

## OPPORTUNITIES OF SOYA PROCESSING AND PRODUCTION DEVELOPMENTS – COULD HELP THE COOPERATION WITH SERBIA?

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### ABSTRACT

*We compared the current soybean processing results in two cross-border region. The comparison is based on natural endowments, similar cultural and historical heritage and the different economic conditions, prevailing practice - experience means a rich variety, which include the economies operate and develop. First we made deep interviews from the marketing analysis tools, to reveal the professionals opinions and recommendations. SWOT-analysis was performed on soybean production and processing advantages, disadvantages, opportunities and risks. In the South Transdanubian region (Hungary) the soybean fields size are smaller and most of the produced crop achieved in relationship between production and processing integration of the Bóly Inc. Is no less important the obtained experience, the created culture, in the decision-making mechanism of the private farms. Can be very useful the reorganization in agriculture privatization and knowledge of structure change, which occurred in different ways and different in terms of results. The acquired knowledge, after appropriate adaptation gain application in practice. Taking into account the status of Vojvodina within Serbia and Serbia (EU) candidate country status expected to 2012<sup>th</sup> year and that the Vojvodina Region would open a Representation office in Brussels, there is a real chance of cooperation between the two regions. This situation allows the unrestricted movement of goods. Short time is not enough to change the approach, even not for professionals working in the sector. Changes may occur only, if born a marketing strategy, developed with patient and reasonable design work, in order to develop the soybean verticum.*

Keywords: soybean, soy production, soy products, soybean processing, cooperation

### INTRODUCTION

This Communication is an integral part of NATIONAL RURAL STRATEGY 2020 - Plant protein program. It also matches the Environment, Public Health and Food Safety, and the position and proposals of the EU Commission, which focus on the growing raising importance of soybeans. The Hungarian official position is that essential is the greater domestic production of protein sources and thereby replace the questionable human health acting, foreign protein sources and food additives (mainly Gm soy).

For this purpose is necessary re-thinking the already applied protein program and create new opportunities for R&D (*National Rural Strategy 2020*, 2011). Our aim therefore was to explore the possibilities of research and development in order to promote the soybean production and processing in Hungary, furthermore perform

the necessary preliminary studies based on the example of neighborhood Serbia as well as the operation's potential.

## **MATERIALS AND METHODS**

During the research we performed data analysis taking into account the different economic environment (state aid scheme), economic variables and technology parameters. For this purpose peer-depth interviews were conducted with Petar Sekulich Prof. Dr., who is the chief of the Plant Production and Kitchen Gardening Institute and professor on the Agricultural University in Novi Sad, with Jegor Miladinovich Dr., who is soybean breeder, scientific adviser and the head of the department of the Soybean in the Plant Production and Kitchen Gardening Institute in Becej. Also commented as specialist Ilona Estelecki, who is a technologist, specialist, deals with the use of soy product in bakery in Sojaportein Co.

Interviews were also made with Ágnes Schmidt who is trading assistant in AGP Hungary Ltd. in Pécs, with Sándor Lakatos in Kaposvár, who is a South-Transdanubian regional agent in ISV Co.

We made economic calculations what based on the obtained data and created soybean SWOT analysis.

## **THE PRESENT AND FUTURE OF THE HUNGARIAN SOYBEAN CULTIVATION AND PROCESSING**

Today, the annual average of soybean area are 30 000 hectares, with 2.3-2.6 tons /hectare average yield and 70 000-78 000 tons annual production level (AKI, 2011) sufficient to cover the domestic demand 10%.

In the production especially in the South-Transdanubian Region is a leader, (*Figure 1*) where the climatic and soil conditions ensure the successful soybean production and the yield did not away form our southern neighbor's yield. 400 000 tons was the soybean production in 2010 in Serbia, of which 210 000 tons the Sojaportein Co. (Becej), 85 000 tons the Dijamant Oil Factory (Zrenjanin) bought up. Average yield of soybean was more than 2.7 tons per hectare (*Curovich*, 2010).

In our country the most quantity of produced soybean used as full- fat soy for domestic animal breeding, the country the remaining portion exported in full fat form to Austria and Bosnia and Herzegovina. However, we imported annually about 673-846 thousand tons of soybean meal, mainly from Brazil / Argentina, through the West European, Rijeka and Black Sea ports to satisfy the domestic protein feed needs (*Sebóke*, 2009).

