Land Stewardship Project Fact Sheet #28

The Cropping Systems Calculator

Updated: August 2016

This tool can help answer a key question: How much will diversifying my farm's rotation cost?

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Chippewa 10% Project

The Chippewa 10% Project is an innovative partnership that works directly with farmers and landowners to encourage continuous living cover in the Chippewa River watershed in western Minnesota as a way to lower water pollution levels. The partnership does this by helping these farmers and landowners adopt practices that achieve their conservation goals, build soil health and increase farm diversity and profitability.

Cropping Systems Calculator

One tool developed by the Chippewa 10% Project to help farmers and other landowners calculate the costs and returns associated with getting more continuous living cover on the land is the Cropping Systems Calculator. There are many crop budget tools available, but most require that you know the costs associated with the practices. The Land Stewardship Project (LSP) set out to create a tool that is easy to use and will give estimates of possible returns with various cropping systems using default figures while giving the option to fully customize it to your farm.

The Cropping Systems Calculator is Excel-based and allows the comparison of two crop rotations, each up to six years in length. The calculator provides average returns over the rotation as well as a year-by-year breakdown for each crop within the rotations. It takes into account the crop-specific costs as well as the overhead expenses of the entire farm operation, which align with referenced schedule F tax form line items. Many common crops have default figures provided by the Cropping Systems Calculator in order to make

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Cropping Systems Calculator: Continuous Living Cover

Number of Acres of Whole Farm	500
Number of Acres to Change	40

Years in Rotation	Original	2
	New	6

Here are examples of calculations that can be carried out by the Calculator.

	Original Crop Plan		
	Crop 1	Crop 2	Crop 3
Year 1	Corn		
Year 2	Soy		

	New Crop Plan		
	Crop 1	Crop 2	Crop 3
Year 1	Corn	LateSeasonCover	
Year 2	Soy		
Year 3	SpringWheat	Alfalfa	
Year 4	Alfalfa		
Year 5	Alfalfa		
Year 6	Alfalfa	Grazing	

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Average Yearly Costs and Returns from the Two Rotations

Returns are seen as wages for the farm owner in this tool and aren't factored into labor costs.

Total Overhead Expenses	Per Acre	Whole Farm
	$ 115.08	$57,541.21

	Original Crop		New Crop		Percent Difference
	Per Acre	*Total*	*Per Acre*	*Total*	
Total Crop Expenses	$410.14	$16,405.40	$491.35	$19,654.15	20%
Total Crop Income	$482.13	$19,285.07	$810.66	$32,426.28	68%
Other Income	$77.49	$3,099.71	$31.95	$1,277.98	-59%
Returns to Management	**$34.40**	$1,376.08	**$236.17**	$9,446.82	587%

-Percent difference shows the percent increase in the new crop when compared to the old crop

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it easier to use without knowing the costs associated with a farmer's specific operation. These figures are gathered from the University of Minnesota's farm financial and production benchmark database (otherwise known as FINBIN) for a 10-county area, which covers the Chippewa River watershed region. These defaults can be easily changed by the users to more accurately reflect the realities of their own enterprises, thus allowing them to customize the Calculator to their situation.

A unique feature of the Cropping Systems Calculator is that it allows a comparison of various grazing systems on a per-acre basis. Based off the Grass Fed Beef Calculator from the Pasture Project (an initiative of the Wallace Center at Winrock international), it allows a producer to compare types of cattle (cow/calf, stocker, feeder to finish, custom grazing) as well as management style (continuous, basic rotational, managed intensive rotational, mob grazing).

The Cropping Systems Calculator is not expected to provide an exact amount of income a farmer can rely on earning the following season, but rather a good estimate of the range of returns possible. This is just one of many tools that can be used to help make informed decisions while exploring options for a farm.

What We've Learned So Far

• Marginal Fields & Prime Crop Ground
Through the modeling work of the Chippewa 10% Project, LSP has predicted that the largest improvements in water quality come when shifting practices in marginal corn/soybean fields while also increasing income across the region. Originally the Calculator was aimed solely at reassessing practices on these marginal fields (too wet, too dry, too hilly, low fertility) that historically have poor row crop yields. The current run of low corn and soybean prices is causing many farmers to look closely at fields that may actually have high yielding soil and wonder if another enterprise may be more lucrative. Managed intensive rotational and mob grazing are two of the alternatives livestock producers are considering because of the higher returns that are possible when a pasture is well managed and can support more animals.

• Government Program Influences
When testing various scenarios in the Cropping Systems Calculator, it's impossible not to acknowledge the impact of federal crop insurance and other government subsidy programs that support commodity crops. For example, using figures from the FINBIN database for 2014 from the 10-county area in west-central Minnesota, the average reported crop insurance payment was $123.31 per acre for corn. This payment helped corn growers avoid losing money and promoted the continued planting of the crop to the exclusion of others. The Calculator shows that even though diversifying a rotation may make sense from a pure market perspective, crop insurance skews the system, playing a big role in the dominance of corn and soybeans throughout the Midwest and beyond.

• A Second Look at Diversity
Many farmers would like to add more cover to their land or extend their rotation past the typical corn-soybean duo-culture, but struggle with making such planting decisions financially viable. Indeed, some farmers who plugged options such as cover cropping or pasture into the Calculator found that initial results did not provide the profits they desired. But through relatively minor tweaks, they were able to make more continuous living cover pay while improving soil health and protecting water quality. For example, grazing a cover crop or moving towards a higher livestock stocking density on pasture provided a boost in income levels. Many times these changes in management style made the new practice as profitable, if not more profitable, as the original commodity crop.

That's exactly the goal of the Calculator: giving farmers a way to make informed management decisions that aren't simply based on "doing it the way we've always done it," and giving them a way to be creative in finding ways to design alternative practices.

Give the Calculator a Try

The Cropping Systems Calculator is available at http://landstewardshipproject.org/chippewa10croppingsystemscalculator. Take a look and give it a test drive. Feedback or questions can be directed to LSP's Rebecca Wasserman-Olin at 612-722-6377 or csc@landstewardshipproject.org.

This fact sheet is brought to you by the members and staff of the Land Stewardship Project, a nonprofit organization devoted to fostering an ethic of stewardship for farmland and to seeing more successful farmers on the land raising crops and livestock. For more information, call 612-722-6377 (Minneapolis), 320-269-2105 (Montevideo) or 507-523-3366 (Lewiston); or visit www.landstewardshipproject.org.