High virulent races are prevalent causing major losses that can be avoided by incorporating genetic resistance in sunflower hybrids.

Introduction

Sunflower (Helianthus annuus L.) is commonly grown in Manitoba on ~60,000 ha, ~70% confections and ~30% oilseed types. Rust Puccinia helianthi Schwein is a major sunflower disease worldwide. It completes its life cycle on sunflower (Figures 1 & 2) with Urediospores from infected leaves were collected, suspended in petroleum oil and inoculated onto seedlings of the international set of nine rust differential genotypes (Table 2) under controlled growth room conditions. The reaction for each isolate/genotype determined the race identity of each rust isolate.

Material and Methods

Sunflower fields have been annually surveyed in most of the crop growing areas in Manitoba. Data collected includes the rust incidence and severity based on % leaf area infected (Fig. 3). Recent, a major shift occurred from low virulent groups 100 & 500 to the high virulent groups 300 & 700 (Table 4).

Results and Discussion


Recently, a major shift occurred from low virulent groups 100 & 500 to the high virulent groups 300 & 700 (Table 4). The most virulent race 777 appeared in 23% of 2009 isolates but not in 2010-11 perhaps due to a lack in fitness and a sharp decline in sunflower acreage. However, race 777 reappeared in 5-10% of the 2012-2014 isolates, and in 75% of the 2015 isolates (Tables 2-4).

Conclusions

- Low frequency of the low virulent race-groups 100 & 500.
- Shift to high virulent races 300/700.
- In 2009: 726, 736, 737, 776 = 52% 777 = 23%.
- In 2010-11: 726, 736, 766, 776 = 100%.
- In 2012-13: 724, 726, 736, 776 = 90% 777 = 5%.
- In 2014: Race-group 300 = 60%
  Race-group 700 = 40% 777 = 10%.
- In 2015: Race-group 300 = 15%
  Race-group 700 = 85%, 777 = 75%.
- The new Races are virulent on most commercial sunflower hybrids.

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