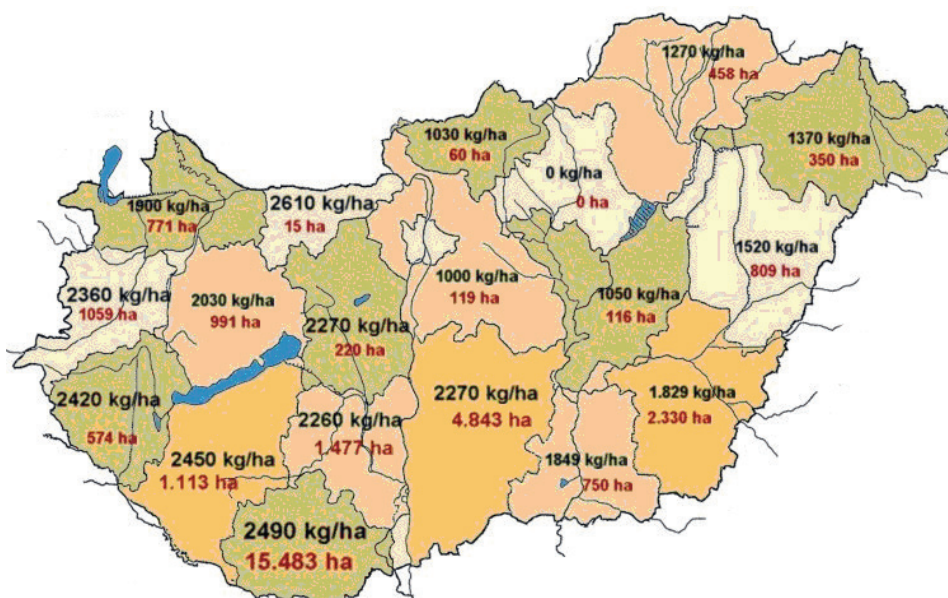
The import volume of soybean could push back, under the former potential, with increasing the domestic soybean production and processing.

*Figure 2* certifies that it is possible to increase soybean production area according to the previous years the level of 1988-1989, when the Bóly Combinat had the Sojaprotein Co. Becej process the significant portion of the produced soybean.

Testing with new species show that the yields per hectare may reach 4 to 4.5 tons in South- Transdanubian Region (*Elitmag Ltd.*, 2010).

Figure 1

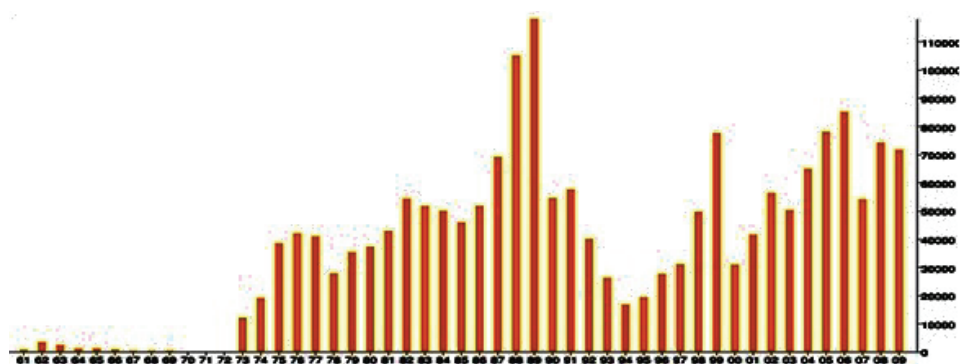
The average of the soy production and harvested arable land development in each country, 2009



