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Ph.D. Thesis

ECONOMIC ASPECTS OF WHEAT AND CORN PRODUCTION UNDER DIFFERENT CONDITIONS OF PRODUCTION SITES

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INTRODUCTION, AIMS OF THE RESEARCH

Cereal branch is traditionally the most significant branch of the national arable crop production. This is proved by the rate of its cropping area, the crop quantity and production value produced yearly, as well as its role in the domestic food supply and in animal production based on the branch. Major portion of agricultural farmers cultivate some kind of cereals. The profitability of wheat and corn productions, being the most important cereals, influence significantly the farm income. In this way, knowing and analyzing factors effecting profit of production, and investigating typical tendencies of production are vital. Hungary's EU accession requires new view and way of thinking in crop production, especially in the field of wheat and corn production. Tendency of production cost, the low reachable profit in the branch, problems in storing and marketing of previous years highlight the need of rethinking the actions relating to the branch. In order to get back our lost international competitiveness, we should think it over that which crop should be cultivated in what large area and by how much input.

The technical literature dealing with evaluating the situation of cereal production by different economic indicators, and with studying its the role and competitiveness is extremely wide. However, branch analysis focusing on different production sites and new elements for regulating the market and made according to certain farm data have become insignificant in recent years. Realizing this, I started to make detailed economic analysis on the two most important branches, wheat and corn production, and making difference between conditions of production areas. I figured out my aims considering the opportunities and limits of the doctoral research.

I wish to answer to the following questions in my dissertation:

- How does the situation and role of cereal production look like in the world? What kind of international trends in the market may be expected and how do they influence Hungary's market chances?
- What significance does cereal production have within the agriculture, what tendency does the production standard and efficiency have in wheat and corn production?
- How do the production sites (especially land quality) influence the profitability of wheat and corn production?

- How did the joint farms producing crop for market operate in the wheat and corn branches between the period of 2000 and 2003 under different land quality?
- How large is the need of the two branches for moveable assets and how it is timed?
- How much profit may be forecast in wheat and corn branches between 2004 and 2007 considering the presently known regulations, in areas having different conditions? What subsidies may require our farmers in the near future, and what kind of effects do they have on the profitability of farming?

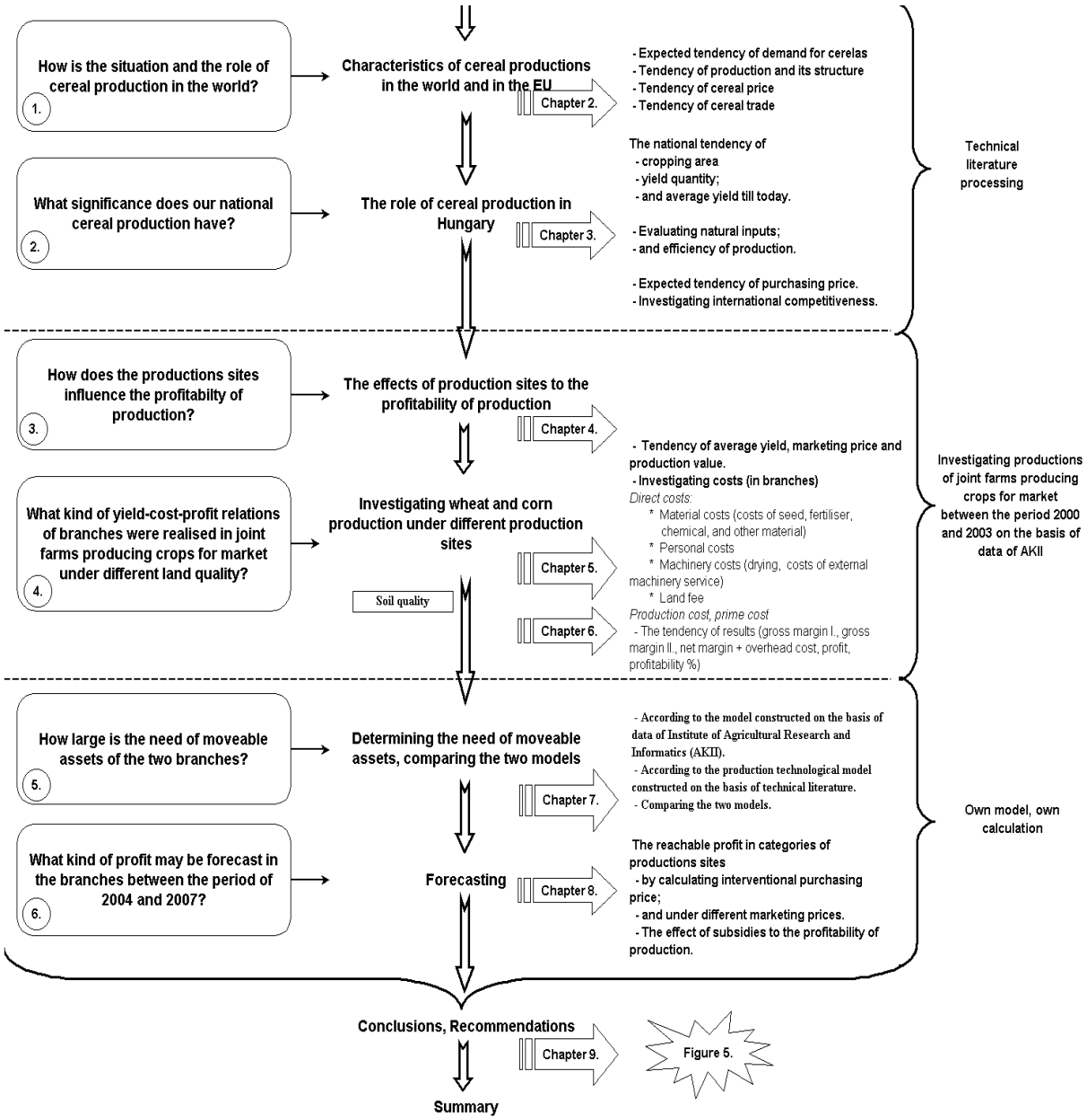
In order to answer to these questions, in my dissertation…

