

# Seedling Diseases, Insects, and Seed Treatments

F. L. Dokken-Bouchard<sup>1</sup>, S. Hartley<sup>1</sup>, and T.K. Turkington<sup>2</sup>

<sup>1</sup>Saskatchewan Ministry of Agriculture, 3085 Albert Street, Regina, SK, S4S 0B1

<sup>2</sup>Agriculture and Agri-Food Canada, Lacombe Research Centre, Lacombe, AB, T4L 1W1

**Key Words:** plant disease, insects, seed treatments

## Seedling Diseases & Seed Treatments

As we saw in 2010, plant diseases have a greater impact in wet years; but why? Most of the plant diseases occurring in western Canada are caused by fungal organisms. Fungi either break down dead plant material in the environment (saprophytes) or infect and feed on host plants (pathogens). Either way, various aspects of the fungal life cycle are often promoted by moist conditions. Further more, excess moisture can also affect plant susceptibility to disease either through stress or by affecting the growth stage during which the pathogen is most likely to infect. Seed and seedling health are important to get the crop off to a good start. Environmental stresses and seed/seedling diseases can compromise the crop early on, leading to poor crop performance for the remainder of the growing season. Seed and seedling diseases may be soil/residue or seed-borne. Seed testing is a great way to assess the health of a seed lot prior to planting. For soil-borne diseases it is important to know the history of disease incidence in a field. Seed treatments can be used to combat many diseases as well as some insects, but it is important to consider the advantages and disadvantages of seed treatments.

In general, the disease outlook for 2011 will depend on the interaction of components of the disease triangle: pathogen (field history/inoculum and seed-borne disease levels), host (crop rotation, variety, and plant health), and most importantly environmental conditions. Significant disease development in 2010 has likely resulted in the production of ample seed-, soil- and residue-borne inoculum for a number of plant pathogens that can then threaten the 2011 crop. Given this reservoir of inoculum, a wet season in 2011 could mean another year with increased disease.

## Insects

The excessively wet conditions in 2010 negatively impacted many insect populations, especially those that develop best under warm, dry environmental conditions. The wheat midge is a notable exception. Wheat midge populations tend to increase under with moist conditions. Prior to the 2011 growing season there are potential risks that should be considered. Proper storage of seed is important to prevent insect pests that could affect grain quality. It is important to identify the insect of concern whether in stored or cropping situations to determine best management options or if control is required.

The Saskatchewan Ministry of Agriculture utilizes various methods to provide an estimate of risk for certain important pests on a regional basis. In season monitoring includes evaluating air

currents capable of bringing diamondback moths from the Southern United States and Mexico. Pheromone traps, with lures specific to diamondback moth and bertha armyworm, are set up by co-operators to estimate adult populations of these insects prior to the damaging larval stage. The risk from grasshoppers and wheat midge is based on surveys of populations (observations of adult numbers and viable cocoons present in the soil respectively) the previous fall.

Seed treatments are key for controlling infestations of wireworms (Coleoptera: Elateridae), flea beetles (Coleoptera: Chrysomelidae) and pea leaf weevil. Various species of cutworms caused serious damage in Saskatchewan in 2010 but the extent of infestations in 2011 is unknown. Grasshoppers are expected to be of low risk for most of the Province. However some risk exists, particularly in the southwest. Grasshoppers, cutworms and wheat midge are examples of pests controlled by foliar insecticide application if necessary.

Seeding rates, date of seeding, crop rotation, and choice of crop varieties for resistance or tolerance are considerations for managing certain insect pests. Higher seeding rates of canola will help to compensate for root maggot feeding. Management strategies include sowing solid-stemmed wheat varieties for wheat stem sawfly. Newly developed midge tolerant wheat varieties are also available.