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Department of Agricultural and Consumer Economics, University of Illinois Urbana-Champaign

International Benchmarks for Corn Production

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June 1, 2018

***farmdoc daily* (8):100**

Recommended citation format: Purdy, R. and M. Langemeier. "International Benchmarks for Corn Production." *farmdoc daily* (8):100, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, June 1, 2018.

Permalink: http://farmdocdaily.illinois.edu/2018/06/international-benchmarks-for-corn-production.html

Examining the competitiveness of corn production in different regions of the world is often difficult due to lack of comparable data and agreement regarding what needs to be measured. To be useful, international data needs to be expressed in common production units and converted to a common currency. Also, production and cost measures need to be consistently defined across production regions or farms.

This paper examines the competitiveness of corn production for important international corn regions using 2013 to 2016 data from the *agri benchmark* network. Previous *farmdoc daily* articles (November 6, 2015 and September 2, 2016) examined international benchmarks for corn using data from 2012 to 2014, and 2013 to 2015.

The *agri benchmark* network collects data on beef, cash crops, dairy, pigs and poultry, horticulture, and organic products. There are 38 countries represented in the cash crop network. The *agri benchmark* concept of typical farms was developed to understand and compare current farm production systems around the world. Participant countries follow a standard procedure to create typical farms that are representative of national farm output shares and categorized by production system or combination of enterprises and structural features.

Data from seven typical farms with corn enterprise data from Argentina, Brazil, Russia, Ukraine, and United States were used in this paper. It is important to note that corn enterprise data is collected from other countries. For more information, visit the *agri benchmark* website (here). These five countries were selected to simplify the illustration of costs and discussion.

The farm and country abbreviations used in this paper are listed in table 1. While the farms may produce a variety of crops, this paper only considers corn production. Typical farms used in the *agri benchmark* network are defined using country initials and hectares on the farm. There are seven U.S. farms with corn in the network. The two Indiana farms used to illustrate corn production in this paper are the west central Indiana (US1215INC) typical farm and the southern Indiana (US1215INS) typical farm. An Iowa typical farm (US700) was also included in the analysis.

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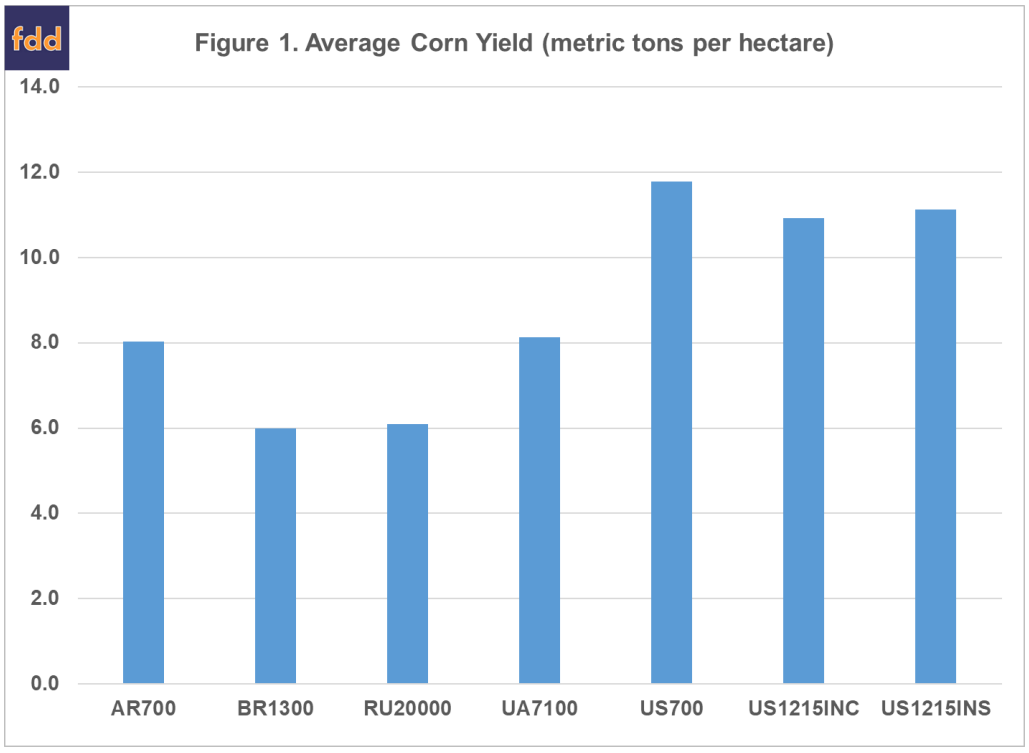
Table 1. Abbreviations of Typical Farms

