INTRODUCTION

Sclerotinia stem rot (SSR) is caused by the fungus *Sclerotinia sclerotiorum* (Lib.) de Bary. Losses caused by this disease to the canola industry between 1991 and 2002 have been estimated in more than $94 million (1). The spatial attributes of SSR epidemics are not thoroughly understood. Previous studies in crops other than canola, have shown that the majority of ascospores are deposited within a few meters from the source of inoculum, while others indicate that significant amounts of inoculum could travel several miles (1, 2, 4, 5). This apparent controversy, plus the fact that the canopy formed by canola plants is different than those used in the studies mentioned above, warrant research efforts to characterize the spatial attributes of SSR epidemics in canola fields. This poster presents results of a study that addresses this issue.

MATERIALS and METHODS

In the spring of 2005 experimental plots (70x70 m) established in commercial canola fields in Cando and Langdon, ND were treated with 4 kg/ha of Contans active ingredient is spores of *Coniothyrium minitans* Campbell. After planting, plots were divided into 20 quadrats (7x7 m). Weather sensors were installed in the middle of the experimental fields soon after plant canopy had closed. Sensors recorded information about soil and air temperature, soil moisture, precipitation, relative humidity, and leaf wetness every hour. Passive spore sampling was conducted by placing dishes containing blue medium (3) in the middle of each quadrat (Figure 1a). Active sampling was conducted using Anderson spore samplers with blue medium or an Osborne volumetric trap (Figures 1b and 1c). Disease incidence and severity were recorded at the end of the season (harvesting date).

RESULTS

SSR incidence was highest close to the edge of the untreated area and decreased linearly with distance ($R^2= 0.93$, $P= 0.001$) into the Contans-treated area (Figure 2). At the edge of the untreated area SSR incidence was on average 30%; however, some 40 m into the treated area, disease incidence was reduced by 50% (Figure 2).

DISCUSSION

A 50% reduction in disease incidence was detected 40 m away from untreated areas; however, a plateau was not reached, suggesting that ascospores may travel longer than 40 meters. Nonetheless, such a reduction in incidence would result in non-economical damage to the crop. Thus, 40 meters could be used as a distance threshold. Similar reductions were observed by Wegulo et al. (5) in soybean fields. The amount of ascospore trapped were higher in the first two weeks of flowering and then started to decline. Peak spore production was positively associated with relative humidity. The lack of a significant correlation between soil moisture or air temperature with the amount of spores trapped may be an indication that these variables were not a limiting factor for spore release.

Figure 1. Spore trapping methods used to monitor spore population dynamics: A) dishes containing blue medium; B) Anderson sampler with blue medium; and C) Osborne 7-day volumetric spore trap.

Figure 2. Disease incidence in four transects in a commercial canola field adjacent to an infected canola field in Cando.

Figure 3. Daily mean temperature (°C), relative humidity (%) and precipitation (mm) between June 17, 2005 and August 10, 2005.

Figure 4. Daily soil moisture (100 kPa = 1 bar) between June 17, 2005 and August 10, 2005.

Figure 5. Dynamic of spore production (Jun 24 - Jul 28, 2005) in a canola field in Cando, N.D. Arrow indicate peaks of spore production.

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**Literature cited**


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