- I strive to introduce the international situation and its expected tendency of cereal production,
- Studying the cropping structure, the production volume, the average yield, natural inputs and efficiency I introduce the significance of national role of cereal production,
- I pay extra attention to the role of differing production sites (especially land quality) influencing profitability in wheat and corn branches.
- I make economic analysis on results reached by joint farms producing crops for market under different land quality, moreover I examine the yield-cost-profit relations of production for the period of 2000 and 2003.
- I make calculations for determining the need of moveable asset from two different aspects,
- I forecast the expected profit between 2004 and 2007 considering the presently known regulations in areas having different conditions, as well as I introduce the effect of subsidies to the profitability of production.

I would like to reveal several critical points of the domestic practice in my dissertation, as well as the need of wheat conception, which examines the crop production and animal breeding in a complex way. I highlight the opportunities and alternatives in the branches. Figure 1. summaries the aim and field of the research, as well as the structure of the dissertation.

The selected topic fit significantly to the "Doctoral School of Interdisciplinary Social and Agricultural Sciences", and to the PhD program called the "Economics of Agricultural Enterprises and Rural Development".

Figure 1. **Aims and Fields of the Research**



Source: own constructed figure (2005)

PRELIMINARIES AND THE UTILISED METHOD

My thesis contains altogether 183 literatures. Besides looking through international technical literatures on the role of wheat and corn production, I analyzed literatures dealing with effects of productions sites to yields with a special consideration of land quality.

During my research work, I investigated data of wheat and corn production in joint ventures producing crops for market. The database of the period 2000 and 2003 was collected from the Research Institute of Agriculture Economics. The reason of choosing this period was that representative data having reliable basis for making comparison, and having suitable structure and details for my investigations have been available since 2000.

I started data processing by reducing the observed units. I selected farms that serve data in every year within the four-year-long period, and determined the number of farms where wheat and corn productions were carried out. These selections would have reduced the number of the examined farms to 23, which would have made the conclusions made from the analysis on land quality unreliable. In the end, after the technical and statistical analysis of data (SPSS, box-plot method) I made my branch-level analysis on the basis of farm data of 1 106 farms (Table 1.).

Table 1.

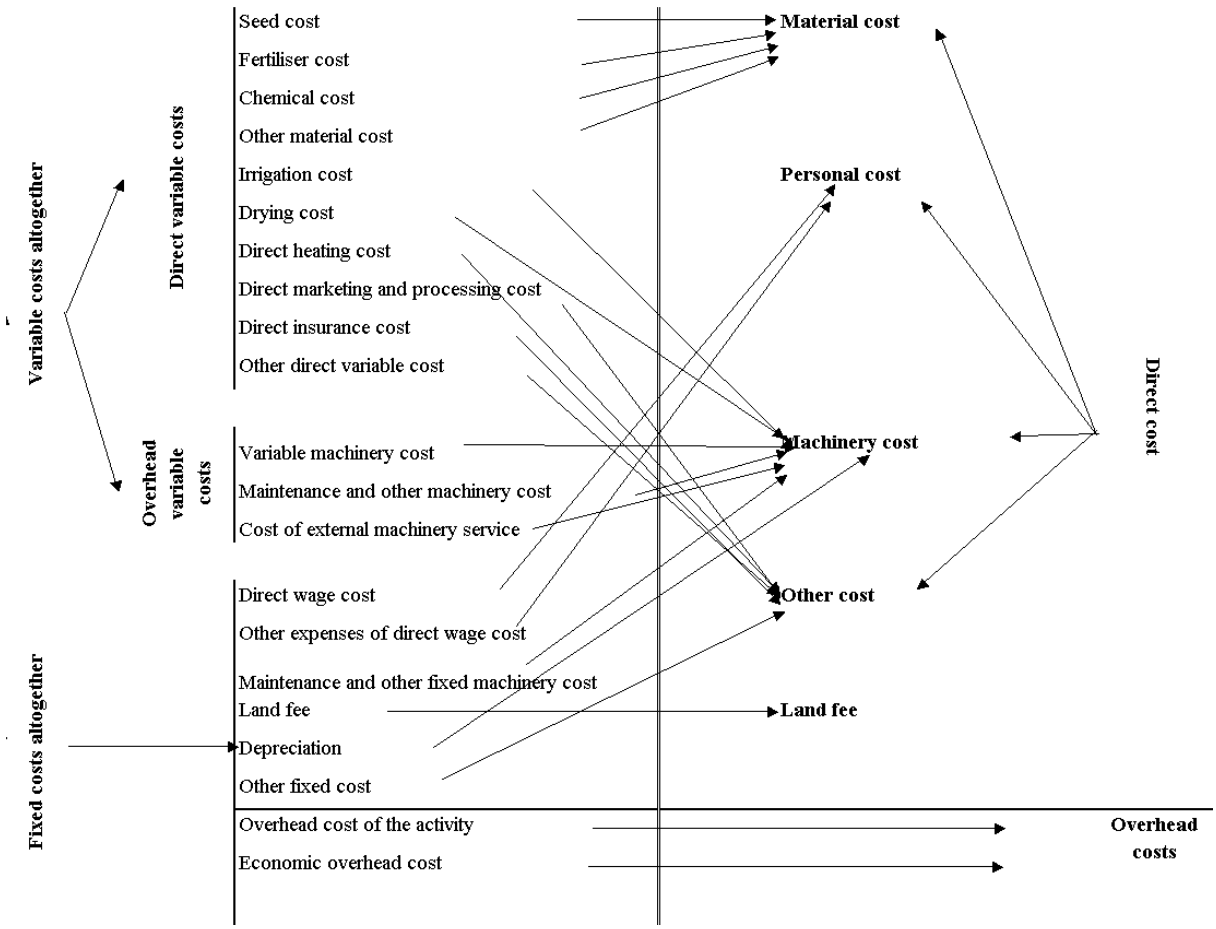
The Structure of Test Farm Database Between 2000 and 2003

