

Challenges in Forage

by Will Feenstra

Agriculture today is hardly recognizable compared to what it was a century ago. Sure, during the mid-summer, when all our crops have been planted and are growing tall, we could argue that things are no different now than when Grandpa ran the farm. But, when we watch planting and harvest, there is evidence of vast change. Some of the obvious changes can be seen in the size of our equipment, the type of our equipment, the speed at which we operate, and the number of acres per farm. Yields per acre have also increased tremendously, some due to the quality of today's seed, and some due to fertilizers that have been made available. One thing that cannot be overlooked, however, is the increase in pest and disease pressure that seems to plague just about every crop being grown today, including forages. Potato leaf hoppers and Verticillium Wilt are two major issues that farmers are facing when growing forage. Ontario alone grows about two million acres of forage, and has about 1.6 million acres in pasture feeding over 1.2 million head of Dairy and beef cattle, horses, sheep, and goats. In this article I want to discuss the cause of, the effects from, and the solution to the pest and disease issues that are plaguing our forage crops.

The potato leafhopper is a pale, yellowish green insect that is about 1/8 inch long and has wings. The young, known as nymphs, are smaller, have no wings and are mostly yellow with tinges of green. Potato leafhoppers cannot survive the cold winters of Canada, but they do



migrate in from warmer climates through storm clouds. The adult potato leafhopper is stimulated by low pressure systems to fly into updrafts that draw it into clouds to be transported by the direction of the storm and dropped by the down drafts in front of these storms. As soon as the adult female leafhoppers drop into the fields, they lay their eggs in alfalfa stems and leaf veins. The population of potato leafhoppers can grow very rapidly as they reach maturity in just three to four weeks after hatching. Potato leafhoppers feed by sucking plant sap from alfalfa tissue, doing most of their damage from mid-June to mid-August. Damage done by potato leafhoppers, just like many other sources of plant stress, causes a significant decrease in yield. Although there have been great advances in the types of chemicals used to kill insects, these chemicals do not choose which insects they will kill. The result is that they also destroy the beneficial microbes that play an important role in releasing minerals that feed and strengthen the alfalfa plant.

One thing to note is that potato leafhoppers move on when a plant's carbohydrate levels increase to a level that is intolerable to the insect.

Here in lies the answer to preventing initial infestation and in keeping your valuable alfalfa free from pests and growing strong. High levels of carbohydrates are attained when a plant gets adequate nutrients necessary for forming these carbohydrates. Ironically, when chemicals are used to eliminate insects and kill fungal and bacterial disease, plants that are sprayed have a reduced ability to take in nutrients which hinders and the production of carbohydrates, which actually makes the plant more susceptible to insects and disease.

Verticillium Wilt is a serious disease that plagues alfalfa and is responsible for major yield loss. Verticillium Wilt was first discovered in Europe in the early to mid-1900. Verticillium Wilt causes yellowing in alfalfa due to the presence of a toxin which is produced by the colonization of the fungus inside the water conducting tissue (the xylem), plugging it and limiting water movement in the plant. Bunchy tops, short internodes and upward curling of leaves on stems are symptoms of Verticillium Wilt. Diseased leaves look wilted and pinkish to yellow in colour compared to healthy leaves. Verticillium Wilt may infect alfalfa plants through the roots or through the stem during harvest. Verticillium Wilt occurs when a plant is stressed due to lack of nutrients such as phosphorus, calcium, and boron (which aid in the transfer of other nutrients and carbohydrates in plants), or attack by pests such as the Potato leafhopper.



Alfalfa is long known as the "queen of forage" due to its high nutritional value for livestock. Because of the great economic value of alfalfa, it is important to monitor its growth, health and performance by measuring brix and tissue nutrient content frequently using common tools such as the refractometer and tissue analysis. This will allow you to ensure that your plant has the right balance of minerals so that it can stay free of pests and disease. ■

"All disease is the result of a mineral deficiency"
- Dr. Carey Reams



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