IFCN CASH CROP: BENCHMARKING FARMS GLOBALLY OILSEED PRODUCTION COSTS

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ABSTRACT

Vegetable oil production has become one of the fastest expanding cash crop sectors in the last 50 years and it is still increasing rapidly. However the regions of expansion, the sources of plant oil and their importance vary over time. To shed light on this development it is necessary to look at the farm level production systems and their production costs for a variety of countries and oilseeds. In this paper we present the first results of the IFCN Cash Crop Network covering the international comparison of oilseed producing farms.

A total of 25 farms with oilseed production have been analysed in compiling this paper. All farms produce at least one of the following oilseeds: soybeans, oilseed rape, sunflower and (two farms) mustard. The farms are located in 14 different countries/regions and represent typical oilseed producing farms in their region/country. The farm data was collected and compiled in all countries and regions by IFCN Partners according to IFCN standards to en-sure its international comparability.

The most competitive farms in oilseed production worldwide can be found in South America. The farms in Ukraine also have great potential. At the moment the farms in Argentina show the highest profit margins. The farms from North America can also cover their full costs with the prices they receive for soybeans, sunflower and rape seed.

Keywords: Farm comparisons, Cash Crop production, International competitiveness, Inter-national Farm Comparison Network; Oilseed, Benchmarking

IFCN CASH CROP – GLOBAL COST OF PRODUCTION COMPARISON OF OILSEED PRODUCING FARMS

Introduction

In the last 40 years, plant oil production increased by 4.2% annually on average from around 20 million tons to above 100 million tons of plant oil in 2002 for all plant oil varieties (FAO-Stat, 2004). Especially the production of palm oil (7.3% p.a.), rape seed oil (6.6% p.a.), and soybean oil (5.2% p.a.) have increased over the past 40 years. During this ex-pansion of plant oils, both production locations and types of plants have changed substan-tially.

To get a better understanding of world plant oil production it is therefore necessary to ana-lyse production economics on the producer level. The analysis shall shed light onto the de-cisions of producers in connection with cash crop production. This paper aims to start this process by benchmarking production costs of oilseed producers globally. However, it has to be taken into account that this is only a first step in gaining more understanding of global plant oil and cash crop producers and crop production in the future. This paper can only present the results of the IFCN Cash Crop Network in its first year 2004.

After describing the farms analysed, the special methods applied in this paper are de-scribed. The global farm benchmarking exercise is presented to draw a picture of production cost differences for oilseeds between farms in various countries/regions. The concluding remarks are

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a summary of the IFCN Cash Crop Network and the major results of this pro-duction costs comparison.

Description of the benchmarked farms

In this farm benchmarking, 25 farms from 14 different countries/regions have been analysed. All farms produce at least one oilseed within some kind of crop rotation. The farms in the comparison are listed in Table 1. The first two letters of the names stand for the country, for example AR stands for Argentina. The number behind these two letters stands for the amount of land in production of the farm, for example 1000 stands for 1000 hectare. The last letters stand for the region where the farm is located in its country, for example BA stands for the Buenos Aires area in Argentina.

The farm sizes measured in hectares differ from around six hectares in the farms in Pakistan and India, to between 50 and 260 hectares for family farms in Europe, to large family farms in the United States with 600 to 1000 hectares, to very large farms of a 1000 or even more than 2000 hectares in Canada, South America and Eastern Europe. The comparison of such a large variety of different farms has several implications for the methods applied in this benchmarking exercise.

The crop rotation schemes vary substantially across the farms. While the Brazilian farm is very specialised with over 70 percent of its area planted with soybeans, the farms in India and Pakistan plant more than 10 different crops in addition to running some livestock operations. Overall, six farms produce soybeans, 16 farms oilseed rape, eight farms sunflowers and two mustard. Six farms produce more than one oilseed. In the following comparison we only looked at two of the four Canadian farms contributing to the network since they were very similar within this comparison (This made the graphs a little easier to read).

ble 1: List of farms in the comparison and their oilseeds

arm	Soya	Rape	Sunflower	Mustard
\R1000BA			x	
\R1800BA	x			
3R480DF	x			
CA1200SaBI		x		
CA1200SaBr [1)]		x		
CA2020SaBI [1)]		x		
CA2430SaBr		x		
CZ2200BO		x		
CZ460BO		x	x	
DE1200UM		x		
DE260OW		x		
DE900MV		x		
FR150PG		x		
FR200BG		x		
HU250GP		x	x	x
HU50GP			x	
N6HA				x
JS1010ND	x			
JS600IA	x			
JS880ND	x		x	
PL1850NW		x		
JA1730VI			x	
JA2250BT	x	x		
PK6PU		x	x	
HU1100TD		x	x	

) Not displayed in the comparison graphs.