Year	Number of Farms in the Pattern	Number of Farms Producing Crops for Market	Number of Either Wheat or Corn Producing Farms		Number of Farms Utilised for the analysis	
			Wheat	Corn	Wheat	Corn
2000	292	133	112	82	101	74
2001	369	156	119	104	117	101
2002	492	207	207	185	204	179
2003	466	202	176	170	166	164
Total:	**1619**	**698**	**614**	**541**	**588**	**518**

Source: Institute of Agricultural Research and Informatics (AKII), Test Farm Database (2004)

I explored connections between cost types being necessary for branch economic analysis and cost indicators registered in the test farm system and I determined the yearly average costs and cost structures of both branches according to the traditional categories and even to categories of the new indicator system (Figure 2.).

Figure 2.: **Connections Between Data Needed for the New Indicator System of Test Farm System and for Economic Investigation of Branches**



Source: own constructed figure (2005)

Besides the cost structure, I compared the yields, prime cost and profit indicators of the branches. I established the spread of prime costs by taking the lower and upper deciles (10-10%) of firms in to consideration.

With the help of the SPSS program 12.0.1 for Windows, I investigated the correlation of yield and three quantities being typical to cultivation from different aspects. During my calculations, the sowing area represented the production size, the per hectare direct costs reflected the inputs and the average AK-value of the areas showed the conditions. After establishing AK-groups, I made more detailed investigations on effects of land quality to results among the effecting factors. I carried out the economic analysis of wheat and corn production under different land quality on the basis of the traditional indicator system in cost units with the help of the program Microsoft Excel 2000 as well as of its expanded

program called Analysis Tool Pack. During investigating costs in an extremely detailed way, I considered even the inflation and the yearly price indexes of agricultural inputs.

I determined the need and timing of movable assets on the basis of test farm data and the cultivation technology model and compared them. Then I predicted the expected cost and profit conditions of wheat and corn production for the period of 2004 and 2007 by using test farm data.

MAJOR FINDINGS OF MY DISSERTATION

I carried out the economic analysis of domestic joint ventures producing crop for market under different conditions of production sites. I utilized the results of the analysis in my model calculation and when making the forecast of the branch.

Natural conditions, and weather have great influence on yields. The weather anomalies between 2000 and 2003 caused yearly altering yields on farms, especially in the corn branch. On the basis of investigating factors influencing yields (cropping area, direct cost, land quality), the correlation of AK-value and the average yield reflects in the branches, and the correlation in wheat was stronger in every year than in corn. (AK-value is "the "taxable net income" of each parcel of land registered in the land cadastre was established almost a hundred years ago, in the execution of Act VII of 1875, and was later converted to Gold Crowns, the monetary unit of the Austro-Hungarian Monarchy. This valuation still serves a basis of valuating agricultural land for the purposes of taxation or redemption. The national average of taxable net income of all agricultural land was 19.46 Gold Crowns per hectare.").

The differences of yields between the created AK-groups reflected the experiences in technical literature (Table 2.) The great number of test farm database strengthens the economic significance and effects of different production sites to the production results.

Table 2.

The Average Yield in Wheat and Corn Branches on the Basis of Land Quality

(tone per hectare)

AK-groups	Wheat				Corn			
	2000	2001	2002	2003	2000	2001	2002	2003
<10,0	2,59	3,28	3,31	2,49	2,83	4,81	5,08	3,20
10,01-15,00	3,22	4,07	3,21	2,72	3,72	5,98	4,89	3,69
15,01-20,00	3,39	4,35	3,34	2,79	4,55	5,84	5,25	4,10
20,01-25,00	3,12	4,82	3,67	2,95	5,11	6,82	5,45	4,35
25,01-30,00	4,25	4,76	4,72	3,01	4,93	7,25	6,96	4,12
30,01-35,00	4,50	5,34	4,53	3,60	5,58	8,60	7,79	5,07
>35,01	5,42	6,04	5,22	4,61	6,37	10,19	7,67	4,86
Average	**3,73**	**4,62**	**3,79**	**3,09**	**5,05**	**6,88**	**6,02**	**4,24**

Source: own calculation on the basis of test farm survey of AKII

The per hectare production cost between 2000 and 2003 increased yearly in both branches, altogether by 15%. The cost structure of the branches is rather uniform. The biggest ratio from direct cost has the machinery cost (36 to 43%). Material cost is another significant cost element (36 to 40%). Thus, the machinery cost and material cost take up of 72 to 83% of direct cost. Land fee is 8,8 to 13,2, personal cost is 3,4 to 8,6%, and other direct cost is 3 to 6% from direct cost.