Source: *Blue Seed Ltd.*, 2011

Figure 2

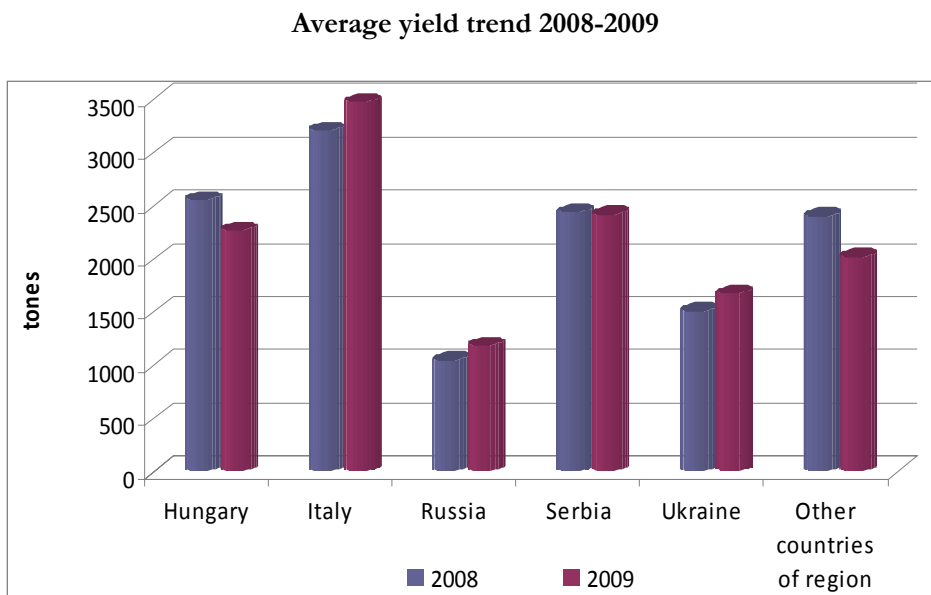
Production quantity of soybeans in Hungary between 1961 and 2009



Source: *FAOSTAT database*, 2011

The domestic average yield data comparison with other European countries is also confirmed the possibility of the rational increasing the production area (*Figure 3*).

**Figure 3**



Source: *Blue Seed Ltd.*, 2011

*Figure 3* shows that after the very high results in Italy, the Hungarian farmers are able to produce higher average yield, but at least do not lag behind other countries. From the Southern- Transdanubian Region producers should be highlighted the Margitta-Sziget Ltd. in South-Baranya, who make farming on 3700 hectares on alluvial soil and of which ca. on 1230 hectares are grown soybean. The company next to the production performs seed producing too.

The other dominant company is the Bóly Co., which is under the Bonafarm Group. The Bóly Co. farms nearly on 20 000 hectares in the Danube and Drava triangle. Integration of the soybean production activities with the assistance of previous partners gave to the Bóly Agrochemical Ltd. in spring 2008. They also have experimental and research department in Bóly.

The third dominant company is the AGP Hungary Ltd. in Pécs. The company was established in 1995 with American majority ownership. Their main profile is manufacturing and marketing premixes, concentrates, as well as importing soybean meal for feedstuff and protected protein (*Horvát*, 2010).

## **THE SERBIAN SOYBEAN PRODUCTION AND PROCESSING**

Serbia followed on the direction both of the world's oil plant production and bio-fuels and the production of food oils growth based on the government program.

Soybean as a high protein product is an important element in the economic and pet feeding and forms the basis for the livestock development in meat and milk production. Serbia counts as one of the largest soybean processor in Europe, considering the capacity, it is between the first five. Soybean producers and traders in Russian Federation, Ukraine, Romania, Bulgaria and Hungary influence the oil seed market in the region, which have an impact in Serbia and it influences soybean pricing, which can affect the production decisions.

The general trend of the cultivated area is increasing. The soybean yield is diverse depending on the frequency of drought years. Soybean production shows a continuous growth in the last ten years (300 000-400 000 tonnes/hectar), 2001-2007 the cultivated area 130 000- 160 000 hectar with 1.20- 2.80 tonnes/hectar yield and annually near 29 000-75 000 oil production. About 2/3 of the production areas are in the hands of family farms and although specifically in smaller area, but several larger company gladly insert this plant into the crop rotation (*Table 1*).

**Table 1**

**Distribution average of oil plants production by type of company (2008-2011)**

	Company		Family farm	
	piece	thousand hectar	piece	thousand hectar
Soybean production	220	45	26000	108

Source: *Ministry of Agriculture Serbia*, 2011

Throughout the country pay great attention to the selection of appropriate seed varieties and hybrids, as well as fertilizers and pesticides recommended quantity. The oil seed producers generally respected these recommendations with regard to the yield and quality to reach the European level. The soybean seed processing is in the context of the University of Agriculture in Novi Sad. Domestic soybean hybrids may appear primarily in the variety of types and these, in accordance with the law can not be genetically modified. The State’s measures level in relation to GM soy is variable from year to year. There is no consistency of GM soy cultivation in connection with illegal appearance.

