RAPE DISEASES IN SASKATCHEWAN IN 1963

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The above-average rainfall during the 1963 growing season favored the growth of oil-rape and also its diseases. However, the increase in yields from the abundant moisture more than counterbalanced the increased losses from disease in comparison with average years. The estimated rape acreage in the province in 1963 was 232,000 with a yield of 260,000,000 pounds or 1121 pounds per acre. This is the highest yield on record for the province.

It is suspected that the late rains, especially in northern areas, caused an increase in seed-borne fungi over the average incidence. Consequently it would be advisable to make germination tests on rape seed intended for seeding. If germination is below 80% the application of a fungicidal seed dressing is recommended.

Mention should be made of the gradual increase in the acreage of commercial mustard grown in the province. There were 80,000 acres sown with an average yield of 960 pounds per acre. Mustard is susceptible to many of the diseases found on rape. To date only slight amounts of Alternaria, Albugo, Sclerotinia, Fusarium and bacterial diseases have been found on mustard but it is to be expected that as the acreage increases, especially in northern regions, the diseases on this crop will also increase. Such was the story with rape after its introduction.

Aster yellows virus. Traces could be found in most fields examined just before harvest. One field with as high as 5 per cent of the plants affected in some areas was found near Spalding. This is the highest incidence of AYV since the epidemic of 1957.

White rust and staghead (Albugo cruciferarum). The conspicuous stage of this disease and the only one observed by most farmers is the deformation or hypertrophy of the tips of the flower stalks as maturity approaches. To use the name "White rust" for this stage of the disease is confusing to growers and it has been found more convenient when talking with them to refer to the enlarged stem tips as the "staghead" disease. The combined name "white rust and staghead" is proposed for use of the disease on rape in Saskatchewan.

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The white rust and staghead disease is well established in the relatively moist rape-growing areas of the parkbelt. Its severity in a field depends largely on the crop sanitation and rotation practices of the individual grower. The moist conditions in 1963 accounted for its more general prevalence. Five fields were found with from 3 to 10 per cent infection in scattered areas (Valparaiso, Tisdale, Nipawin, Spalding, Meadow Lake). One field at Glaslyn showed a slight infection of the late, green, side branches and none on the more mature stems.

Black and grey spot (Alternaria brassicae and A. raphani). Stem lesioning was conspicuous in some northern fields. The disease extended further south than usual and was slight in some areas of the University plots at Saskatoon. The pods and stems in northern swathed fields showed more evidence of Alternaria lesioning and discoloration than those in standing fields. This increase in Alternaria on rape in the swath during moist weather is probably due mainly to the saprophytic A. tenuis, rather than to the parasitic species A. brassicae and A. raphani. Butler (Fungi and Disease in Plants, Calcutta, 1918, P. 303) has observed that in rape the seed matures normally in the stack, and the fungus (A. brassicae) ceases to grow after the plants are cut. He also states that in Europe losses in affected rape-seed may be avoided by early harvesting. It would seem that early swathing of heavily infected fields in the northern disticts in Saskatchewan would be beneficial, especially in decreasing the amount of seed-borne infestation by Alternaria spp. Plating out of 1963 rape-seed from Dorintosh, Meadow Lake, North Battleford, Nipawin, Carrot River and Melfort showed that all samples were carrying unusually high percentages of A. brassicae. A. raphani was less commonly isolated. There is some evidence that in drier years, for example, 1961, A. raphani is more common than A. brassicae. Fungicidal seed treatment of low-germinating 1963 rape-seed samples from northern districts should be beneficial. Alternatively, rape-seed of good germinatibility from drier prairie districts could be used for seeding purposes without fungicidal dressing.

Basal stem rot (Sclerotinia sclerotiorum). This disease occurs regularly in moist years in northern areas. Several fields with trace infections were recorded; two had 1-5 per cent and one 5-20 per cent. The occurrence of this disease on rape is probably higher than records indicate since large numbers of plants with symptoms of basal stem blight do not always show internal sclerotia. It is felt that the absence of sclerotia in the presence of suspected symptoms in a particular field may indicate late infection.

Black blight or ring spot (Mycosphaerella brassicicola). This disease has become so widespread that most fields in the north and north east show grey to bluish-grey stubble instead of a clean, pale tan colour after cutting. This difference between southern and northern rape fields is conspicuous. There is some indication that the effects of black blight on the

plants are not as severe as the extensive black discoloration of the stems and pods indicates. For instance, early harvested plots of Arlo (Polish type) were heavily discoloured, whereas plots of late-maturing Golden and Nugget (Argentine type), which were still quite green, showed slight amounts of the disease. This suggests that the disease develops rather late in the life of the plant; it probably does not suggest that the Polish type is more susceptible than the Argentine type because heavily diseased fields of Argentine are commonly observed. Timeliness of rainfall may be a contributing factor. This disease is more regular in appearance and intensity on the rape crop in the parkbelt than any other disease.

Blackleg (Phoma lingam). Two severe infections (up to 10%) were located this summer, one at Annaheim and one north of North Battleford. This indicates that blackleg is more prevalent than our surveys have hitherto indicated. The disease is being studied because of its serious potential. Phoma lingam, which is highly pathogenic on rape, was isolated by G.A. Petrie from penny-cress Thalspi arvense L. in a rape field at Saskatoon. This finding is of considerable interest not only because of the general prevalence of penny-cress, but because it is a winter annual it may prove to be more serious as an overwintering host than annual hosts such as the various mustard weeds.

Powdery mildew (Erysiphe polygoni). No powdery mildew was collected on rape during the surveys in northern areas. During early October, however, two late plots of rape at Saskatoon became heavily infected. In one of these fruit bodies thought to be cleistothecia were observed with the naked eye. Surprisingly, on microscopic examination they were found to be mature pycnidia of the mildew parasite Ampelomyces quisqualis Ces. (syn. Cicinnobolus cesatii de Bary). This hyperparasite has previously been reported on Podosphaera oxyacanthae in Manitoba and Saskatchewan and on Microsphaera in Manitoba (Bisby, G.R. The Fungi of Manitoba and Saskatchewan, 1938. p. 132). It has not previously been observed on the rape mildew in Saskatchewan. The Ampelomyces had almost completely suppressed the production of conidia by the Erysiphe. In the other rape plot, about one mile from the first, no Ampelomyces was detected and the Erysiphe was producing copious conidia. The Ampelomyces was readily obtained in pure culture where it fruited readily.

Root rot (Fusarium spp.). In experimental work on rape, conducted by a graduate student in the greenhouse, about two dozen pots of rape died because of a severe root and basal stem rot when the plants were coming into flower. The soil was the usual greenhouse mixture. The fungi most commonly isolated, and which proved to be moderately pathogenic on rape seedlings, were later identified by Dr. C. Noviello, Canada Agriculture Research Station, Saskatoon, as Fusarium acuminatum, F. solani and F. equiseti. Isolations and pathogenicity tests were made on two separate occasions. F. poae has previously been found associated with root rot of rape. Present evidence indicates that Fusarium root rot of rape is usually caused by the combined action of two or more species. To date, the wilt-producing species F. oxysporum f. conglutinans has not been detected on rape in Saskatchewan.