Farm	Country	Hectares	Region
AR700	Argentina	700	Southeast of Buenos Aires
BR1300	Brazil	1300	Mato Grosso
RU20000	Russia	20000	Chernozem/Black Soil Region
UA7100	Ukraine	7100	Poltava region, Central part of Ukraine
US700	United States (Iowa)	700	Iowa
US1215INC	United States (west central Indiana)	1215	Central Indiana
US1215INS	United States (southern Indiana)	1215	Southern Indiana

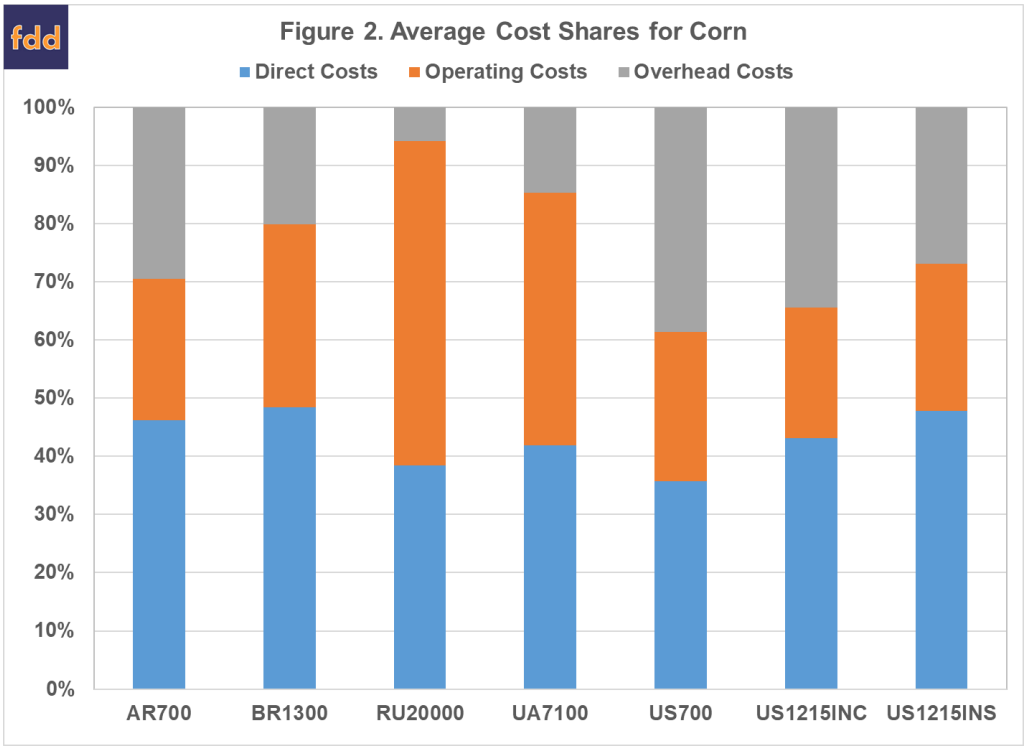
Corn Yields

Although yield is only a partial gauge of performance, it reflects the available production technology across farms. Average corn yield for the farms in 2013 to 2016 was 141.2 bushels per acre (8.9 metric tons per hectare). Average farm yields ranged from approximately 95.6 bushels per acre for the Brazilian farm (6.0 metric tons per hectare) to 187.7 bushels per acre for the Iowa farm (11.8 metric tons per hectare). Figure 1 illustrates average corn yield for each typical farm. All of the U.S. farms had average corn yields above 170.0 bushels per acre (10.7 metric tons per hectare). The range of yields, for U.S. farms, was within 13.8 bushels per acre (0.9 metric tons per hectare). It is important to note that corn is the second crop of the year for the typical farms in Argentina and Brazil.