In 2008 intensive measures have been taken, unlike in 2007 when almost nothing has been done to control the GM soybean cultivation areas. However in 2009/2010 year the known GM soybean fields were destroyed and against the farmers started criminal proceedings. The exemplary developed production capacity combined with a well-organized processing. There are nine oil and protein crop processing factories in Serbia and all of them organize the oil and protein crop production as an integrator. These factories organized in business company, called “Industrial Crops” Management Community in Novi Sad. The processors operate alternately in oil seed processing, which means that their technology is suitable to process canola, sunflower and soybean in batch mode and seven of these factories have the ability to process soybean near sunflower and canola during the year, while two oil factories may process only soybeans. *Table 2* shows the factories collective processing capacity.

**Table 2**

**Processing capacity of factories**

Product	Thousand tonnes
Sunflower	2.483
Soybean	2.216
Canola	953

Source: *Serbian Agricultural Inspectorate*, 2011

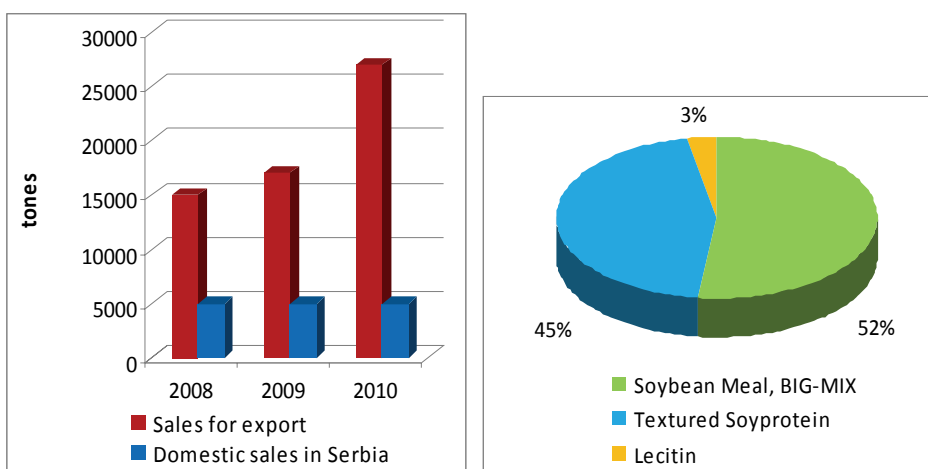
Refers to the oversized capacity that in Serbia the soybean acreage varies between 145 000-155 000 hectares with 380 000 tons of soybean goods volume. The average utilization of installed processing capacity was only between 25-33% in recent years.

**MARKET OF SOYBEAN PRODUCTS**

In Serbia undoubtedly the soybean expected the most important export product among the oil seeds. Based on the available data, the soybean oil export was 32 014 tons in 2007, with 27 537 395 USD, which is 1.63% of share of the exports of agricultural products. In the same year, from the oil crop family the soybean meal was imported in the largest item, in 33 303 tons and in 12 473 632 USD value, what is 1.12% share of the import of agricultural products (*Serbian Ministry of Agriculture and Commerce*, 2011). According to the data of Sojaprotein Ltd. (Becej), the soy food consumption (soy flour, semolina, blends, textured foods, lecithin) was ca. 5000 tons/ year in Serbia’s domestic market in the years 2008-2010 (*Figure 4*). In the same time period, the export sales from 2008 year 15 000 tons increased to 17 000 tons in 2009 and in 2010 exceeded 27 000 tons.

