only traces to slight losses in the western third of the province. The total loss in flax yields from aster yellows was estimated to be 1 1/4 to 2 million bushels in Sask. In the first report to the P. D. S. (33:38) on flax yellows in Sask., it was referred to as a 'potentially serious disease'. The epidemic of 1957 has amply borne this out. The scarcity of the disease in 1956 suggests a low carry-over of virus inoculum in perennial weeds, and that the greater part of this year's inoculum was derived from swarms of viruliferous leafhoppers from further south.

There is some concern as to the extent yellows infection during the early stages of seed formation may affect the filling of the seed. The relatively large numbers of small undeveloped bolls and of papery sterile seeds suggest that the effect on seed filling by these late infections may be appreciable.

Blight (Alternaria linicola). Towards the end of the season a few fields showed a browning of the top third of many flax plants. Isolations made from the lower end of this stem zone usually yield Alternaria spp., including A. linicola. Effect on yield is considered of no significance this year, but the conditions provided inoculum which could infect the maturing seed.

Pasmo (Septoria linicola). Recorded as slight on a sample received from Saltcoats.

Selenophoma linicola. Collected in scattered 'traces' in the University plots at Saskatoon, on the dry pedicels and fine top branches where the pycnidia form. It is several years since it was last found.

Frost. Flax escaped damage from the frost of 22 May. Some late flax seed was damaged by fall frosts. Damaged seed was blackish green or dark blackish maroon. This seed was plump, but soft, when the frost occurred.

Chemical Injury. TCA herbicide was used as a spray to control wild millet or green foxtail (Setaria viridis (L.) Beauv.) w. and s. w. of Saskatoon. Several sprayed fields of flax showed severe tip and leaf yellowing and burning, but stem distortion was not as conspicuous as is often the case with 2,4-D.

Flax Diseases in Manitoba in 1957

W. E. Sackston and John W. Martens

The area sown to flax in Man. in 1957 was large, about 865,000 acres. Yield was disastrously low. Tentative estimates placed it at 5.2 bushels per acre, but provincial authorities believe it is closer to 4.0 bushels per acre.

Several factors were responsible for such low yields. The spring was late and wet, and seeding was delayed. There was serious flooding in some areas in s. Man. Drought affected yields adversely in the southwest. It was hot and dry in July, when the flax was in bloom and adverse weather conditions delayed harvesting in the fall.

Diseases also reduced flax yields. The most conspicuous and destructive disease in 1957 was aster yellows. Its severity was assessed by a survey of 60 flax fields at the end of July. Some indication of the relative importance of other diseases later in the season was obtained from inquiries.

Aster yellows (Callistephus virus 1). Only plants that showed typical flower or boll symptoms were considered to be infected with aster yellows. No distinction was made between infection of a few flowers or branches, and infection of the whole plant. As plants in many of the fields were stunted and failed to reach the flowering stage because of early infection by the virus, and were therefore not included in the infected class, the average figure for percentage infection was conservative. No field was seen free of the yellows disease. The following infection ratings were given: 11-1 to 5%, 27-6 to 15%, 14-16 to 25%, 5-26 to 35%, 3-45% /60 fields. The average infection rating for Man. was slightly over 15% and the yield loss due to aster yellows was estimated to be at least 15%. Observations indicate that plants infected fairly late, and showing relatively light symptoms, may produce less seed, and poorer quality seed, than healthy plants.

There was no definite pattern of distribution of heavy or light infection in various parts of the province. In areas with many fields of flax, late sown fields tended to be more heavily infected than earlier sown, and earlier maturing, fields. In areas with only isolated flax fields, infections seemed to be about as heavy in the earlier, more mature fields, as in the later, less mature stands. It is possible that the leafhopper vectors of the virus prefer the younger plants, but will feed on maturing flax in the absence of younger, succulent plants. Counts made in plots at Winnipeg and other locations showed no definite varietal differences in reaction to aster yellows infection.

Rust (Melampsora lini) was present in trace amounts, in 4 of the 60 fields examined, and affected about 10 to 15% of the leaf area in a fifth field. The practical disappearance of rust as a factor in flax production is directly attributable to the widespread use of resistant varieties.

Pasmo (Septoria linicola). Traces of pasmo infection were found in one field at the time of the survey. As it was still early in the season, stem lesions were scarce, but leaf infections were rated 2-5%, 1-10%, 1-15% /60 fields. Light stem infection was noted in a field examined in September. Heavy stem infections were seen in experimental plots at Morden, and were reported from fields in the Morden area late in the season.

Seedling Blight (Rhizoctonia solani, Pythium spp., Fusarium spp.). Seedling blight specimens were submitted, and the disease occurred in some experimental plots. Traces of seedling blight were found in three fields.

Wilt and Root Rot (Fusarium oxysporum f. lini) of adult plants was found in trace amounts in one field.

Heat Canker (physiologic) specimens were received from various districts during the hot weather in July. Traces of the disease were encountered in 4/60 fields surveyed.

Terminal Blight (physiologic). The terminal 1 to 2 inches of shoots were dead, brown, and bent over in a typical "shepherd's crook" on about 5% of the plants in 1 field, and about 25% in another field. The symptoms were not those of wilt or root rot. It is possible that the condition was induced by the excessive heat in July, which "cooked" tissues made succulent by the earlier excess of water.

Other Observations

ANTHRACNOSE (Colletotrichum linicola) infection was moderate on Wiera at St. Leon and Louiseville, Maskinonge area, Que. (D. Leblond).

WILT (Fusarium oxysporum f. lini) caused moderate damage at St. Leon, and Yamachiche, Que. (D. L.).

RUST (Melampsora lini). Only trace amounts were observed in 2/43 fields surveyed in s. Alta. (E. J. Hawn). Two fields s.-e. of Edmonton were both diseased: 1-tr. 1-sl. (W. P. Campbell).

BROWNING (Polyspora lini) occurred only in traces in 3/43 s. Alta. fields (E. J. H.).

SEEDLING BLIGHT (Rhizoctonia solani) affected 21/43 s. Alta. fields: 17-tr. 4-sl. (E. J. H.).

HEAT CANKER damaged 3/43 s. Alta. fields: 2-tr. 1-sl. (E. J. H.).

ASTER YELLOWS (Callistephus virus 1) occurred in trace amounts in 3/43 s. Alta. fields (E. J. H.). It was unusually widespread in Sask. (R. C. Russell). Slight damage was observed in Raja flax at C. E. Farm, Ottawa, Ont. (R. V. Clark).