Naturally, the per hectare costs in farms according to AK-groups shows variable situation yearly, which is illustrated by the data in Table 3.

Table 3.

Direct Cost of Wheat and Corn Production Under Different Production Sites

(HUF per hectare)

Denomination	Wheat				Corn			
	2000	2001	2002	2003	2000	2001	2002	2003
<10,0	67 167	99 647	82 706	95 882	94 018	106 643	100 875	118 874
10,01-15,00	72 580	90 323	82 582	93 944	99 251	117 271	104 408	110 578
15,01-20,00	76 493	75 459	79 449	93 722	98 856	104 106	115 254	117 952
20,01-25,00	69 898	85 107	84 412	91 980	106 194	115 927	118 170	118 797
25,01-30,00	87 970	91 694	96 154	97 059	108 240	125 007	132 996	126 315
30,01-35,00	95 399	94 130	91 961	99 864	97 903	125 762	131 346	143 256
>35,01	73 586	106 324	116 792	103 818	94 063	132 164	143 260	115 451
Average	**77 739**	**84 838**	**86 177**	**95 199**	**101 039**	**115 953**	**121 335**	**121 254**

Source: own calculation on the basis of test farm survey of AKII

The following conclusions may be done on the basis of my calculation for production costs of joint ventures producing crop for market between 2000 and 2003.

- The ratio of machinery cost from direct cost decreased in both branches in the examined period. This means not decreasing inputs but the increase of weight of other costs (e.g. personal cost). Within the machinery cost, variable machinery cost (43 to 66%) and cost of external machinery service (9 to 16%) have significance. Even drying cost has a determining role.
- Separating and explaining the internal structure of machinery cost is not consistent from the point of view of the farms involved in data supply. The classification of variable machinery cost separated within the machinery cost, as well as maintenance and other variable and fixed costs of machinery is changing in the AK-groups and on the consecutive years. The average machinery cost typical to all of the farms may be characterized by narrow interval; there is not any correlation experienced between production sites and machinery cost. It is significant in volume; it may be hardly reduced in connection with other cost factors.
- Drying cost of wheat production is increasing towards better conditions of productions sites, due to the more favourable average cost. At the same time, the correlation between average yield and drying cost is not linear relating to all of the involved farms. Comparing the drying cost of a certain production site with the average yield of the given year the correlation is weaker, that is other factors (wet content at harvesting, cost of removing a unit of water) influenced the drying cost more significantly than the yield itself. On the basis of data of four years, the relative weight of drying cost from direct cost in wheat decreased.
- The per hectare drying cost of farms belonging to the high AK-groups is lower than that of farms cultivating under lower land quality. According to my supposition, the rate of farms of high AK-group having own drying firm is extremely high, while farms in the lowest AK-group are constrained to hire drying. The yearly changing machinery cost in corn branch is caused by mainly the drying cost: the yearly drying cost sometimes hides (2003), sometimes strengthens (2001) the continuous cost increase caused by the inflation.

- There is not much regularity in the tendency of costs of external machinery service, as the involved farms have different machinery supply and altering technical standard. On the other hand, groups of farms cultivating above 35 AK-value required external machinery service below the average of every farm relating to the four years, and those who cultivated below 10 AK-value, hired external service above the average.
- I conclude that the majority of farmers cultivating under the most favourable natural conditions, have the necessary machinery capacity, supposing the harvester supply exceeding the average.

The second largest cost group is the material cost. The most significant is fertiliser cost (31 to 39%), the seed cost is 30 to 35%, the chemical cost takes up of 26 to 33% from the unfavourable material costs.

- Fertiliser cost is a considerable factor in both branches, though the data of the latest years prove that it fits into farming system in a less sizeable way. When studying the input price and utilization of fertilizer, even the minimum quantity of fertilizer necessary for the profitable production was not applied between 2000 and 2003.
- Expenses used for nutrient supply was changing according to AK-groups, its volume is correlated with the profit of the previous year. Quantity of fertiliser above the average may be experienced in corn branch under land quality of less than 10 AK, where production is often loss-making, which proves the fact that farmers do not count on only the nutrient revealing by a natural way, thus their inputs are equalized. The low yields of the year 2003 justified the fact that the low level of nutrient goes with high risks in unfavourable years.
- Producers can hardly influence a seed cost, which is proved by the narrow interval of average seed cost on the basis of AK-group. The volume of this cost is determined by even the market price of seed besides the biological need of crops.
- There is a strong correlation between the market price and the seed supply of previous year in wheat. The rate of renewing, as well as the prime cost of own produced seed also affect seed cost in the branch. Investigating the cost, it turns out that the price of verified seed increased considerably (by 42%) within the examined period.
- The ratio of seed cost from direct cost shows a decreasing tendency on better land quality, which refers to the increase of other costs.

