Strong, Healthy Root Systems Lead to Higher Productivity, Increased Profit Potential

More and more research is pointing to root health as the key to increasing crop productivity in the future. Why? Healthy roots lead to:

- Protection against yield-robbing insects and diseases below the soil surface
- More efficient water and nutrient uptake
- The development of stronger stems and foliage that better withstand environmental stress
- Protection of the crop’s genetic potential

Roots are responsible for several important jobs, including anchoring and supporting the plant in the ground. They also hold soil in place, break up soil to create pathways for better water filtration, and absorb water and nutrients.

Syngenta Seed Treatments: Protectors from Pests, Builders of Strong Root Systems

As part of an ongoing commitment to root health and post defense, Syngenta offers growers a strong portfolio of leading seed treatments and has taken the initiative to develop new active ingredients specifically as seed treatments designed to improve root health.

In addition to our current cereals seed treatment products below, Syngenta is anticipating registration for a new seed treatment fungicide in 2012 that will help further maximize root health and yield potential.

Dividend Extreme

Built-in Protection from More Than 15 Early-season Diseases for Better Cereals Stand Establishment

- Provides unsurpassed protection against more than 15 early season seedborne, soilborne and foliar diseases to produce healthier root systems and stronger, more vigorous plants
- Offers healthier root systems and stronger plant stands to help winter wheat better prepare for dormancy and promote better spring crop vigor
- Delivers consistent performance under a wide range of growing conditions
- Protects plants and promotes more vigorous root growth even under heavy infection of Rhizoctonia species

Cruiser

Convenient, Seed-delivered Insect Protection in Cereals for a Healthier, More Vigorous Stand

- Provides convenient, seed-delivered protection against wireworms, aphids and early seasonbean fly
- Helps produce healthier, more vigorous plants under certain conditions, even in the absence of insect pressure
- Increases yield potential through the Thiamethoxam Vigor Effect
- Reduces the risk of the crop transmitting barley yellow dwarf virus by protecting against aphids that vector the disease
- Provides peace of mind by delivering consistent performance under a wide range of growing conditions
- Protects a stronger plant stand, increased root mass, thicker stems, and taller and greener plants

Cruiser Maxx

Protection in One Consistent, On-seed Formulation

- Provides excellent protection against both insect and disease in one convenient formulation, eliminating the need to mix products
- Delivers the power of three chemistries in one easy-to-use formulation effective at a single use rate
- Offers the option for seedsmen or private applications so growers can make timely seed selection decisions to help capitalize on market opportunities
- Protects early season stand to promote healthier seedlings and stronger plant stands to reduce stress throughout the season

Root Health, According to the Experts

“Root health is a term that plant pathologists have used for many years to describe a plant root that has very little disease. Healthier, more robust root systems help plants better utilize available nutrients and moisture.”

—Wayne Pedersen, Ph.D., emeritus plant pathologist, University of Illinois

“Root health means that plants can live up to their full genetic potential, and can use the most sustainable practices with the least environmental impacts.”

Tim Paulitz, Ph.D., research plant pathologist, USDA-ARS, Washington State University

Key Pests Impacting Root Health in Cereal Crops

Underground diseases and insects are the prominent threats to the development of a strong, healthy system. Key pests to watch for in wheat and barley include:

- Pythium: one of the most prevalent disease pathogens attacking cereal crops and often recognized as winter injury, poor soil fertility or toxicity from crop residues. Pythium feeds on the root system and results in spindly plants with whitened and discolored leaves, fewer tillers and smaller heads. Pythium is difficult to control once it has begun, and rapid death of crops occurs once infection occurs. Delayed emergence and poor plant development are common symptoms of Pythium.

- Fusarium: attacks the outside of the seed and the seedling by way of a large and many other crops. These infection points act as inoculum for a new round of infection in the next crop when conditions are right. However, the immediate threat is to the seed. If infected, the seed may die, germinate poorly or encounter seedling blight as it germinates. Common root rot causes stunting and sometimes wilting of infected wheat, barley and oat seedlings. Later, these plants turn yellow and die. Roots of diseased seedlings are rotted, red-brown in color and may be covered with a mass of white, gray or pink mold.

- Rhizoctonia: infects the entire root system and is quickly establishing itself as one of the most prominent seedborne pathogens affecting U.S. cereal growers. Rhizoctonia is capable of causing 20 to 40 percent yield loss. This fungus can cause preemergence or postemergence damping-off of seedlings, as well as plant wilting. Infected stems often break in the lesioned area, and roots may die from a firm, dry brown or red-brown discolor.