CROP: Canola
LOCATION: Alberta

NAMES AND AGENCIES:
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TITLE: THE OCCURRENCE OF CLUBROOT ON CANOLA IN ALBERTA IN 2010

METHODS: A total of 341 commercial canola (*Brassica napus* L.) crops in 16 counties in central Alberta were surveyed for the incidence of clubroot (Table 1), caused by the obligate parasite *Plasmodiophora brassicae* Woronin. Of these crops, 29 were confirmed to be clubroot-resistant canola hybrids. With one exception, the crops surveyed were all in fields where clubroot had not been previously identified. The survey was conducted in September and October, 2010, with the crops visited after swathing. The roots of all plants within a 1 m^2 area at each of 10 locations along the arms of a 'W' sampling pattern were dug from the soil and examined for the presence of galls, which were taken as an indication of *P. brassicae* infection. The severity of root infection on each sampled plant was assessed on a 0 to 3 scale, adapted from Kuginuki et al. (1), where 0 = no galling, 1 = a few small galls, 2 = moderate galling and 3 = severe galling. The individual ratings were then used to calculate an index of disease (ID) for each field, according to the method of Horiuchi and Hori (2) as modified by Strelkov et al. (3). Visits to fields were coordinated with the Agricultural Fieldman in each municipality.

RESULTS AND COMMENTS:
Sixty seven of the 341 canola crops surveyed were found to be clubroot-infested, of which 66 represented new cases of the disease (including two in the County of Lamont, representing the first confirmed cases of clubroot in that municipality) (Table 1). A very low level of disease was also found in one field that was first identified as clubroot-infested in 2005, but which was cropped to a resistant canola hybrid in 2010. Clubroot was detected in 15 of 29 fields cropped to a resistant canola hybrid, and in 52 of 312 fields cropped to susceptible hybrids or hybrids of unknown resistance. Clubroot severity within the infested resistant crops was low (ID <10%) in 12 fields, and moderate (ID = 10-30%) in 3 fields. In the infested susceptible crops, disease severity was low in 31 fields and moderate in 21. No heavily infested crops were identified in the 341 fields visited, perhaps because fields with severe clubroot infestations would have been sown to a resistant cultivar. In addition to the infested canola crops found in this survey, another 27 new cases of clubroot were identified in a survey conducted by the County of Leduc (A. Van Beers, personal communication), and another 16 in a survey conducted by Parkland County (T. Warren, personal communication). Therefore, a total of 110 new cases of clubroot on canola were confirmed in Alberta in 2010. A new case of clubroot was also identified on cabbage and broccoli in a field in northeast Edmonton (1). A total of 566 fields in Alberta are now confirmed to be infested with clubroot. These fields are distributed over 18 counties throughout the province as well as a rural area of the City of Edmonton. However, the outbreak remains most severe in central Alberta (Fig. 1).

This year (2010) marked the first time that clubroot-resistant canola hybrids were readily available to Alberta farmers. The deployment of genetically resistant cultivars represents one of the most effective and economical methods to manage clubroot. It is interesting to note, however, that at least some clubroot symptoms could be found in more than half of the resistant crops surveyed. This could reflect several possibilities, including the presence of susceptible volunteers and off-types, as well as the fact that while most resistant hybrids exhibit highly reduced symptoms of infection, they are not generally immune. It is also likely that most resistant crops were planted in fields with established clubroot infestations, and thus were exposed to high disease pressure. Nevertheless, the occurrence of clubroot in resistant hybrids could have epidemiological implications and highlights the need for appropriate clubroot resistance management strategies.

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Table 1. Distribution of clubroot-infested canola fields identified in Alberta in 2010.

County	Number of fields surveyed	Number of clubroot-infested fields (new cases)
Barrhead	18	5
Camrose	21	3
Flagstaff	19	0
Lacombe	21	0
Lac Ste. Anne	21	0
Lamont	23	2
Leduc	34	16[a]
Parkland	20	11[b]
Ponoka	22	3
Red Deer	18	0
Strathcona	26	10
Sturgeon	18	5[c]
Thorhild	19	0
Westlock	26	7
Wetaskiwin	16	4
Yellowhead	19	0
TOTAL	341	66

[a]An additional 27 clubroot-infested fields were identified in a survey conducted by the County of Leduc, bringing the total number of new cases in that municipality to 43
[b]An additional 16 clubroot-infested fields were identified in a survey conducted by Parkland County, bringing the total number of new cases in that municipality to 27
[c]A small amount of disease was also found in a sixth field in Sturgeon County, which was cropped to a resistant cultivar, but was excluded from the totals since it had originally been identified in 2005