METHODS

The IFCN methods were applied to analyse production costs according to the description in the general IFCN paper of Claus Deblitz. The farm data was collected accordingly to fit the requirements of the farm analysis and simulation model TIPI CAL in all countries and to suit this benchmarking analysis. The cost comparison is based upon the model TIPI CAL. However the particularities of cash crop farming needed some special approaches as de-scribed below.

a) The different oilseeds are compared to each other using one common unit. This unit represents a metric ton of rape seed. Therefore this unit is defined as "Metric Ton Rape Seed Equivalent" (Mt RE) (Parkhomenko, 2003). One metric ton rape seed equivalent of sunflower has, for example, the same processed value in a North Sea port as one metric ton of rape seed. Without the common unit it would not be possible to compare yields, production costs, etc. All prices for this calculation were taken as close to North Sea ports as possible as an average of the years 2000 to 2004 (Mielke, 2002-2004). The adjustment factor to derive the unit "Metric Tone of Rape Seed Equivalent (Mt RE)" for sunflower is 1.075 and for soybeans 0.930, while for rapeseed, logically, it equals one.

b) Fixed and non-direct costs have been distributed among the different farm enter-prises and crops according to their return shares. This was the only applicable method across all countries and farms.

OILSEED PRODUCTION COST BENCHMARKING

Yields

The highest yields can be found in Europe, where farms close to the Baltic Sea in Northern Europe clearly have the lead (DE900MV) with more than four Mt RE per ha. The following farms reach above three Mt RE per ha: CZ2200, DE260OW and HU1100HA. Most of the farms are between two (or very close to two) and three Mt RE. Only the farms in Canada, Pakistan and India show a yield clearly below two Mt RE per ha. In Canada the growing season is very short, and surprisingly, this is the case for the analysed oilseeds in Pakistan and India as well. Oilseeds on these farms are only a cover/break crop for the dry season with a very short growing period.

VARIABLE COSTS OF PRODUCTION

Fertiliser costs

Fertiliser costs vary a lot across all crops and farms. However, in Graph 1 it can clearly be seen that fertiliser costs for soybeans are a lot lower than for rapeseed and sunflowers, because soybeans are a legume and do not need any nitrogen fertiliser.

In Argentina we have a special situation. At the moment, typical farmers in Argentina are hardly applying any bought fertiliser to crops, which is partly due to the past financial turmoil in that country. Whether this practice will be sustainable in the future remains to be seen. In North Dakota, in the United States, soybeans are a relatively new crop. It seems that farm-ers there do not have to apply the same amounts of fertiliser as they do in Iowa. The farms in Western Europe show the highest fertiliser costs of all farms, however they also have the highest yields.

The main point is that in soybean production the fertiliser costs are a lot lower than in rapeseed and sunflower production.

Plant protection and seed costs

The costs for seeds are relatively low in Argentina, Brazil, the Czech Republic and Poland.

In India they use leftover seeds from last year's harvest. In the rest of Europe the seed costs are in the middle range, while in North America the seed costs are relatively high.

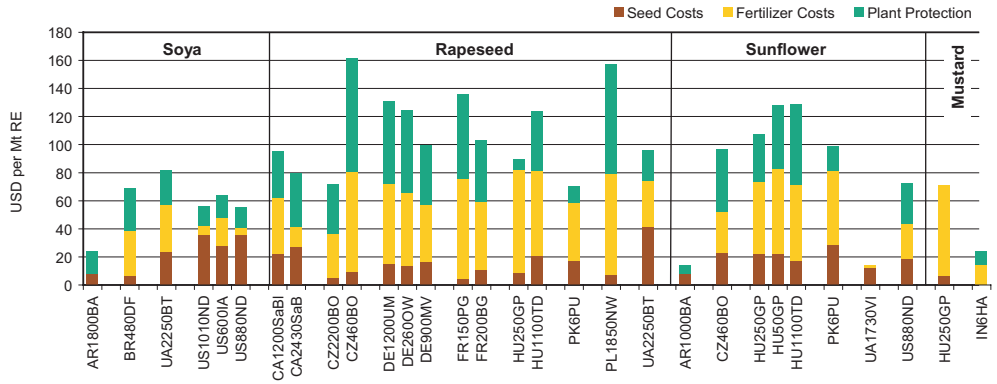
Seed costs often include costs for seed treatment or the technology fees for genetically modified crops like Round-Up Ready soybeans. For that reason, the costs of seeds in the United States are relatively high while the costs for plant protection are relatively low. The sum of these two cost centres is, however, in the middle range of all seed and plant protec-tion costs.

