The Power and Problems of Phosphorus

Most people probably don’t think about phosphorus very much during their day. Or at all. But in the next few decades, phosphorus will be on everyone’s mind. This chemical element (with the symbol P) is essential for all life as it is part of many biological molecules. P thus plays a vital role in agriculture, supporting the growth of healthy, productive crops. Unfortunately, the world is running out of P resources.

Estimates vary, but some scientists put minable phosphorus supplies at providing enough for only 30–40 more years.

9 countries control 90 percent of the world’s known phosphorus reserves.


Crops in the Southern Great Plains do not use about 22% of the phosphorus fertilizer they receive. The highest losses were from corn and cotton.

Source: 2006 Natural Resources Conversation Service report.

Phosphorus is an element essential to both plants and animals. It is one of three nutrients commonly applied to soil as fertilizer to help plants grow. It plays roles in RNA and DNA, the cell membrane, and energy transfer reactions.

Phosphorus is not available in nature on its own, but is found in sedimentary and magmatic deposits, mostly as mineral rock phosphate.

Noble principal investigators Wolf Scheible, Ph.D., is exploring the molecular basis of how plants can more efficiently use phosphorus.

Unabsorbed phosphorus remains in the soil, where it becomes either tightly bound or is used by microbes, or, through eluviation and erosion, it enters rivers, lakes and seas.

Noble principal investigators Michael Udvardi, Ph.D., and Kiran Mysore, Ph.D., are studying the genes that allow legumes, like clovers and soybean, to efficiently acquire nitrogen and phosphorus.