CR-7628
0481

OSU Current Report

Cooperative Extension Service • Division of Agriculture • Oklahoma State University

OKLAHOMA PEANUT DISEASE LOSS ESTIMATES FOR 1980 1/

R. V. Sturgeon, Jr.
Extension Plant Pathologist

Peanut disease incidence will vary from year to year, depending on the weather and control measures practiced by growers. Income from peanuts continues to play an important role in supporting the farming operations of many Oklahoma growers. High temperatures, dry weather, various pathogens and pests severely reduced yields. Many grower's income was reduced to the point of bankruptcy. During this dry season, foliar diseases were not very important, yet, soil-borne diseases continue to reduce plant vigor in some fields resulting in lower yields. Disease control practices continue to be important even during dry years. Although disease loss was low the bonus price received for those peanuts produced made that loss highly significant.

Each year diseases cost the Oklahoma peanut growers thousands of dollars and the 1980 season was not an exception. Soil-borne diseases caused the greatest loss. Pod rot, Southern blight, Sclerotinia blight, Verticillium wilt and Nematodes contributed heavily to the 1980 losses, [illegible]g up approximately 95% of the near 20% estimated [illegible] Oklahoma peanut production was critically reduced b[illegible]e drought. Many dryland fields and those that ran out of irrigation water were cut for hay, with only 105,000 acres of the 123,000 planted acres, harvested. These harvested acres produced 141,750,000 lbs averaging only 1350 lbs per acre. This compares to an average yield in 1979 of 2200 lbs per acre and 1800 lbs per acre in 1978.

Seedling diseases continue to be important, costing the Oklahoma grower approximately $3,462,660 in 1980. Seedling disease is a problem each year, however, it can be reduced with high quality seed, fungicide seed treatment and applying a soil fungicide in the furrow and covering soil at planting time. Researchers have shown that the combination of a fungicide seed treatment and a soil fungicide applied at planting in the furrow and incorporated in the covering soil are needed to insure healthy peanut seedlings. The seedling disease infections show a direct relation to severity of pod rot. Seedling disease is generally caused by a combination of soil organisms, thus it is called a seedling disease complex. The fungal pathogens most commonly involved in the "Seedling Disease Complex" are Rhizoctonia solani, Fusarium spp., Pythium spp., and Aspergillus niger. Fusarium spp., Rhizoctonia spp. and Pythium spp. are identified with the Pod rot disease complex and Aspergillus with crown rot. Young peanut seedlings have little or no natural resistance to the many soil-borne pathogens, hence fungicide protection is needed.

1/ Acknowledgements: The author wishes to thank the [illegible] Extension Directors, Area Extension personnel, U[illegible]versity personnel, Chemical Company Representatives, and Peanut Growers that contributed to obtaining the peanut disease loss data. Acreage and production data furnished by Oklahoma Crop and Livestock Reporting Service.

Southern blight caused by Sclerotium rolfsii was not severe over the State this year, yet certain fields were heavily damaged. In some fields the white thread-like fungal growth commonly found on top of the ground was not obvious but the fungus could be found underground growing from plant to plant causing extensive damage to the pods and nuts. Much of the calculated 438,311 dollar loss could have been avoided with proper use of Terraclor and/or Vitavax soil fungicides.

Aspergillus crown or Collar rot caused by Aspergillus niger can be found almost every year, however, in past years the number of plants killed by the fungus have not been great enough to be considered important. The radiation effect of the suns rays off sandy soil and high soil temperatures can damage seedlings at the ground level providing an opening for infection of the ever present A. niger fungus. Gibson in 1953 showed that high soil and air temperatures can predispose the peanut plant to infection. A. niger crown rot was found in all peanut fields visited. Loss to Collar rot in 1980 was estimated at two tenths percent or a calculated $175,324. The disease has not been severe enough in recent years to warrant developing a control practice.

Aspergillus flavus a soil-borne fungus is known to infect peanuts in the ground, the windrow or in trucks or trailers at harvest and can develop under certain storage conditions. This soil-borne pathogen can infect peanuts from seedling stage to maturity and is capable of producing aflatoxins in peanut kernels before and after harvest. No practice can be recommended at this time that will completely eliminate the aflatoxin problem, however, certain cultural and soil disease control practices will reduce the chances of the disease occurring. A. flavus segregation 3 peanuts not only amount to heavy loss to the growers but the presence of aflatoxins is a concern of the entire peanut industry.

The Pod rot disease complex was not as severe in certain fields that had suffered heavy loss in past seasons, yet, there were a number of fields that suffered 25% loss this year. Pod rot disease continues to cause heavy losses in certain fields, but it was reduced or controlled in others. A number of growers reported severe infection for the first time. In many fields the Pod rot disease took its toll causing a 7.5% loss in the state costing Oklahoma growers approximately $6,574,670 this year. Certain cultural and chemical practices have been demonstrated to reduce the severity of Pod rot. However, because a satisfactory control has not yet been attained, we can expect heavy Pod rot disease losses to continue.