**Figure 4**

**High-level processing soy products sales 2008-2010**

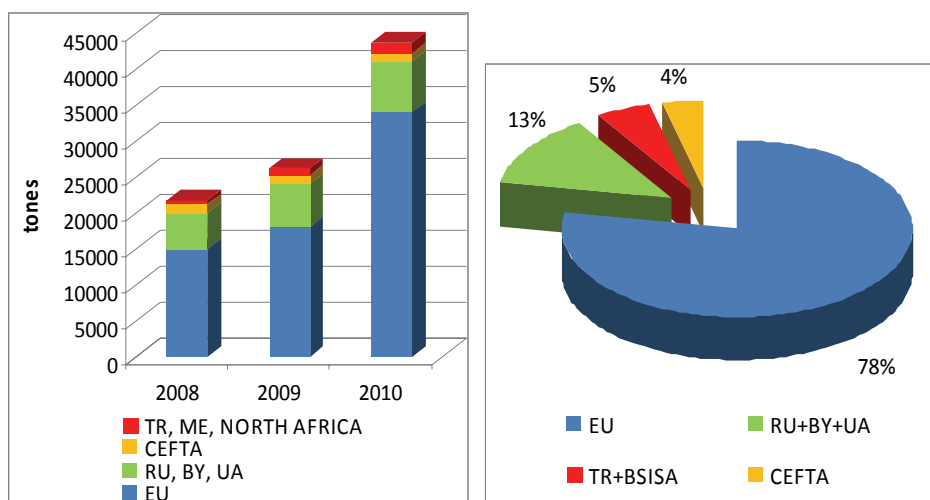


Source: Based on data from *Sojaprotein Ltd.*, 2011

Furthermore we can read on the *Figure 4*. that the flour- semolina and blends proportion was 52% - 45% - 3%, based on the textured product sand lecithin quantity. The next examined factor was the export sales development, during which firstly the customers (*Figure 5*), then by categories are presented the results (*Figure 6*).

**Figure 5**

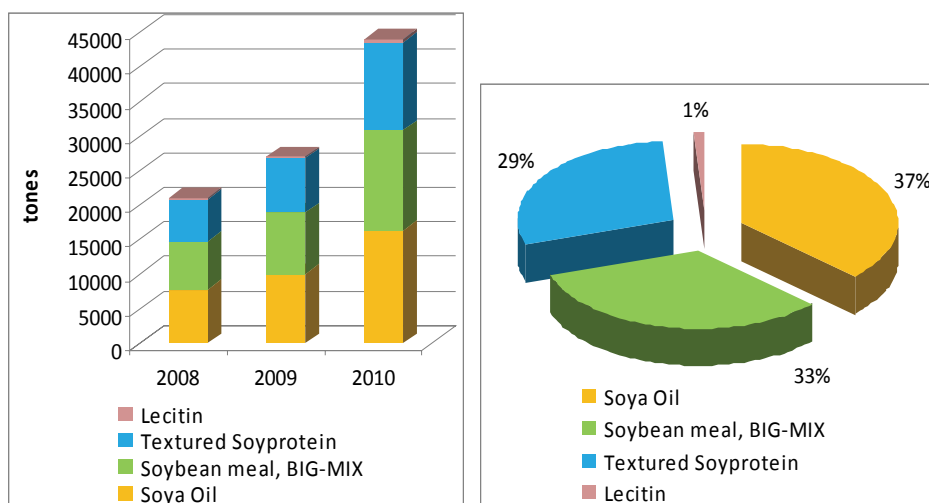
**Export sales in regional distribution share 2008-2010**



Source: Based on data from *Sojaprotein Ltd.*, 2011

**Figure 6**

**Export sales 2008-2010, high-level processing soy products sales**



Source: Based on data from *Sojaprotein Ltd.*, 2011

The 78% of export reached in EU countries in 2010, 13% found in the Russian Federation, Ukraine, Belarus and 5% in Turkey, Near- and Middle-East sales and 4% of volume in former Yugoslav Republic. By type of product is worth more attention paid to the examination for three years (*Figure 6*).

Based on *Figure 6* results the soybean oil clearly counts as a successful products, which export from 5000 tons increased to 20 000 tons during two years and took the lead from textured products. In soybean oil export the most important partner is the EU including Slovenia.

