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The economics of corn on corn

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The economics of corn on corn

Abstract

This article discusses some of the important factors to consider when contemplating corn on corn. Only the factors that apply to the individual producer will be discussed. There are a number of environmental and societal costs and benefits that are important; however, space does not permit going into that discussion here. The biggest factor in comparing the different rotations is the yield differences. Research has shown that there is a yield drag of approximately 5 to 15 percent for second-year corn relative to first-year corn. This yield difference varies by soil and location. The yield penalty is most prevalent in bad weather years.

Keywords

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Economics

The economics of corn on corn

by Michael Duffy and David Correll, Department of Economics

This article discusses some of the important factors to consider when contemplating corn on corn. Only the factors that apply to the individual producer will be discussed. There are a number of environmental and societal costs and benefits that are important; however, space does not permit going into that discussion here.

The biggest factor in comparing the different rotations is the yield differences. Research has shown that there is a yield drag of approximately 5 to 15 percent for second-year corn relative to first-year corn. This yield difference varies by soil and location. The yield penalty is most prevalent in bad weather years.

There is some discussion that the new hybrids have removed the yield differences. Part of the reason for this might be the relatively good weather we have experienced in some parts of the state. In addition, it is important to note that the greatest yield reductions are primarily between first- and second-year corn. The yield response continues to trend downward after the second year and eventually stabilizes after the third or fourth year. Yields of corn following corn for several years never achieve those of corn following soybean. It could be that people are comparing the third- or fourth-year corn rather than the first- and second-year corn.

Another yield consideration is the soybean yield. Soybeans will yield 5 to 8 percent higher when they follow two or more years of corn as opposed to just one year.

The overall corn to soybean yield ratio for an individual field also is important when comparing rotations. The average statewide corn to soybean yield ratio has been about 3.4:1 over the past decade; however, this will change due to individual circumstances and fields.

There are also cost differences to consider. Corn requires commercial nitrogen. In addition, rootworms must be managed in situations with more than one year of corn. Depending on your situation, there may be weed management and tillage considerations as well.

Finally, corn generally will require drying. There is also a need for additional storage due to more bushels being harvested.

We have examined many of the other factors that would influence the decision regarding the optimum rotation. Nitrogen prices, relative corn and soybean prices, level of nitrogen used, and so forth will impact the breakeven price when comparing rotations. But, the yield difference is the single biggest factor in determining the optimum rotation.

The price for land does not affect the breakeven corn price between the rotations. However, the price of land has a direct bearing on the profitability of any rotation.

Iowa State has developed a spreadsheet to help farmers analyze the decision regarding which is the most profitable rotation to follow. This spreadsheet can be found on the Agricultural Decision Maker Web site at www.extension.iastate.edu/agdm. You should go under crop cost and returns and then under profitability. There are two similar spreadsheets. One lets the grower enter the level of nitrogen used and the other uses the level of nitrogen that would be optimum as determined by the Maximum Return to Nitrogen calculator. Under average conditions, with \$6.50 soybeans, a CCSb rotation is most profitable at approximately \$3.50, while a CC rotation is most profitable at approximately \$3.80.



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