



**Q:** Because of economic considerations I'm considering planting soybeans in the same field for two or three years. What are the consequences of continuous soybeans and will I lose yield?

**A:** I'm afraid you are not the only producer considering planting soybeans in fields where soybeans were planted last year. Unfortunately this is an example of where economics collides with good agronomics. Missouri farmers plant over 5 million acres of soybeans and less than 3 million acres of corn. The Missouri wheat crop is now less than 1 million acres. Clearly, two and three years of continuous soybean is not a new phenomenon. However, present economic realities may increase the use of this cropping system.

You are right to be concerned about short-term and long-term consequences of continuous soybeans. Some of these consequences are difficult to predict, but clearly continuous soybeans is risky. As with any risk you may not see problems right away, but the longer you engage in the activity the greater the probability of harm.

Two of the most common consequences (but not the only ones) from continuous soybeans are increased soil erosion and increased pest pressure. Soybean plants produce small amounts of residue. An average soybean crop produces only 1000 pounds/acre of residue, whereas an average corn crop produces more 6000 pounds/acre. Soybean residue has high nitrogen content so it degrades quickly with time. Continuous soybeans can increase erosion unless other soil conservation measures are used. Soil organic matter and soil structure may decrease with long-term continuous soybeans. The use of winter cover crops and no-tillage may be helpful in maintaining soil quality.

Rotation is a common recommendation for many pest management plans. Several disease organisms, e.g. soybean cyst nematode, only infect soybeans. The more time soybeans occupy a field the greater the increase in pest populations. Weed control can also be more difficult in continuous soybean. It is more difficult to rotate chemicals with different modes of action in continuous soybeans. Pest management professionals rate both continuous cropping and the use of a single mode of action as high risk factors in the development of weed resistance to herbicides. With the increasing popularity of roundup tolerant soybean varieties the chance of using only 1 mode of action increases with continuous soybean.

Several recent studies have compared yields from continuous soybeans to soybeans following corn. In a Wisconsin study continuous soybeans yielded 18% (averaged over 3 years at 9 locations) less than soybeans in rotation with corn. Since 1991, I have conducted a study comparing continuous soybeans to a corn-soybean rotation in central Missouri. We found the yield advantage of rotated soybeans to vary from 5% to nearly 15%, depending on the year. The year effect was not easy to explain and was only partially related to summer weather patterns.

In many ways the effect of rotation on boosting crop yield is a mystery. Some disease and nutrient factors are clearly involved, but they do not explain the whole story. Other soil properties such as soil tilth, structure, and microbes are also involved. I cannot

recommend continuous soybeans, but understand why you are considering it. When you compare the economics of continuous soybeans to a soybean-corn rotation use a 5 to 8% yield loss from continuous soybean. You may not experience that much yield loss every year, but some decrease in yield is a near certainty. If you plant soybeans in a field in which soybeans were planted last year, you should consider using several herbicides that differ for mode of action and a seed treatment. When you consider a yield decrease along with adding several practices that may increase your input costs, crop rotation may appear to be the better option.