### **COOPERATION OR COMPETITION?**

The protein crop production is strategically important for Hungary. If the country not able to produce their protein needs (or a sustainable part of it), could become dependent for the current market conditions. The protein shortage of livestock means a not acceptable risk, which is largely threat the optimal satisfaction of feed requirement. Also passes a serious threat that the soybean production area declined after business privatization. Major research and development needs and opportunities were remain on new varieties breeding with sufficiently large and more secure yield. However on the positive side, that from farmers there is an interest in the cultivation of soybeans, there are available expertise and professional experience. This is confirmed by the soy round table for the priority partners, what was held first time on 1st of March 2011 by Baki Agro Centre, as which one main message was: „There is no replacement protein crop for the soy, nutrition point of view can not be replaced” (*Baliko, 2011*).

We prepared the SWOT analysis of soybean (*Table 3*), based on the examination of the soybean production and specificities of the market in the two countries, which is essential to drawing up a strategy.

The long term profitability of soybean verticum based on staff estimates principles can be stated that the cross-border relationship of soybean cultivation and processing is justified, because non- GMO soybean for feed and food products are competitive. But it is important not to start with the same equity and operational integration thinking, but rather along the identity of interest. Indicates on the incomplete marketing strategy and on inadequate processing that in Hungary the soybean processed in full-fat product. Case of a higher level of processing could be avoid that a GMO- free soybean primarily intends for animal feeding, where the domestic soybean quality is not appreciates. The processing for human food should enhancing the Hungarian soybean production value, should increase the production profitability, because it should appear successfully on the shelves of supermarkets, opposite of the consumed soybean products for meat and bakery products from foreign markets. Based on the carried research, the soybean verticum area is suitable to describe the product line successive economic process. This means that the soybean production based on the local features, in the region independently operated, but complementary actors- operates a sustainable manufacturing industry and marketable processes with involving companies- create soy products.



**Table 3**

**SWOT analysis of soybean**

<b>STRENGTHS</b>	<b>WEAKNESSES</b>
<ul style="list-style-type: none"> <li>- Appropriate crop conditions, favorable natural conditions;</li> <li>- Known and acquired production technology;</li> <li>- Regions rising demand for soy protein;</li> <li>- Strict rules against the cultivation of GM soy;</li> <li>- Market demand;</li> <li>- World-class infrastructure in soybean processing.</li> </ul>	<ul style="list-style-type: none"> <li>- There is little available land;</li> <li>- 2.3 t / ha yield in soybean production is not profitable;</li> <li>- Cultivation of soybean varieties for food production is not the most appropriate amino acid composition;</li> <li>- Logistical disadvantages;</li> <li>- Weather heavily influencing role.</li> </ul>
<b>OPPORTUNITIES</b>	<b>THREATS</b>
<ul style="list-style-type: none"> <li>- Break into new markets, new market segments;</li> <li>- In addition to the import of products is complementary (complementary to or / substitutes) product introduction;</li> <li>- Regions soy vertical integration;</li> <li>- The introduction of new soy foods;</li> <li>- Soy cheap transportation by water and connecting it to the border regions.</li> </ul>	<ul style="list-style-type: none"> <li>- Cheap (South America) GMO soybeans and soybean meal;</li> <li>- Significant barriers to entry to the market;</li> <li>- The bank financing risks;</li> <li>- Considerable rivalry.</li> </ul>

**CONCLUSIONS AND RECOMMENDATIONS**

The future of marketing research should answer how the regional soybean attitude for its competitors in order to avoid the results of bad losses because of their presence. Needed new ideas and quality technology. The mapping of current soybean market situation in South- Transdanubian region must be part of the ambitious, practical market research and using that made marketing strategy as a result of which we may get essential, safety and revenues information for developing the domestic soybean verticum. However it is important to point out that not enough to keep an eye on the competitors, several vertical integration may be present in the market competition.

In the future the soy products market may be as follows:

1. The regulations and laws are changing the market structure
2. The buyers (feed manufacturers, food companies) will start back on the value chain and integrate, will quickly assume as competitors opposite of the emperors in the market.
3. The farmers (soybean producers) will begin to integrate, build up their own processing capacity and climb up in the market as competitors.

Comparing to the two border regions, on the largest area and in most complex level of processing is Backa in Vojvodina.

A possible cooperation would justify the decisions subject, level and time effects, which the following tasks are required: do economic analysis to underlying operation decisions; forecast the short- and long-term opportunities according to the temporal effect survey of interests according to decision levels; recurring options analysis based on the combined dependencies of options.

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