

Control of Sclerotinia Head Rot in Sunflower

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Impact Statement:

A significant reduction in head rot will significantly reduce the losses in yield and quality, and increase profits to the sunflower industry at large.

Introduction:

Head rot caused by *Sclerotinia sclerotiorum* (Lib.) de Bary is widely spread in sunflower growing areas in North America. There has been a steady increase in the incidence and severity of Sclerotinia head rot in recent years (Fig. 1). The sunflower crop in Manitoba was devastated by this disease in 2004 where the severity of head rot reached up to 80% resulting in heavy yield reductions and total losses in many fields (Fig. 2). In a normal growing season, most head infections occur during the 2-3 weeks flowering period (Fig. 3). This study aimed at assessing the efficacy of fungicides in reducing the head rot severity, and avoiding the heavy losses in yield and quality of seed.

Materials and Methods:

- Oilseed Susceptible sunflower hybrid
- 3 -row plots, RCBD with 4 replicates.
- 9 Fungicides at three treatments each
 - Single application at early flowering
 - Single application at late flowering
 - Two applications, early and late
 - Backpack sprayer with hand-held nozzle

Artificial Inoculation;

- Ascospores & ground sclerotinia-infected millet seed
- Applied to sunflower heads 24 h after fungicide applications
- Misting at 5 mn/30 mn for 3 wks when needed.

Disease Assessment

- Heads were assessed weekly,
- Scale of 0 to 5 (severe)
- Disease index was calculated.
- Measured Yield, % oil, KD, KWT

- Sclerotia in harvested seed.

Results:

The prolonged unusual cool and wet conditions throughout the 2004 season were ideal for head rot infections and development. The artificial inoculation with ascospores and ground infected-millet seed under the misting system resulted in high head rot incidence of 77% and a disease index of 7.3 in the control treatment. The fungicides JAU6476, Benlate, and Lance, significantly reduced the head rot incidence to 52-57%, and diseases index to 4.5-6.1 depending on one or two applications (Fig. 4). Ronilan and Quadris reduced the head rot incidence to 60-63% and disease index to 5.8-6.9. Fluazinam, Maxim and Topsin reduced the head rot incidence to 60-70% and disease index to 5.4 -7. All fungicide applications resulted in significant yield improvement (Fig. 5) and significant reductions in sclerotia in harvested seed (Fig. 6).

Conclusions:

One application of JAU6476, Lance, and Benlate significantly reduced the severity of head rot and the number of sclerotia in seed samples and increased yield.

Two applications were better than one.

Ronilan and Quadris significantly reduce d head rot and increased yield.

Fluazinam, Maxim and Topsin reduced head rot and increase yield ?

Ground sclerotinia -infected millet and ascospore inoculum produced severe head rot infections.

Need further studies to confirm the efficacy of some fungic ides, fine-tune the dates and number of applications

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