The situation in the area of plant protection costs is a lot different than in the area of seed costs. Some farms, like the Ukrainian farm producing sunflower seeds, do not use any plant protection. Other farms, like the 1000 hectare Argentinian farm and the 250 hectare Hungar-ian farm, use only little plant protection, however these farms have relatively low yields. In the middle range of plant protection costs are the other farm in Argentina, farms in the United States, the farm in Pakistan and India. The European farms show much higher costs of plant protection, which can be attributed to two causes. First: these farms have the high-est yields (to reach these yields they need a lot more plant protection); second: higher prices for chemicals.

Total crop maintenance costs (seed, fertiliser, plant protection)

The European farms show much higher costs for seed, fertiliser and plant protection than the rest of the world. This is mainly due to the fact that these farms show higher fertiliser and plant protection costs. The farms from North America, Brazil, Pakistan and one farm from the Ukraine, as well as the large Czech farm, are in the middle range regarding these costs. How-ever the composition varies a lot. The Indian farm, one Ukrainian farm and the farms from Argentina show very low costs for fertiliser, plant protection and seeds. Ulti-mately though, these farms probably produce in an area of the production function that is below the optimum or not sustainable in the long run.

Graph 1: Costs of Seeds, Fertilizer and Plant Protection



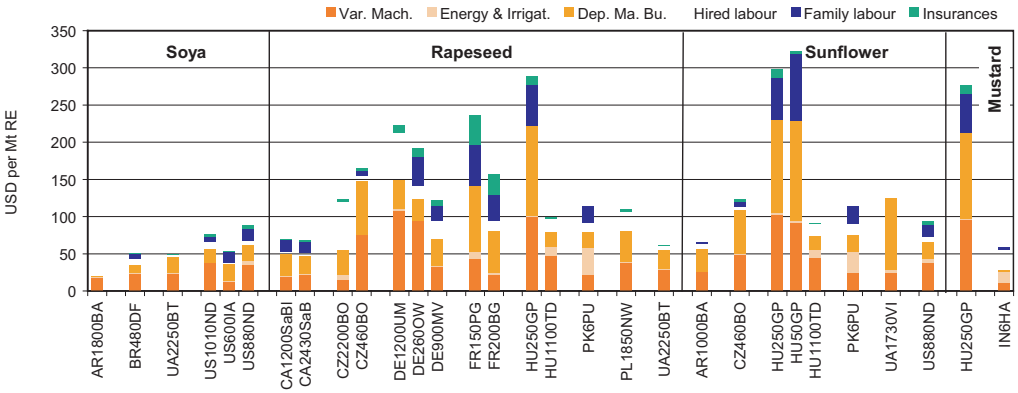
Costs of labour and machinery (operating costs)

The highest operating costs are observed in Europe, especially on the smaller farms. How-ever, farm sizes can not be the only explanation for these differences, as can be seen in the case of the German farms. The largest farm with 1200 hectares has the highest operating costs per metric ton rapeseed equivalent unit. They are even higher than on the 260 hectare farm. Man-agement capabilities, as well as labour organisational issues, play an important role here. The same reason might be true for the very high operating costs on the Hungar-ian family farms. However these farms have received subsidies in the past to buy new ma-chinery, which might be a reason for these high costs.

In general, it can be said that the farms from Eastern Europe have lower operating costs than the farms from Western Europe. There are only some exceptions to this rule, like the Hungarian family farms and the small Czech farm.

Lower operating costs than the farms in Eastern Europe can be found on the North American farms (with just above 50 US-Dollars per Mt RE) followed by one Ukrainian farm and two farms from South America. The bigger farm from Argentina has even lower operating costs of clearly below 50 US-Dollars per metric ton rapeseed equivalent. This farm owns hardly any machinery for arable farming. Nearly all the work in the fields is done by contrac-tors. Moreover this farm is applying minimum or no-till soybean production systems, there-fore the operating costs are kept down very low.

Graph 2: Operating Costs of Production



Total Costs by cost items

Graph 3 shows the total costs of the benchmarked farms and their composition. The farms in Europe and Pakistan show the highest costs of above 300 US-Dollars per metric ton rapeseed equivalent (Mt RE). The only exception is the large Czech farm of 2200 hectares. The farms in North America have production costs for sunflower, soybean and rapeseed just above 200 US-Dollars per Mt RE. The 1000-hectare farm in Argentina, and the 1730-hectare farm in the Ukraine, produce sunflower seeds for about 200 US-Dollars per Mt RE, or even less, just like the second farm in the Ukraine producing rapeseed. The soybean producing farms in Argentina, Brazil and Ukraine show production costs closer to, but above, 100 US-Dollars per MT RE.

