

Cash Rents and Net Returns for Different Corn Price and Yield Scenarios

Nicholas Bannon, Alfons Weersink and B. James Deaton
Department of Food, Agriculture and Resource Economics
University of Guelph

Harvest season is almost upon Ontario farmers. During the long days spent in the combine getting the current crop off, there will be time to contemplate next year's crop including the amount to pay for rented land. What is an optimal rental price going into 2021, and what factors should farmers, particularly those growing corn, consider when they are making their bids?

In theory, the most a farmer would be willing to pay for rent, is revenues less non-land variable costs. Price and yields will determine the total amount of revenue that can be used to pay for non-land expenses such as fuel, labour, or fertilizer. Once all non-land costs are accounted for, the remaining amount can be used to pay for rent. This remaining amount is the break-even rental price.

Based on the 2020 edition of [OMAFRA's Publication 60](#), which estimates the expenses associated with a variety of field crops, the non-land variable costs for growing corn is \$646.05 per acre. Publication 60 is a management tool to help farmers determine their own individual operating and overhead expenses, and its cost estimates are not an average nor the value for a typical farmer. The estimate is a starting point for farmers assessing their own individual costs and we will use it in the same manner here. Non-land costs are assumed to be \$646 per acre so that we can focus on the influence of price and yield on rental bid rates.

New crop prices for corn to be harvested this fall are currently around \$4.60/bu and forward contract prices for 2021 corn are now close to the same value at \$4.70/bu. Actual prices to be received by an individual farmer for next year's crop will depend on a number of factors including trade issues, exchange rates, and weather. For our analysis, we assume a range of prices from a low of \$3.50/bu to a high of \$6.50/bu.

The price of corn can vary somewhat regionally depending on the local basis, but yields can dramatically vary by location due to soil quality and heat units. According to [annual field crop yield data](#) collected by OMAFRA, between 2015 and 2020, the average yield for Ontario grain corn was 165bu/acre. Average corn yields for counties in Central and Eastern Ontario were in the 130bu/acre range while averages for counties in Southwestern Ontario were over 180 bu/acre. These are county averages and individual farm yields will vary significantly around those averages. For our analysis, we assume corn yields of 135 bu/acre, 165 bu/acre, and 200 bu/acre.

The amount that a farmer pays in rent should be positively correlated with the expected returns that can be generated off the land. The most expensive land should be the land which generates the highest yields, and therefore the most revenue. This assumption generally holds true when looking at the [2019 Farmland Value and Rental Value Survey](#). Ontario counties with typical rental rates on the lower end at \$100/acre include counties such as Dufferin, Durham, and Grey counties, three counties that have relatively lower corn yields in the 130bu/acre range. Counties with typical rental rates of \$200/acre include those such as Brant, Bruce, and Elgin counties. Counties with rental rates of \$300/acre and hence the most productive land include Huron, Oxford, and Perth counties.

Net returns to farmers under various corn price, yield returns and rental rates after subtracting variable costs of \$646/acre are presented in Table 1. There are price and yield scenarios in Table 1 that are unlikely to be observed in the real world, such as cash rent of \$100/acre on land generating corn yields of 200 bu/acre, but the scenarios highlight a number of factors to consider when determining how much to bid for rented land.

One is the large number scenarios in red in Table 1 where the net returns are negative for the assumed cash rental rates. In a time of low commodity prices (\$3.50/bu), it is difficult to know if any corn farmers, regardless of rental rate, will be able to generate enough revenue to have a positive net return on their rented land. Corn prices need to move into the \$5.50/bu range and beyond for tenants to have a realistic opportunity of generating a positive net return, and even then, it is no guarantee. Under current projected 2021 corn prices of \$4.50/bu, the break-even rent per acre would be \$254 for yields of 200 bu/acre and \$96.45 with yields of 165 bu/acre. The farmer would lose money with \$4.50 and yields of 130 bu/acre even if the land was free.

Our approach emphasizes the relationship between net-returns and varying levels of rent, yield, and price. In Table 1, we do not vary the production cost per acre, they remain fixed at \$646/acre. Given the magnitude of these production costs, they are deserving of careful attention, alongside price and yield estimates when it is time to place bids for land rentals in 2021.

Table 1. Net Returns to Tenant for Corn under Alternative Corn Price and Yield Conditions and Cash Rental Rates

Price (\$/bu)	Yield (bu/acre)	Net>Returns Under Varying Cash Rental Rate Scenarios (\$/acre)			Break- Even (\$/acre)
		100	200	300	
3.5	130	-291	-391	-491	x
	165	-168.5	-268.5	-368.5	x
	200	-46	-146	-246	x
4.5	130	-161	-261	-361	x
	165	-3.5	-103.5	-203.5	x
	200	154	54	-46	254
5.5	130	-31	-131	-231	x
	165	161.5	61.5	-38.5	261.5
	200	354	254	154	454
6.5	130	99	-1	-101	199
	165	326.5	226.5	126.5	426.5
	200	554	454	354	654

Red – net returns to tenant are negative

Green – net returns to tenant are positive