Scientists Seek to Unlock Secret of Soybean N Usage

Researchers at the University of Missouri are working on a project that could help answer one of the mopst puzzling questions of soybean research: Where does the soybean plant get all of its nitrogen?

Under normal field conditions, an acre of soybeans with a 50-bushel yield takes up 30 pounds of nitrogen per year from the air. From decomposed organic matter in the soil, the 50-bushel crop draws an additional 50 to 100 pounds of nitrogen.

However, it is known that this same 50-bushel crop actually takes up a total of 300 pounds of nitrogen. Where does the additional 170-220 pounds of nitrogen come from? Researchers don't know.

With so little knowledge of how the soybean plant obtains nitrogen, and in view of the soybean's need for such large amounts of the element, researchers fear that nitrogen could some day become a limiting factor in producing higher yields.

To prevent this from happening, the American Soybean Association (ASA) Research Foundation is funding a project at the University of Missouri to learn more about how the soybean plant obtains and metabolizes nitrogen.

When the project began, it was believed that the soybean plant converted nitrogen into amino acids, the building blocks of protein, in only two ways:

– Nitrates from the soil are transported to the leaves, where they are converted, or reduced, to amino acids. This process occurs largely in the early part of the growing season.

-- A strain of bacteria called rhizobia form nodules on the roots of the soybean plant and draw nitrogen from the air for the plant to use. This occurs in the latter part of the season.

However, researchers at the University of Missouri soon made an important discovery: The nodules not only fix atmospheric nitrogen, but also reduce a significant amount of nitrates from the soil.

In fact, early results indicate that nodules may be more important for the reduction of soil nitrates than for the fixation of atmospheric nitrogen.

This new information changes the whole picture of soybean metabolism research and gives all scientists studying the soybean a better and more complete basis for their work.

From experiments last summer, the Universityof Missouri team obtained the general pattern of nitrate reduction and fixation over the season. This winter, the scientists are running growth chamber and greenhouse experiments in which they completely control the environment, enabling them to account for all of the nitrogen metabolized by soybeans.

They are using a stable isotope of nitrogen to trace the pathway of soil nitrates and atmosphjeric nitrogen through the plant in order to calculate more precisely the relative importance of reduction and fixation in the nodules.

Information gained will help answer the soybean nitrogen mystery and assure higher yields in the future.

Kublai Khan

Kublai Khan was the Mongol ruler of 13th century China A devout Buddhist, Kublai completed his father's conquest of China, adding Korea and Burma to the reign The tolerant ruler was highly appreciative of learning and the arts

Erie Canal

Lake Erie's waters rushed through the Erie Canal for the first time on October 26, 1825 The Canal provided a vital link between the lake and the Hudson River at Troy Four feet deep, 28½ feet wide the canal was built by the state of New York Governor De Witt Clinton spearheading the effort

Quarantine Birds After Farm Show

By Jay W. Irwin
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Poultry exhibited at the Farm Show are exposed to many diseases not common to their flock of origin. These show birds should be kept separate from the main flock after the show for at least 30 days.

Most infections contracted by poultry at shows will break before the 30-day isolation period is up. If there are no breaks, then it is probably safe to place these birds back with the flock. In the event that disease strikes, they should not be put back with the flock. Recovered birds remain carriers and shedders of certain diseases.

Many disease breaks can be averted by establishing a sound vaccination program. However, there is no reliable vaccine available for some of the bacterial diseases for which the recovered birds remain carriers. Examples of these are coryza and fowl cholera. Be on guard for coccidiosis, too, because the show birds may have no immunity to certain species. Look for a coccidiosis break 1 to 3 weeks after bringing the birds home.