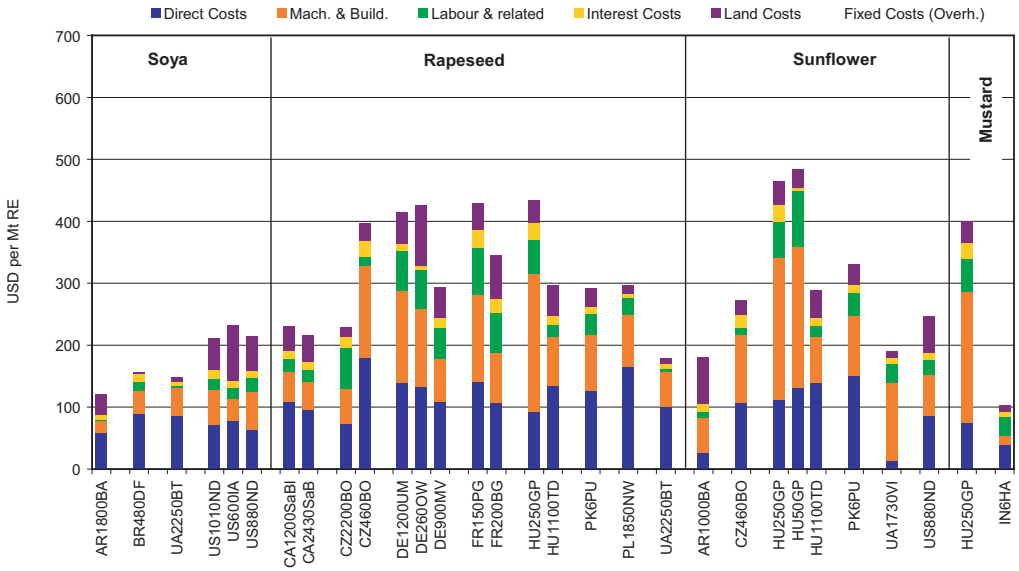
While these production cost differences are obvious, their composition is very heterogeneous and contains a lot of information. In Graph 3 it can already be seen that the 1000-hectare farm in Argentina and the 1730-hectare farm in the Ukraine have very few direct costs in comparison to the other farms. Furthermore it can be seen that the smaller farms in Hungary produce oilseeds with very high machinery costs.

The highest cost shares for land can be found in the United States and Argentina, followed by Western Europe, Canada, and with a small gap, Hungary, Pakistan, India and Poland. In Europe, land cost shares are in the middle range, but one has to keep in mind that direct costs, machinery and labour costs are higher than in most other regions and countries. Therefore land rents still can be high while their shares are low due to the fact that all other costs are high too. The lowest land cost shares are found in the farms in Brazil and Ukraine. The Czech farms have slightly higher land cost shares. Land rents normally depend on the profitability of agriculture (including subsidies) in a region and, or other demands for land from outside agriculture.

The labour cost shares are the highest in Europe, India, Pakistan and on one farm in the Ukraine. The group of countries where labour cost shares are high demonstrates that there is no direct linkage between wage rates and labour costs. It might be the case that, besides low wages, the management of a farm has to be good to reach low labour cost shares. The lowest labour cost shares can be found in Brazil and Argentina.

Machinery cost shares are especially high in some eastern European countries including one farm in Ukraine. In Hungary and the Czech Republic, the farms just bought a lot of new equipment, because this investment is subsidised by the European Union. The 1730-hectare farm in the Ukraine uses mainly old machinery. The 2150-hectare farm in Argentina contracts all field work out. Moreover this farm plants its soybeans directly. This way it saves a lot of machinery and labour costs.

Graph 3: Total Costs of Oilseed Production by cost items



Concluding Remarks

The differences between countries and regions in oilseed production costs become very clear in the analysis above. However, the results displayed above are only one picture taken at a certain point in time. Furthermore, the benchmarking results above fall short in explaining the differences and their reasons in depth. Continuing research is needed to understand the causes behind cost differences and their dynamics over time.

Based on the analysis above it can be concluded that the most competitive farms in oilseed production worldwide can be found in South America. However the farms in the Ukraine have great potential, too. Clearly the farms in Argentina show high profit margins at the moment with their very low costs. The farms in North America have adapted to their market conditions with reasonable costs of production for oilseeds. Europe, on the other hand, is in the process of adapting to the new market situation with a lot less subsidies and more open markets than in the past. This is forcing European farms to reduce production costs if they want to stay in the oilseed production business.

To understand the dynamics of cash crop production cost developments over time in differ-

ent countries or regions, the only solution is to repeat the benchmarking exercise annually. The organisation and purpose of the IFCN Cash Crop Network is designed to fulfil this task.

Further it is important to extend the IFCN Cash Crop Network to more cash crops and countries. That way the network will benefit all involved partners best. The utility for every part-ner involved increases with the number of partners in the network and with the number of crops covered by the analysis of the network.

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In addition to the sources mentioned above the IFCN-Cash-Crop-Network-Partners are a great source of information and knowledge and contributed a lot from their own sources!