Input Cost Shares

Due to differences in technology adoption, input prices, fertility levels, efficiency of farm operators, trade policy restrictions, exchange rate effects, and labor and capital market constraints, input use varies across corn farms. Figure 2 presents the average input cost shares for each farm. Cost shares were broken down into three major categories: direct costs, operating costs, and overhead costs. Direct costs included seed, fertilizer, crop protection, crop insurance, and interest on these cost items. Operating cost included labor, machinery depreciation and interest, fuel, and repairs. Overhead cost included land, building depreciation and interest, property taxes, general insurance, and miscellaneous cost. Cash costs and opportunity costs were included in the cost categories.



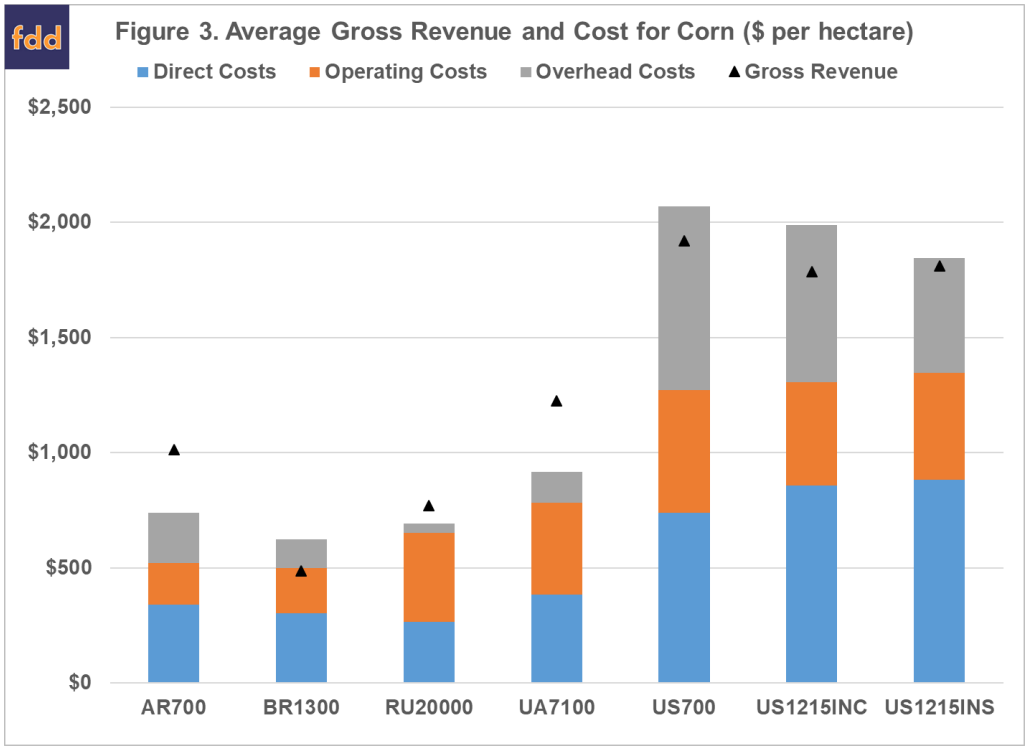
The average input cost shares were 43.1 percent for direct cost, 32.6 percent for operating cost, and 24.3 percent for overhead cost. The typical farms from Russia and Iowa had below average cost shares for direct cost, and the typical farms from Argentina, Brazil, and southern Indiana had the highest average direct cost shares. The typical farms from Argentina and the United States had below average cost shares for operating cost. The typical Russian farm and Ukraine farm had above average operating cost shares. The typical farms from Russia and Ukraine had below average cost shares for overhead cost. The west central Indiana farm and the Iowa farm had the highest overhead cost shares. The relatively large cost share for overhead cost in the U.S. reflects relatively high land costs.