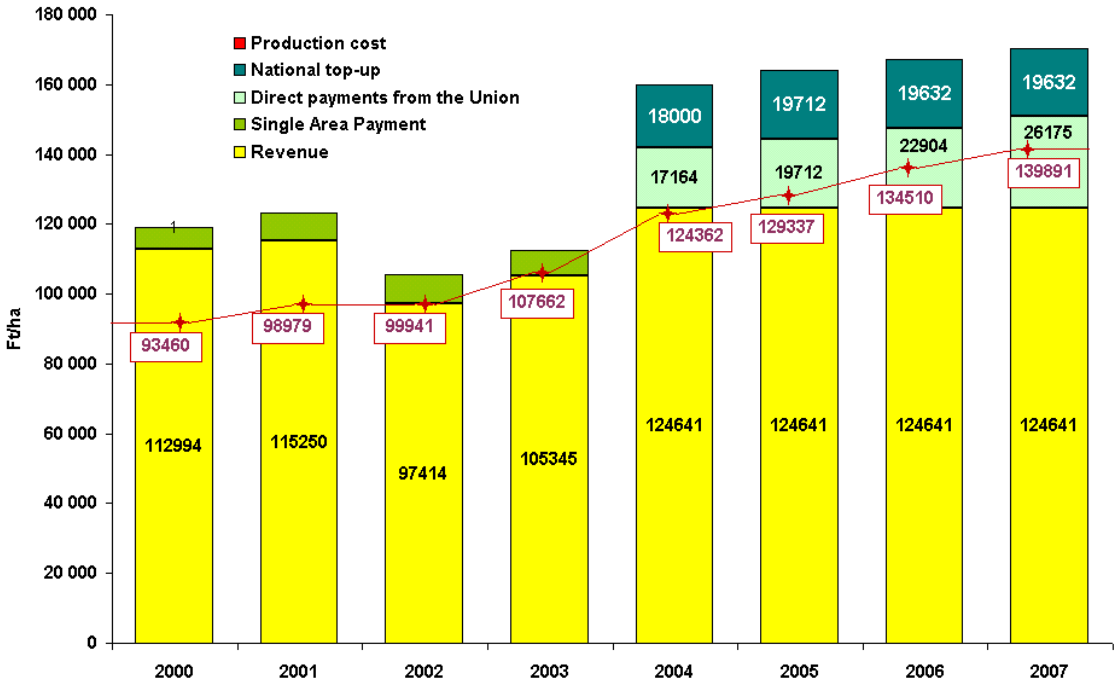
- The increase of seed cost exceeded the inflation in both branches in the examined period. The purpose is not to reduce this cost but to select proper seed being in harmony with the standard of inputs.

- Expenses for chemicals are rather altering in both branches in groups having different conditions. Due to the relatively law chemical seed of groups below 10 AK-value, it may be supposed that more extensive production technology is carried out in these areas. Farmers having the most favourable conditions of production sites believed that their surplus inputs would return thank to the yield increase.
- Land fee also affects direct cost (8,8 to 13,2%). The changing land fee in the period of 2000 and 2003 was determined by the yearly wheat price forming the basis for its establishment. Its rate from direct costs is increasing due to the increasing AK-groups, except for the farms having the highest AK-value. In the cases of farms having the most favourable conditions, owning and utilizing the land is often coincided , thus the rate of land fee is relatively lower. The per hectare land fee in corn production exceeds considerably that of wheat production. The reason is that land fee was not linearly calculated to branches, but they were calculated on the basis of direct costs.
  The improving profitability of wheat and corn production will make the farmers interested in expanding their territories, which will raise land fee significantly.
- Cereal production requires small amount of labour. Inspite of this, there was a huge increase in personal cost within the investigated four years, because of the compulsory raising of minimal wage. The increasing rate of personal costs may be good followed in the consecutive years in farms having different natural conditions (AK-groups), especially in corn.

On the basis of the production technology model constructed by myself is can be seen that the costs of technology containing optimal and reasonable inputs exceed the incurring costs in both crops. The construction of the model highlights the fact that replacing and renovating machinery may take place in only few farms. This constraint saving is reflected as the material cost calculated on the basis of test farm data, lags behind the similar values of the production technology model in both wheat and corn branches. The differences that are realizable in the land rental fee, come from the differences between marketing price and the interventional purchase price.

- Per yield profit of wheat and corn was contradictory in the period of 2000 and 2003 in the joint ventures producing crop for market: altogether profit positions of both crops declined. The per hectare profit of wheat falls behind by 16,7% in 2001 than that in previous year, while it is 9,4% in corn. Both branches were loss-making in 2002. In 2003, corn reached only one tenth of the profit that was realized in 2000, wheat was further unprofitable.
- The land based subsidy (6 to 8 thousand HUF per hectare in average) slightly improved the situation of the branch. Profit reached in 2002 (even in 2003 in wheat) was thanked to this subsidy (Figure 3. and 4.)

Figure 3. **Cost and Profit Relations of Wheat Production Between 2000 and 2007***