Verticillium wilt caused by Verticillium dahliae continues to increase in the Caddo County peanut area. However, the disease is no longer just a Caddo County grower problem since Verticillium infected plants were found in Southern and Eastern Oklahoma fields. We are concerned about the spread of this disease since

there are no practical methods of controlling Verticillium wilt at this time.

Early and late peanut leafspots (Cercospora arachidicola) and (Cercosporidium personatum) did not become a problem in most fields. Losses occurred in some fields because growers failed to recognize the importance of a late season disease and neglected the application of a fungicide late in the season. Late season infection caused some defoliation of the peanut plants in the low bottom areas of some fields. Increased Cercosporidium personatum (late leafspot) infections as early as July 20 were found and increased during August in certain fields. The leafspot diseases moved down the stems to the pegs causing 15 to 20% losses in certain fields. This late season disease development was estimated to have caused State growers 0.75% reduction in yield. The 0.75% loss credited to the two leafspot diseases was estimated to have cost the growers approximately $657,460. This estimate may have been low. The heavier losses can be attributed to the pegs being weakened by the late season fungal infection and nuts being left in the ground. The major portion of this loss could have been prevented with a good late season fungicide program. There are many excellent fungicides presently recommended and available. Web blotch (Ascochyta spp.) and Leptosphaerulina leaf scorch caused by (Leptosphaerulina crassiasca) diseases were difficult to find and not considered to be a problem this year.

Root-knot (Meloidogyne hapla), Root lesion (Pratylenchus brachyurus) and Ring (Criconemoides sp.) nematodes were found in damaging populations throughout the peanut producing areas. Root-knot and Root lesion nematodes are known to cause heavy losses. All three species seem to be involved in the Pod rot disease complex. Certain fields visited this summer reflected poor control of Root-knot nematodes from nematicides used, however, in most cases the poor control could be associated with improper application. The Root lesion populations did not reach damaging levels until late season, hence, many of the nematicide applications applied in July had little effect in control. The Ring nematode populations found in 1978 did not seem to develop this year. The Ring nematode is known to cause injury to the roots and pods, however, we lack information concerning what population level can be considered damaging and we have limited information on its control. Several nematicides are available which when properly applied will provide effective and economical control of the Root-knot, Root lesion and Ring nematodes. Control of these nematodes could have drastically reduced the calculated $3,068,181 loss incurred by Oklahoma peanut growers.

The estimated $16,743,500 loss due to diseases in peanuts during 1980 is economically important and should be the concern of every Oklahoma peanut grower. Much of this loss could have been prevented with early detection and proper disease control practices. We realize the total calculated 19.10% disease loss could not have been prevented, however, at least 8.0% of this loss could have been prevented with early detection and using recommended disease control practices. This 8.0% loss estimate was based on the percent of those diseases that have recommended disease control practices available and actual research and demonstration plot results to support this yield increase. The average yield per acre could have been increased approximately 150 lbs per acre with proper disease control. Growers should contact their local County Extension Office for the recommended peanut disease control practices.

OKLAHOMA PEANUT DISEASE LOSS ESTIMATES FOR 1980 1/

DISEASE	% LOSS	LBS LOSS	DOLLAR LOSS
Seedling (18% Stand reduction)	3.95	6,925,324	$3,462,662
Crown Rot (Aspergillus niger)	0.2	350,649	$ 175,324
Southern blight	0.5	876,623	$ 438,311
Sclerotinia blight	0.5	876,623	$ 438,311
Verticillium Wilt	2.0	3,506,493	$1,753,246
Pod & Root Rot (Fusarium, Rhizoctonia, Pythium)	7.5	13,149,350	$6,574,675
Seg 3 (Aspergillus flavus)	0.2	350,649	$ 175,324
Nematodes (Root knot, Lesion & Ring)	3.5	6,136,363	$3,068,181
Foliar Diseases (Early & Late leafspot and Web blotch)	0.75	1,314,935	$ 657,467
TOTAL	19.10	33,487,009	$16,743.504

1/ Percent disease loss estimate derived from field surveys, grower reports, research and demonstration plots, field observations and plant disease diagnostic laboratory.

Total acres harvested	105,000 acres
Total acres planted	123,000 acres
Total production	141,750,000 lbs
Estimated production with no disease	175,324,675 lbs
Estimated total crop value with disease	$70,875,000 @ $1000/ton
Estimated total crop value with no disease	$87,622,337 @ $1000/ton
Average yield with disease	1,350 lbs/acre
Average yield with no disease	1,650 lbs/acre