



**PENNSYLVANIA MASTER
CORN GROWERS
ASSOCIATION**

Between The Rows

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**CROP ROTATIONS
THAT WORK**

Crop rotation is a topic that we've all heard about before but probably don't take serious enough.

We've all heard that crop rotations can reduce fertilizer costs, help control weeds and insects, and give a yield kick to crops like corn and soybeans. But, do they work in our modern crop production programs?

During the last five years, I've been continually reminded of the importance of crop rotations by corn growers around the state who are using systematic systems of crop rotation. These folks are cleverly

exploiting rotations to reduce input costs, improve their timeliness, reduce labor requirements, and to set themselves up for no-till crop production.

In this column, I'd like to review some of the successful crop rotations I've encountered during the past few years.

A few years back, I attended the Top Farmer Workshop conducted by the Farm Management Faculty at Purdue. A considerable portion of the program was devoted to figuring out the optimum machinery mix, the best tillage system and the best crop rotation for individual participants.

I attended the conference

with Rich Burd, who was a 900-acre mostly continuous corn grower. When we ran his farm through the production model, the system kept suggesting a 50:50 corn/soybean rotation. Since then, he has gradually converted to that rotation and has been very pleased with the results. Now he finds he can get most of his crop planted on time and he avoids some of the late planting yield penalties he had when he was fighting to get all that corn planted by the end of May. He needs less storage capacity, uses less N fertilizer, uses no insecticide, and all of his corn is no-tilled into soybean stubble. When it gets dry in July, having half his acreage

in beans lets him sleep a little easier at night. Changing to a systematic crop rotation on this farm has had a major impact.

On dairy farms, I've seen systematic crop rotations work just as well. I've seen several folks using three-year corn/alfalfa rotations with really good success. This rotation also helps to reduce input costs. One big advantage is that they reduce the amount third, fourth, and fifth year corn in rotation. These are the corn fields that have the heavy rootworm levels, the perennial or triazine resistant weeds, the soil compaction and the generally lower yields. By eliminating these, we can help to increase corn yields and reduce the cost of production.

We also help to avoid lower yielding fourth and fifth year alfalfa and the extra fertility costs that are some times necessary to topdress those fields with P and K. This system works especially well with no-till — spring seeding the alfalfa into third year corn stubble

harvested for silage and no-tilling the first year corn into fall killed sods. It also is best adapted in southern Pennsylvania where alfalfa yields are relatively high in the establishment year.

The downsides are the need to reseed alfalfa more often and to discipline yourself to kill some relatively good looking three-year-old alfalfa stands.

In some areas with less productive soils, longer hay rotations seem to be favored by many growers. Some producers, such as Fred McGillvray, a Cumberland County farmer who spoke recently at the Pennsylvania Crop Conference, have found effective corn rotations in these areas. Fred uses a five-year alfalfa rotation followed by corn, rye grain, corn, soybeans and corn silage and then rotates back to alfalfa.

In Fred's rotation, all of his corn follows a rotational crop, giving him a yield benefit and eliminating his need for insecticides and some fertilizer. His cropping system is diversified enough to give him some insurance in the dry years that occur frequently in his area and to provide options for manure hauling when the ground is dry.

Crops such as soybeans and rye are more drought tolerant than corn and provide some return in dry years when the corn suffers. His rotation and attention to details have also helped him to eliminate tillage for the past 15 years.

In some areas, particularly those with good, deep, level soils, continuous corn has continued to yield well. My biggest concerns with continuous corn arise with continuous corn silage. On some soils, there seems to be a potential for silage yields to decline with time.

I've encountered several silage producers who have gone to continuous no-till corn-rye and seem to be able to maintain corn production at reasonable levels while protecting the soil, conserving nutrients, minimizing potential runoff problems and sometimes producing a rye silage crop. The rye and no-till features of this rotation help to reduce the decline in soil organic matter that can occur. The downside is that rye can get out of hand in the spring and cause planting and allelopathy problems. Because of this, I favor killing the rye relatively early in the spring or harvesting it for rye silage, especially in areas where this can be done without causing planting date delays. A mixture of oats and rye or wheat and rye can help to reduce this early season flush of growth from straight rye seedings.

Another important management consideration in this rotation is that you have to be able to stay off these fields when they are wet or you'll cause compaction problems that will necessitate a tillage operation and reduce the effectiveness of this rotation. Well designed rotations are working for growers around the state. For the most part they stick to their systematic plan but are flexible if market conditions dictate.

Many of the serious crop production problems we try to address with quick and often expensive solutions can frequently be solved with a good crop rotation. If you're not satisfied with your present system, sit down and do a thorough analysis of an alternative rotation system. Be sure to consider the timeliness, reduced inputs and higher yields you can achieve with crop rotations. You may be surprised.

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