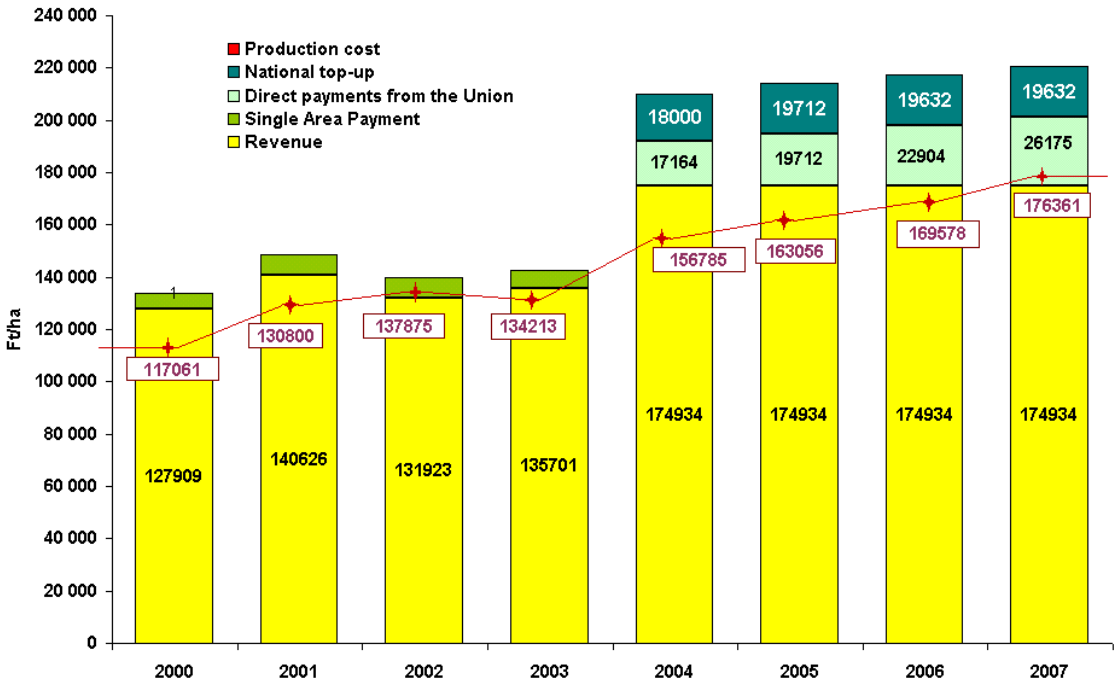
* between 2000 and 2003: calculated average values on the basis of test farm data, between 2004 and 2007 contains average data of own made forecast

Source: own constructed figure (2005)

- According to the forecast for the years 2004 to 2007, when calculating interventional purchase price supposing 4% inflation, regardless the direct producers' subsidy, the profit situation of both branches declines gradually, or the subsidies compensate the losses (Figure 3. and 4.)

- This illusory situation distorts the real competitiveness, as farmers do not feel the necessity to change. To my mind, the purpose should not be the compensation of losses with single area payment. Farmers should endeavor to maximize profit. To reach this, besides the single area payment, crops should be cultivated, which realize profit. The domestic agricultural strategy should handle areas, where subsidized crops may not be cultivated successfully.

Figure 4. **Cost and Profit Relations of Corn Production Between 2000 and 2007***



* between 2000 and 2003: calculated average values on the basis of test farm data, between 2004 and 2007 contains average data of own made forecast

Source: own constructed figure (2005)

- When investigating prime costs on the basis of land quality categories, the determining role of land quality may be observed even in years having adverse weather conditions (2000, 2003). Prime costs were higher in areas having low land quality, than in areas having higher AK-value. The biggest difference between the prime costs of areas having a land quality lower than 10 AK and higher than 35 AK, occurred in the two years having the least unfavourable weather conditions. I conclude that the harsh weather conditions widen further the differences in land quality categories.

- My further calculations prove that there are differences between groups of land quality in the case of the amount of reachable profit. In both branches the connection between the followings, such as bad weather, less yield, higher marketing price, higher reachable profit may be discovered.
- On the other hand, the connection between better land quality and higher profit may be followed with difficulties in corn, and a reasonable profit may only be reached on land having a land quality higher than 35 AK per hectare even under favourable weather conditions.
- According to the forecast made for the wheat branch for the years 2004 to 2007, because of the low yields farmers cultivating on land having a land quality less than 15 AK may only reach profit by the direct producers' payment. Analyzing the profit relations of the other AK-group, extremely low profit may be realized from production, and the direct producers' payments result the majority of the profit volume. The forecast made by utilizing the interventional price informs that wheat production is not perspective on the present producers standard. The average yearly increase of production costs by 4% will use up the direct payments to an increasing extent from year to year (Table 4.).
- According to my calculation, it is not advisable to cultivate corn on land having a land quality less than 20 AK. In a short term, the purchase price will mean the interventional price for the domestic producers. The improving conditions of productions sites (higher AK-value), however, will result in favorable profitability. This proves the fact that our corn production should be concentrated to land having a land quality of higher than 20 AK, and to land with the best conditions (above 30 AK). The yield potential of corn is higher than that of wheat, and its utilization to a middle extent may result in profitable cultivation (Table 5.).
- Reflecting the present situation, there is little chance to market crops on a price, which is higher than the purchase price. Thus the profitability of cereal production will depend on cost relations and yields. Our producers will get into an intensified situation, the little profit or loss, will be compensated by the income from the single area payment.

Table 4.

The Forecast Cost and Profit Relation of Wheat Production for the Years 2004 to 2007 in Joint Ventures Producing Crop for Market, on the Basis of Land Quality

