

# 2000 Canola Disease Survey



## 2000 Canola Disease Survey in Minnesota, North Dakota and South Dakota

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A field survey in North Dakota, Minnesota and South Dakota evaluated the incidence (percent infected stems) of aster yellows, blackleg, *Sclerotinia* stem rot, and the pod severity (percent infected pod area) of *Alternaria* black spot in 2000. The survey was conducted in 282 fields in 31 counties of the three states: 206 fields in 20 counties of North Dakota, 55 fields in six counties of Minnesota and 21 fields in five counties of South Dakota.

**Materials and Methods.** The survey techniques were adapted from those used by Petri *et al.* in Saskatchewan (3). The fields were inspected for disease when the crop was in the swath and the stubble was freshly cut. All fields surveyed were Argentine canola, *Brassica napus*. Five stems were sequentially pulled from the soil at each of eight randomly selected locations for a total of 40 stems examined in each field. The lower stems and roots of the plants were visually inspected for symptoms of blackleg and *Sclerotinia* stem rot. These diseases were easily identified on freshly cut 6- to 18-inch stubble left in the fields.

Blackleg was identified by the black girdling lesions at or near the soil surface. Tiny black pycnidia characteristic of the virulent strain of the blackleg fungus often were associated with the lesions. In cases where the cause of the disease was in doubt, the roots of plants were split with a knife and the interior tissues inspected. If they were dark gray to black, rather than white, the root was considered to be positive for blackleg.

Sclerotinia stem rot was identified by the bleached stems, often accompanied by a shredding of the tissues. The presence of sclerotia inside the bleached tissues helped confirm *Sclerotinia*.

At each of eight random sampling locations, the swath was inspected for symptoms of aster yellows. Counts of aster yellows might be considered estimates rather than accurate counts because it was difficult to randomly sample five plants at each stop. Aster yellows symptoms used to identify the disease included bladderlike upper pods and a witch's broom or proliferation of tissues on the upper portions of the plant.

Ten pods were inspected for *Alternaria* black spot at each of four random locations per field for a total of 40 pods. Pod severity (percent of pod area affected) was assessed using the scale of 1%, 5%, 10% and 20% devised by Conn *et al* (1). Pod severities and incidence in northwestern North Dakota were extremely low and are not included in this report.

Counties were surveyed based on acreage in 1998 and 1999. The objective was to survey counties with the greatest acreage. An attempt was made to visit at least 10 fields in any county surveyed so there would be an adequate sample size to compare results among counties.

**Results.** Aster yellows incidence was 4.5% in North Dakota, 3.9% in Minnesota and 3.8% in South Dakota. The highest incidences were 9.4% in Roseau County, MN; 9.4% in Cavalier County, ND; 8.3% in Polk County, MN and 6.7% in Campbell County, SD.

Blackleg incidence was 2.8% in North Dakota, 0.5% in Minnesota and 0.17% in South Dakota. The highest incidences were 7.4% in Burke County, 6.0% in McLean County, 6.0% in Mountrail County, and 5.1% in Bottineau County, all in North Dakota. Losses are calculated to be 0.7% for each 1% incidence, or 5.2% in Burke County, 4.2% in McLean and Mountrail counties and 3.6% in Bottineau County, ND.

The average *Sclerotinia* stem rot incidence was 17.0% in North Dakota, 17.8% in Minnesota and 6.5% in South Dakota. The highest incidences were 32.8% in Ramsey County, ND; 30.5% in Benson County, ND and 26.0% in Towner County, ND. The state incidence of 17.0% in North Dakota was the highest in North Dakota since an 18.7% incidence in 1993. The

state incidence of 17.8% in Minnesota was the highest in Minnesota since an 18.8% incidence in 1997. The state average of 6.5% in South Dakota was the highest in any survey year (1996, 1997, 2000), greater than the 3.3% recorded in 1997 (Fig. 1).

Data on yield trials with *Sclerotinia* indicate a 0.5 to 0.7% yield loss for each 1% of infected plants (2). Since only plant stubble was inspected and infections farther up the plant could not be assessed, the higher figure of 0.7% was used to estimate seed yield losses. Thus, incidences of 17.8% in Minnesota, 17.0% in North Dakota and 6.5% in South Dakota represent estimated yield losses of 12.5%, 11.9% and 4.6%, respectively.

Fields with more than 30% *Sclerotinia* were considered to be fields with an economic loss, since this incidence represents an estimated 21% yield loss, an incidence at which a fungicide application would be economic. There were 44 of 206 surveyed fields in North Dakota, or 21%, with an economic loss and 12 of 55 surveyed fields in Minnesota, or 22%, with an economic loss. There was an economic loss in one field in South Dakota, or 5%.

*Alternaria* black spot severity was 0.3% in North Dakota, 0.4% in Minnesota and 0% in South Dakota; losses from black spot are estimated to be less than 1% in all states.

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