



**Protect
Against
Asian Rust
from the
Ground
Up**

Mosaic




ASIAN SOYBEAN RUST HAS BEEN PREVIOUSLY SEEN IN ONLY AFRICA, ASIA, AUSTRALIA AND SOUTH AMERICA. FIRST REPORTED IN THE UNITED STATES IN NOVEMBER 2004, ASIAN

soybean rust was identified in nine states where soybeans were still growing or other host crops were infected. Because this serious fungal disease can cause yield losses ranging from 10 percent to 80 percent, growers should be concerned.

Until now, research efforts on how to control Asian soybean rust have focused on fungicides and genetics. Growers should be aware that plant nutrition influences a crop's susceptibility and tolerance to disease.

“Balanced soil fertility is important to maximize yields and quality, and we know that complete plant nutrition is vital for a plant’s ability to resist disease. Growers need to be aware of how their soil fertility levels meet, or do not meet, the needs of their soybean crops, especially when a new disease like Asian soybean rust threatens.”

Dr. Cliff Snyder, Southeast Director, PPI



BALANCED SOIL FERTILITY HELPS GUARD AGAINST DISEASE

While fungicides are the most important tools in a grower's fight against Asian soybean rust, much is also known about the influence of plant nutrition on susceptibility and tolerance of crops to disease. A balanced soil fertility program can help plants reduce the negative effects of disease. Growers should be aware of these nutrients in particular:

- Potassium (K) deficiencies encourage disease infection by reducing the ability of the plant to resist fungal organisms. If crops are deficient in K, growers may notice weakened stalks and stems as well as smaller, shorter roots. Thin cell walls, accumulated sugar in leaves and unused nitrogen (N) are also symptoms, though invisible to growers. Soybean stem canker infection has been associated with low soil K levels.
- Chloride (Cl) can reduce the damage done by many fungal diseases in wheat, barley, corn and sudden death syndrome in soybeans. Applying muriate of potash (KCl) can increase Cl levels in the plant and help lessen the effects of these diseases.
- Phosphorus (P) often works together with K. In research on rust-infected soybeans in the Philippines, the effects of NPK fertilization were studied. Some rust suppression was seen when either P or K was applied, but the greatest suppression occurred when intermediate levels of both nutrients were used.
- Manganese (Mn) is thought to be the most important micronutrient involved in a plant's development of disease resistance. Studies have shown that tissues susceptible to fungal diseases are usually





lower in Mn. Some newer, glyphosate-resistant soybean varieties, however, may have reduced capacity to take up Mn.

What can growers do?

The possible threat of Asian soybean rust is just one more reason for soybean growers to incorporate and follow a balanced soil fertility program. Growers should be sure they:

- Are current on soil tests, especially for fields being planted to soybeans. Local agronomists and crop consultants can help growers use a sound sampling protocol to capture any manageable variables in the field.
- Follow recommendations resulting from their soil tests. Trusted local experts can help prioritize and manage these recommendations.
- Since Cl can leach from the root zone, apply muriate of potash (KCl) and P if applications have not been made before soybeans in the rotation. Growers with crops in “flatwood soils” in the southeastern United States should consult with an adviser first, as these soils often have poor internal drainage and salts gather in the root zone, which may contribute to Cl toxicity.
- Collect plant samples for tissue analysis. This can be done while growers are routinely scouting for Asian soybean rust. Experts say this is the perfect opportunity to make sure the crop is getting the right amount of nutrients from the soil and recommend



- including assessment of Mn during plant analysis.
- Keep accurate, detailed field notes. Good records on all aspects of crop production will help growers monitor nutrient use and refine management.

“We know that growers are concerned about the threat of Asian soybean rust. We also know research has shown that improving soil fertility can increase crops’ resistance against many diseases.”

Dr. Ray Hoyum, international specialty marketing and new product development for The Mosaic Company



For more resources and information on how a balanced soil fertility program can help growers fight Asian soybean rust, contact Randy.Groff@mosaicco.com.

Source: "Nutrient Management of Soybeans with the Potential for Asian Rust Infection." Paul E. Fixen, Cliff S. Snyder, Harold F. Reetz, Jr., T. Yamada and T. Scott Murrell, Potash & Phosphate Institute (PPI)/Potash & Phosphate Institute of Canada (PPIC) and Foundation for Agronomic Research (FAR), 2005