Denomination	Unit	Land Quality (AK per hectare)				
		<15,0	**15,01-20,00**	**20,01-25,00**	**25,01-30,00**	**>30,01**
Average Yield	**t/hectare**	**4,00**	**4,74**	**5,01**	**5,26**	**6,20**
Average Marketing Price	**HUF/t**	**24 720**	**24 720**	**24 720**	**24 720**	**24 720**
2004						
Revenue	HUF/hectare	98 982	117 072	123 845	130 025	153 278
Direct Payment	HUF/hectare	35 164	35 164	35 164	35 164	35 164
Production Value	HUF/hectare	134 146	152 236	159 010	165 190	188 442
Total Production Cost	HUF/hectare	111 637	112 227	119 031	127 790	151 127
Profit I.	HUF/hectare	**-12 655**	**4 845**	**4 815**	**2 235**	**2 151**
Profit II.	HUF/hectare	22 509	40 009	39 979	37 399	37 315
2005						
Revenue	HUF/hectare	98 982	117 072	123 845	130 025	153 278
Direct Payment	HUF/hectare	39 424	39 424	39 424	39 424	39 424
Production Value	HUF/hectare	138 406	156 496	163 269	169 449	192 702
Total Production Cost	HUF/hectare	116 103	116 716	123 792	132 902	157 172
Profit I.	HUF/hectare	**-17 120**	**356**	**53**	**-2 876**	**-3 894**
Profit II.	HUF/hectare	22 304	39 780	39 477	36 548	35 530
2006						
Revenue	HUF/hectare	98 982	117 072	123 845	130 025	153 278
Direct Payment	HUF/hectare	42 535	42 535	42 535	42 535	42 535
Production Value	HUF/hectare	141 517	159 607	166 380	172 560	195 813
Total Production Cost	HUF/hectare	120 747	121 385	128 744	138 218	163 459
Profit I.	HUF/hectare	**-21 765**	**-4 313**	**-4 898**	**-8 193**	**-10 181**
Profit II.	HUF/hectare	20 771	38 222	37 637	34 343	32 354
2007						
Revenue	HUF/hectare	98 982	117 072	123 845	130 025	153 278
Direct Payment	HUF/hectare	45 807	45 807	45 807	45 807	45 807
Production Value	HUF/hectare	144 789	162 879	169 652	175 832	199 085
Total Production Cost	HUF/hectare	125 577	126 240	133 893	143 747	169 997
Profit I.	HUF/hectare	**-26 594**	**-9 168**	**-10 048**	**-13 721**	**-16 719**
Profit II.	HUF/hectare	19 213	36 639	35 759	32 086	29 088

Source: own calculation on the basis of test farms survey of Institute of Agricultural Research and Informatics

- When making the calculations for the year 2004 to 2007 I made my investigations with the purchase price, but offering the surpluses for the intervention is not an accepted opportunity. We cannot count on this solution for a long run, as this is proved by my forecast.
- I find cultivating alternative crops (such as spelt, energy grass, energy plantation, amarant, etc.) a reasonable solution in order to maintain and improve the profit gaining ability of farmers cultivating under less favoured areas. This is proved by keeping up with the guidelines of sustainable development, preserving landscape and

enforcing aspects of environmental conservation. This may only be realized with the help of subsidies.

Table 5.

The Forecast Cost and Profit Relation of Corn Production for the Years 2004 to 2007 in Joint Ventures Producing Crop for Market, on the Basis of Land Quality

Denomination	Unit	Land Quality (AK per hectare)				
		<15,0	15,01-20,00	20,01-25,00	25,01-30,00	>30,01
Average Yield	**t/hectare**	**5,41**	**5,86**	**6,84**	**7,86**	**9,42**
Average Marketing Price	**HUF/t**	**24 720**	**24 720**	**24 720**	**24 720**	**24 720**
		2004				
Revenue	HUF/hectare	133 745	144 737	169 124	194 296	232 769
Direct Payment	HUF/hectare	35 164	35 164	35 164	35 164	35 164
Production Value	HUF/hectare	168 909	179 901	204 289	229 461	267 933
Total Production Cost	HUF/hectare	140 700	142 534	151 753	171 107	177 830
Profit I.	HUF/hectare	**-6 955**	**2 203**	**17 372**	**23 189**	**54 939**
Profit II.	HUF/hectare	28 210	37 367	52 536	58 353	90 103
		2005				
Revenue	HUF/hectare	133 745	144 737	169 124	194 296	232 769
Direct Payment	HUF/hectare	39 424	39 424	39 424	39 424	39 424
Production Value	HUF/hectare	173 169	184 161	208 548	233 720	272 193
Total Production Cost	HUF/hectare	146 328	148 235	157 823	177 952	184 943
Profit I.	HUF/hectare	**-12 583**	**-3 498**	**11 301**	**16 345**	**47 826**
Profit II.	HUF/hectare	26 841	35 926	50 726	55 769	87 250
		2006				
Revenue	HUF/hectare	133 745	144 737	169 124	194 296	232 769
Direct Payment	HUF/hectare	42 535	42 535	42 535	42 535	42 535
Production Value	HUF/hectare	176 280	187 272	211 659	236 831	275 304
Total Production Cost	HUF/hectare	152 181	154 164	164 136	185 070	192 341
Profit I.	HUF/hectare	**-18 436**	**-9 428**	**4 989**	**9 227**	**40 428**
Profit II.	HUF/hectare	24 099	33 107	47 524	51 762	82 963
		2007				
Revenue	HUF/hectare	133 745	144 737	169 124	194 296	232 769
Direct Payment	HUF/hectare	45 807	45 807	45 807	45 807	45 807
Production Value	HUF/hectare	179 552	190 544	214 931	240 103	278 576
Total Production Cost	HUF/hectare	158 268	160 331	170 701	192 472	200 034
Profit I.	HUF/hectare	**-24 523**	**-15 594**	**-1 577**	**1 824**	**32 734**
Profit II.	HUF/hectare	21 284	30 213	44 230	47 631	78 541

Source: own calculation on the basis of test farms survey of Institute of Agricultural Research and Informatics

In my opinion, the basis of a cereal conception investigating the situation of cereal production in correlation with crop production and animal breeding may be the followings:

