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Weekly Farm Economics: Per Acre Non-land Costs of Grain Farms of Different Sizes

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December 18, 2012

farmdoc daily (2):244

Recommended citation format: Schnitkey, G. "Per Acre Non-land Costs of Grain Farms of Different Sizes ." *farmdoc daily* (2):244, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, December 18, 2012.

Permalink: <http://farmdocdaily.illinois.edu/2012/12/per-acre-non-land-costs-of-grain-farms.html>

http://farmdoc.illinois.edu/podcasts/fefo/FEFO_12_24.mp3

Considerable interest exists in examining per acre costs for grain farms of different sizes. Herein data from grain farms enrolled in Illinois Farm Business Farm Management (FBFM) are examined to determine per acre costs of farms of different size, breaking down those costs into non-land and land components. Only financial costs are included in this study, opportunity costs for unpaid labor, management, and equity are not included. Average non-land costs do not vary across farms of different size. Land costs tend to increase with farm size.

Farms Included in the Evaluation

FBFM data for the calendar year 2011 are used to quantify per acre costs. To be included in this study, farms have to meet the following criteria:

1. The farm's records have to be certified usable by FBFM field staff,
2. The farm has to be located in northern and central Illinois,
3. The farm has to receive the majority of income from grain operations,
4. The farm has to have a high-productivity farmland,
5. The farm has minimal livestock enterprises, and
6. The farm has to receive less than \$20 per acre in custom farming income.

These criteria are meant to select specific farms with only grain operations so the focus is on costs from grain farm production. There were 641 farms that meet these criteria.

Non-land Costs for Different Farm Sizes

Per acre non-land costs do not vary much across farm size categories (see Table 1). Non-land costs average \$484 per acre for farms with less than 500 tillable acre, \$481 per acre for farms between 501 and 750 acres, \$487 per acre for farms with 751 to 1000 acres, \$485 per acre for farms between 1001 and 1500 acres, \$480 per acre for farms between 1501 and 2000 acres, \$486 per acre for farms between

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2001 and 3000 acres, \$477 per acre for farms between 3001 and 4000 acres, and \$525 per acre for farms over 4000 acres.

Table 1. Per Acre Costs on Pure Grain Farms in Northern and Central Illinois Enrolled in Illinois Farm Business Farm Management, 2011¹.

	Acre Range							
	0- 500	501 - 750	751 - 1000	1001 - 1500	1501 - 2000	2001 - 3000	3001 - 4000	Over 4000
	\$ per acre							
Fertilizer	106	103	110	121	120	117	121	124
Seed	79	85	84	81	82	86	81	84
Chemical	<u>43</u>	<u>44</u>	<u>44</u>	<u>41</u>	<u>44</u>	<u>42</u>	<u>49</u>	<u>30</u>
Crop costs	228	232	238	243	246	245	251	238
Power costs ²	151	137	131	131	118	115	108	141
Other costs ³	105	112	118	111	116	126	118	146
Total non-land costs⁴	484	481	487	485	480	486	477	525
Land costs⁵	119	157	186	195	199	200	191	234
Cash rent	195	224	206	217	236	241	232	276
Percent acres:	Percent							
Owned	41%	28%	18%	16%	16%	12%	14%	15%
Share-rent	4%	11%	14%	14%	14%	17%	18%	8%
Cash-rent	55%	61%	68%	70%	70%	71%	68%	77%
Percent acres in:								
Corn	56%	59%	60%	63%	63%	66%	64%	76%
Soybeans	42%	39%	38%	35%	35%	32%	34%	22%

¹ This table only includes financial costs. Not included are opportunity charges for unpaid labor, equity capital, and management employed in the operation.

² Includes machinery depreciation, machinery hire, machinery repairs, fuel & oil, and light vehicle.

³ Includes building depreciation and repair, grain storage and drying, paid labor, crop and general insurance, and misc.

⁴ Sum of crop, power, and other costs.

⁵ Includes cash rent for cash rent farmland, equivalent cash rent costs on share rent farmland, and ownership costs on owned land (property tax and interest payments).

Note that farms in the over 4000 acre category have higher costs than farms in smaller size categories. The over 4000 acre farms have average costs of \$525 per acre compared to smaller size categories (see Table 1). Much of the difference can be explained by higher percent of acres in corn. Farms in the over 4000 acre category have 76% of their acres in corn while farm size categories between 1000 and 4000 acres are in the low-to- mid-60% range (see Table 1). Costs associated with corn acres tend to be higher than those for soybean acres, thereby accounting for the higher costs for farms with over 4000 acres.

Land Costs for Different Farm Sizes

Land costs also are shown in Table 1. Land costs include the financial cost of owning land (interest on mortgage debt and property tax), share- renting farmland (equivalent cash rent on share-rent acres) and cash-renting farmland (cash rent). Note that these costs do not include opportunity costs. This is especially important on owned land. Many farms have low debt levels on owned land and hence will have low financial land costs. For example, farms without mortgage debt will only have property tax costs on owned land, roughly \$30 per acre. Including an opportunity charge on owned land would increase the costs shown in Table 1.

Non-land costs increase as farm size increases (see Table 1). Land costs are \$119 per acre for farms

with less than 500 tillable acres, \$157 per acre for 501 to 750 acres, \$186 per acre for farms with 751 to 1000 acres, \$195 per acre for 1001 to 1500 acres, \$199 per acre for 1501 to 2000 acres, \$200 per acre for 2001 to 3000 acres, \$191 per acre for 3001 to 4000 acre, and \$234 per acre for farms with over 4000 acres.

Farms below \$1,000 acres have the lowest land costs of all farm size categories, with non-land costs below \$200 per acre. These farms have low costs because more of their farmland is owned, likely at low debt levels. Farm size categories below 1000 acres have more than 25% of their acres owned, compared to less than 20% for the larger size categories.

Farms between 1000 and 4000 acres have non-land costs between \$186 per acre and \$200 per acre (see Table 1). These farms have roughly 70% of their acres cash rented, with average cash rents ranging from \$206 per acre up to \$242 per acre.

Farms with over 4000 acres have higher non-land costs than farms with smaller farm sizes: \$234 per acre for the over 4000 acre category compared to \$200 per acre or less for the lower farm sizes (see Table 1). This occurs because a larger portion of farmland is cash-rented (77% for over 4000 acre farms compared to 71% or less for lower farm sizes) and cash rents are higher for farms with over 4000 acres (\$276 per acre for over 4000 acre farms while smaller categories average \$241 per acre or less).

Summary

Non-land costs do not tend to vary with farm size. This does not support the notion that larger farms have cost advantages over smaller farms. There still are advantages to increase farm size, as incomes will rise with larger farm sizes as long as costs can be controlled. Therefore, larger farms will have higher net farm incomes than smaller farms, as long as costs can be controlled.

Financial land costs tend to increase with farm size. This occurs because larger farms tend to cash rent more of their farmland at higher cash rents.

Acknowledgements

This data comes from Illinois Farm Business Farm Management (FBFM), a record-keeping and financial service cooperative available to farms in Illinois. Farmers in FBFM receive financial statements, tax planning and tax preparation services, cash flow planning, and advice on financial matters. More information on FBFM can be obtained from www.fbfm.org. Contact Dwight Raab at 217-333-5511 or d-raab@illinois.edu for more information.