Removing Phosphorus from the Farm

With new rules regulating the application of manure based on phosphorus, many producers may experience the need to remove excess phosphorus from the farm due to restrictions on land capable of utilizing the phosphorus. Separation of manure solids and liquids provides an advantage to the producer by resulting in a product that is relatively low in moisture level and can be transported from the farm without hauling an excessive amount of water. Liquids can then be land applied for crop nutrient supplementation. Composting solids will produce a more stable and possibly, marketable, product. Proper composting will kill pathogens and weed seeds in the manure and may be a more desirable product for individuals wishing to utilize manure from your dairy farm.

How do I know if I have excess phosphorus?

For a typical dairy cow operation, a general rule of thumb is that you will need 2-3 acres of land for every mature dairy cow on the farm. This land needs to be suitable for receiving manure, which means it cannot have steep slopes (slopes greater than 10%) and cannot be excessively high in soil phosphorus.

A more comprehensive way to determine if you have excess phosphorus on your farm is to complete a whole-farm nutrient balance. This involves determining all of the sources of phosphorus entering the farm (feed, animals, fertilizer, etc.) as well as all of the sources of phosphorus leaving the farm (culled animals, animal products, harvested and sold crops, manure, etc.). The difference between the phosphorus entering the farm and the phosphorus leaving the farm should balance. If there is more phosphorus entering the farm than there is leaving, then there is, or eventually will be, excess phosphorus on the farm. See Dairying and the Environment guide sheet “Performing a Nutrient Balance” for more information on completing this task.

I have excess phosphorus. Now what?

If you find that soil phosphorus levels are high or that you are importing more phosphorus than you export from the farm, several adjustments can be considered. Rations may need to be adjusted to reduce phosphorus excretions. Contact the Commercial Agriculture Dairy Nutritionist for assistance in balancing your rations. Crop rotations should be examined to determine if the current cropping system is maximizing phosphorus utilization. You may contact the Commercial Agriculture Agronomist for assistance. Once the rations and cropping rotations have been examined, and feasible changes have been implemented, methods of exporting phosphorus from the farm may need to be examined. One method of removing phosphorus from the farm is to haul manure to surrounding cropland (outside the farm boundary). This usually involves entering into a “spreading agreement” with neighbors to apply manure nutrients to their land. Most often, there is no payment to you from the recipient of the manure. Your compensation is having somewhere to utilize excess manure nutrients! Keep in mind that proper manure handling and application techniques should be utilized when applying manure to land outside the farm boundary. If available land for nutrient utilization is several miles away, it may be more economical to separate manure solids from the total manure stream and haul solids separate from liquids. Less expense is involved if excess water is not being hauled with the solids and travel farther from the farm becomes more economical.

How do I know when my phosphorus is in balance on the farm?

You should be able to “balance” your incoming and outgoing phosphorus for the entire farm once you understand the sources of phosphorus and utilization of the nutrient. A worksheet titled “Performing a Whole-Farm Nutrient Balance” is also available from the Commercial Agriculture Program.