Ceia Island, in Manatee County. On the east coast only one infestation was found above Miami, this being on dooryard cotton plants at Lake Worth, in Palm Beach County. The survey indicated that it would be possible and practicable to eradicate the wild cotton from southern Florida and adjacent keys.

There are in general two seasons in southern Florida. In the late spring, summer, and early fall comes the wet season, and in the winter and early spring occurs the dry season. During all parts of the wet season much of the land is covered with water, and the areas are seriously infested with mosquitoes, which makes work practically impossible. Because of this condition the eradication was not begun until the latter part of November 1932. The experience gathered while eradicating plants from the roadside in the early summer demonstrated that it was necessary to remove all of the roots; otherwise they would put out sprouts. It was therefore necessary to go over the area which had previously been cleaned to remove these sprout plants and also seedlings, which had come up in the meantime. By "seedling" plants is meant those up to the size of walking canes; plants any larger than this are considered mature. All of the wild cotton on the east coast was removed.

On the west coast it was evident that it would be impossible to go over the entire area before the rainy season set in; therefore the area from Naples northward was cleaned. This increased the distance between commercial plantings and the wild cotton by 150 miles, making a total separation of some 300 miles. All of the accessible cotton on Cape Sable was also removed, together with much of that in the more inaccessible locations.

During this eradication campaign some 625,000 mature, 816,000 seedling, and 19,000 sprout plants were destroyed. Many wild and domestic cotton plants are grown in yards as ornamentals, and these have also been destroyed. With only 1 or 2 exceptions the owners very readily agreed to have such plants destroyed after the danger had been explained to them. It is planned to resume this eradication campaign during the next dry season.

Experiments with Chemicals

In connection with the program some preliminary experiments were carried on to determine the feasibility of killing wild cotton with chemicals. Sodium arsenite solution seemed to give the best results. Where this solution was sprayed on the plants, however, they merely shed their leaves and began putting out new growth. In other cases the solution was poured around the base and roots of the plant, but they were not killed unless the base of the plant was bruised in some manner before the solution was applied. Further experiments are necessary in this connection before any definite conclusions can be reached.

A number of difficulties have been experienced in this work. On account of the locations in which wild cotton grows, it was often necessary to work many miles from a base of supplies. For example, in the Cape Sable clean-up all supplies, including drinking water, had to be hauled for a distance of over 40 miles, part of which was over very bad roads. Of course, boats had to be used to reach the keys, and even so, it was necessary for the men to wade considerable dis-

tances in many cases. There were also insects to contend with, especially mosquitoes, and occasionally poisonous plants. Rattlesnakes are very numerous in that part of the State, and almost every day during the clean-up one or more were killed. In spite of all these difficulties the work progressed especially well. There is still considerable wild cotton in the more isolated localities to be destroyed; however, the work done thus far indicates that it will be possible and practicable to eradicate wild cotton in southern Florida, and thereby eliminate the present pink-bollworm outbreak there and prevent the establishment of new infestations on the keys and along the coast.

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PLANT Breeders Make Progress in Developing Disease-Resistant Corn Quality in corn is evaluated generally in commercial channels by the application of the Federal grain standards. Corn meeting the requirements for grades No. 1 and No. 2, and sometimes No. 3, is considered high in quality. Corn grading No. 5, No. 6, and Sample is usually acknowledged to be low in quality.

The two most important single factors in determining numerical grade or commercial quality at the present time are moisture and total damage. During the 9-year period 1923-24 to 1931-32, according to data gathered by the Bureau of Agricultural Economics from supervised inspections of corn receipts at all inspection points in the United States—

approximately 33 percent of the market receipts of the average crop of corn had their grade determined as lower than grade No. 1 because of the factor "total damage" under the present official standards.⁸

The ear and kernel-rot diseases (fig. 78) are very largely responsible for the damaged corn referred to in the grade factor "total damage." These diseases are also known as the "dry rots" of corn. Most lots of market corn carry a considerable quantity of slightly diseased kernels that are not sufficiently rotted to be classed as damaged. When such lots of corn have a rather high moisture content, the amount of badly rotted and damaged corn increases rapidly in storage and transit. Other things being equal, lots of corn comparatively free from these dry-rot infections are likely to retain their grade and quality much better in storage and transit than lots of corn that carry a high percentage of such infections, even though the infections may not be sufficiently developed to cause the corn to be classed as damaged.

Completely rotted ears that are left in the field or thrown out at the dump have little or no value. They subtract from the yield and add to the cost of production. Ears from plants weakened by disease are very likely to be chaffy or light in weight. When corn harvesting is delayed on account of unfavorable weather, the amount of partly rotted and weather-damaged corn from down and broken stalks frequently increases to a point where the feeding value and keeping qualities are materially lowered. Thus, the corn-disease problem is directly concerned with both the quality of corn marketed and that used on the farm.

⁸ UNITED STATES DEPARTMENT OF AGRICULTURE, BUREAU OF AGRICULTURAL ECONOMICS. PROPOSED REVISED FEDERAL GRAIN STANDARDS, INCLUDING EXPLANATIONS. U.S. Dept. Agr. Misc. Pub. 173: 82. 1933.