DISEASES AND DISORDERS OF CORN

Disease outbreaks are a result of three things: the presence and type of pathogen, the status of the host, and the environment that influences the pathogen and the corn plant. To effectively manage corn for disease, it is best to prevent or manage a disease outbreak when the disease is at low levels, instead of when the crop is infested.

Points for managing disease prevention:

* Scout weekly — identify diseases, mapping problem areas;
* Review field history;
* Planting disease-resistant varieties;
* Crop rotation; and
* Use a tillage system that chops and covers corn residues with soil, when possible.

Field scouting on a weekly basis can provide information on what diseases are present, the severity and potential for crop loss if untreated. There is no better way of determining the status of disease on a corn crop, than actually being in the field to view these problems for yourself. Through crop scouting you can make informed decisions on what management tactics should be employed. Reviewing the field history, identifying the diseases, and mapping the location of disease problems in the field are all beneficial investments of time that will assist in the management of corn diseases.

The decision on what variety/varieties of corn to grow can be a difficult one, and accounting for the disease resistance can increase the difficulty. In some cases, higher yield performance and a high level of disease resistance may not be possible (as in the cases of stalk rots), or resistant varieties may not even be available. Whenever possible, it is always a good idea to use varieties resistant to a disease, especially if a particular disease has been a problem in the past.

Growing corn in the same field for successive years may be desirable for several reasons. There are risks, however, in not rotating other crops through the field, as population of corn disease organisms can increase over time, increasing the likelihood of a large outbreak of disease with subsequent crop loss. In areas where disease is becoming a problem, the field should not be planted with corn for several years in order to reduce the pathogen level (and the risk of disease outbreaks) in the field. Generally diseases of corn are not of great concern in Manitoba, however we were introduced to Goss's Wilt in 2009, and there are also increasing instances of crop loss due to root and stalk rots, in addition to the recurring problems of both common and head smut.

Brief descriptions of the more common diseases observed in Manitoba corn are provided here, along with a section on nematodes, which have not been reported as a problem in Manitoba, however could be in the foreseeable future. General recommendations for disease management are also included. Specific information on disease management can be found in the Guide to Crop Protection, published annually by Manitoba Agriculture, Food and Rural Initiatives.

Damping-off and Seedling Blight

When to look for: End of May to end of June

Caused by a large number of soil and seed-borne fungi.

Germinating corn kernels may be attacked and severe infection may kill the embryo before germination (pre-emergence seedling blight) or destroy the seedling before or after emergence (post-emergence seedling blight).

These diseases are prevalent in poorly drained, cold and wet soils.

Planting depth, soil type, age and quality of seed, mechanical injury to the seed coat, and genetic resistance to infection all influence disease severity.

Disease organisms responsible for seed rot and seedling blights can be divided into two main groups:

1. Pathogens in or on the seed at planting

2. Pathogens in the soil at planting

Symptoms:

Poor stand establishment

Varying emergence

Gaps in rows

Stunting, yellowing, wilting and death of leaves on individual plants.

Seed rots and blights may be confused with mechanical or chemical injury or insect damage. Examination of plant parts under the ground is therefore necessary for accurate diagnosis. In pre-emergence seedling blight, the coleoptile and developing root system appear brown, wet and slimy. In post-emergent seedling blight, the seedlings may have a constricted stem at the soil line, appear yellow, wilt and die.

Disease Cycle :

Strands of fungal growth (mycelium) contact seed or seedling tissue and enter the seed through cracks in the seed coat or by direct penetration.

The mycelium grows rapidly through and between the cells, killing the seed. Similar attacks may occur through rootlets and stems by direct penetration or through wounds.

The mycelium proliferates in young cells causing rapid collapse and death of tissues.

Management

Plant injury-free seed of resistant varieties

Follow good cultural practices: plant in warm, moist soil; prepare seed bed properly; correct fertilizer placement

Seed treatments