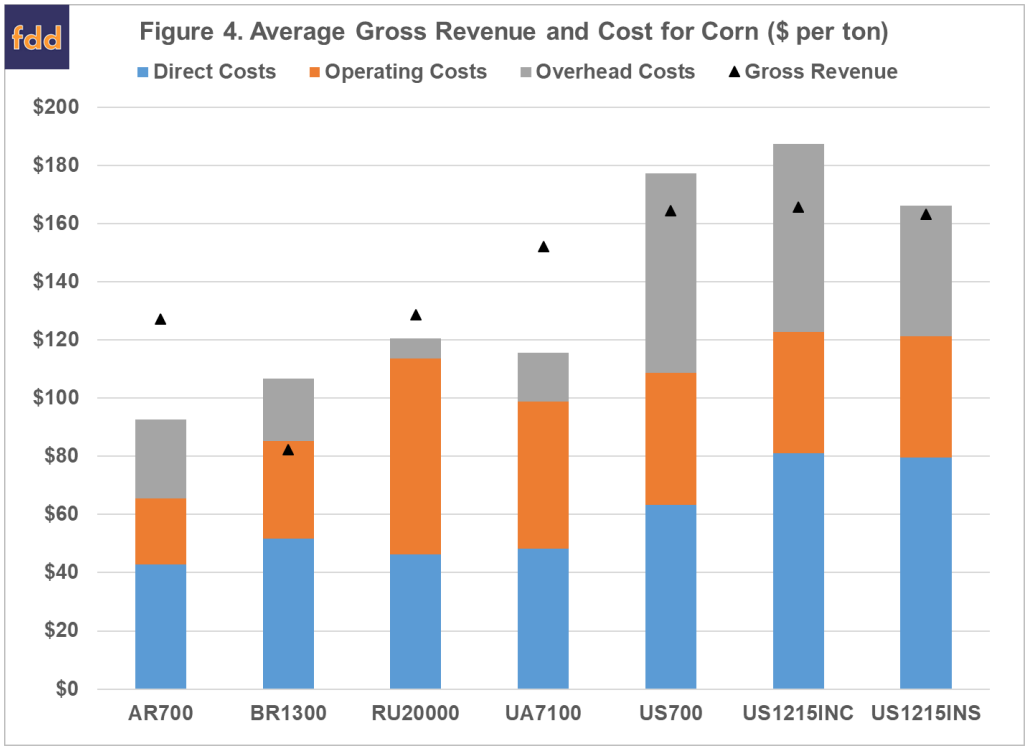
Revenue and Cost

Figures 3 and 4 present average gross revenue and cost per hectare and per ton for each typical farm. Gross revenue and cost are reported in U.S. dollars for each typical farm. It is obvious from figures 3 and 4 that gross revenue was substantially higher for the farms in the United States. However, cost is also substantially higher for these farms. The typical farms from Argentina, Russia, and Ukraine exhibited economic profits during the four-year period. Average losses for the typical farms from Brazil, Iowa, west central Indiana, and southern Indiana were $56, $61, $82, and $13 per acre, respectively, during the four-year period ($138, $151, $202, $32 per hectare, respectively). The year with the lowest economic profit for each farm was 2013 for the typical farm from Brazil, 2014 for the typical farms from southern Indiana, Russia and Ukraine, 2015 for the typical farms from west central Indiana and Argentina, and 2016 for the typical farm from Iowa.

Conclusions

This paper examined yield, gross revenue, and cost for farms in the *agri benchmark* network from Argentina, Brazil, Russia, Ukraine, and the United States with corn enterprise data. Yield, gross revenue, and cost were substantially higher for the U.S. farms. The typical farms in Argentina, Russia, and the Ukraine exhibited a positive average economic profit during the 2013 to 2016 period.





References

agri benchmark. http://www.agribenchmark.org/home.html. Retrieved on May 29, 2018.

Langemeier, M. "International Benchmarks for Corn Production." *farmdoc daily* (6):167, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, September 2, 2016.

Langemeier, M., and E. Lunik. "International Benchmarks for Corn Production." *farmdoc daily* (5):207, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, November 6, 2015.