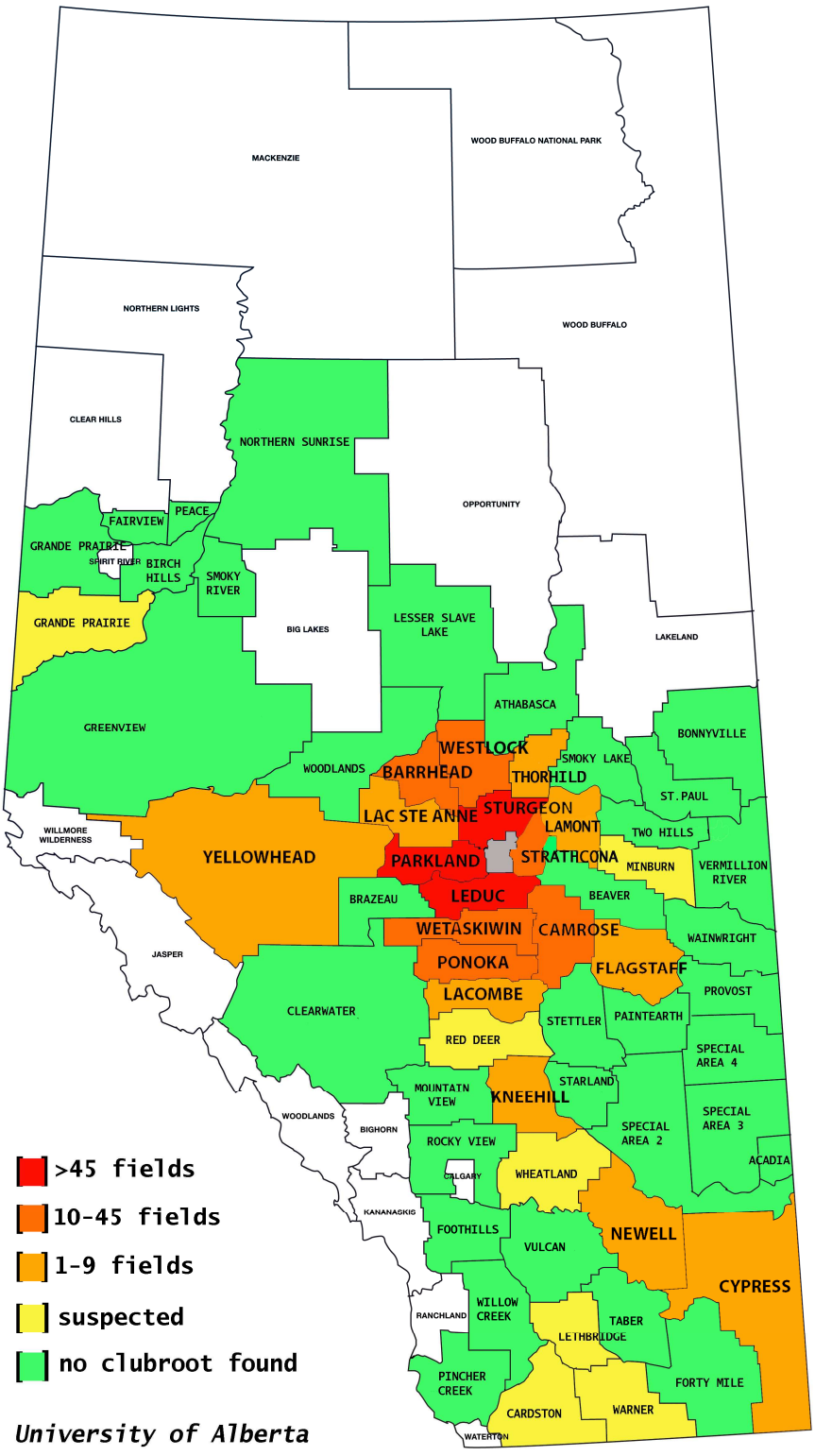

Figure 1. Occurrence of clubroot on canola in Alberta as of October 2010. The disease has been confirmed in a total of 566 fields representing 18 counties and a rural area of the City of Edmonton. In addition, suspected cases of clubroot have been reported from at least seven other municipalities.