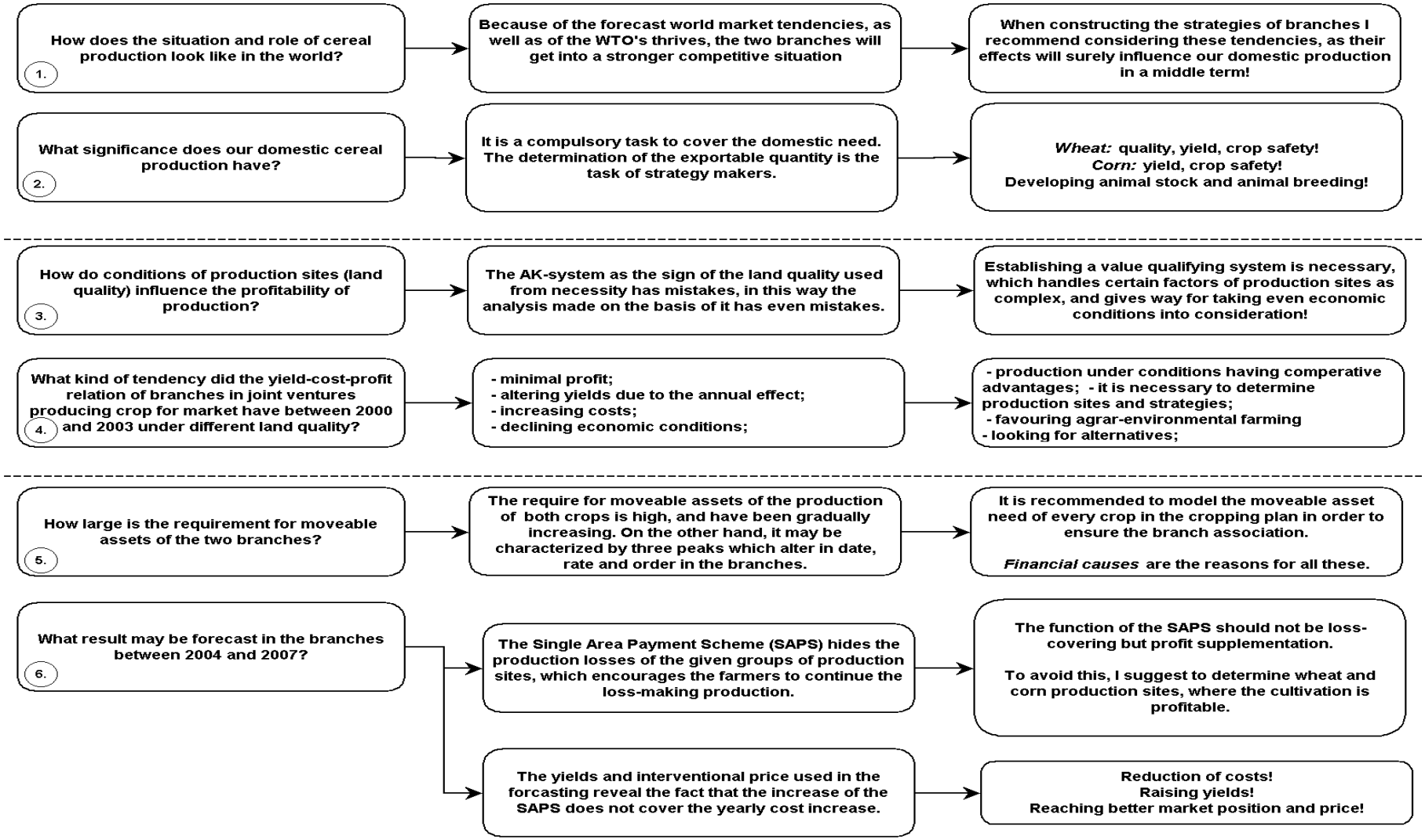
- *Restructuring the cropping structure* of crop production (e.g. establishing production quotas differing on the basis of conditions of production sites,

encouraging to cultivate alternative crops, informing farmers, extension work). This naturally goes with *the reduction of cropping area of cereals*.

- Only administrative tools may not determine the reduction of cropping area of cereals, but a cautiously structured *subsidy system* may help in this.
- It is vital to establish the conditions for economic and efficient production. In order to reach this, the farms should strive *to concentrate* wheat and corn production (mainly the last one) to suitable land area having *comparative advantages*.
- One should endeavor to produce crop meeting with high *demands* (especially relating to wheat) on the reduced area. It is an unambiguous aim *to raise yields in corn*.
- It is vital to assist *the operation of product* chain without interest contrasts.
- The sustainable agriculture operating in the European Union should be strengthened in practice, as well as the introduction of *agrar-environment* and *subsidies* aiming at traditional, low input farming methods.
- The *technology* in the given territory (landscape, subregion) should be harmonized with *the conditions of production sites* (variety, verified seed, fertilizer, plant protection, up-to-date machinery techniques, reasonable used technology).
- It is not enough to produce a product of good quality, we have to convince the potential consumers that our products are good. One of the conditions of the market success in the cereal chain is the utilised *marketing activity*, especially if we would like to sell the product on a good price in the market.
- It is essential to make the present institute system more practical and be able to operate in a more efficient way (establishing local units dealing with certain functions of the financing agency).

The most important conclusions and recommendations are summarised in Figure 5.

Figure 5. **The Most Important Conclusions and Recommendations of the Dissertation**



Source: own constructed figure (2005)

NEW FINDINGS OF THE DISSERTATION

❶ I investigated the production data of joint ventures producing crop for market according to the new data structure utilised in the EU. ***I highlighted the correlations between the cost types necessary for my branch economic calculations and the cost indicators registered in the test farm system.***

❷ I carried out my qualifying work on the basis of the AK system. Utilising this was a constraint as the activity aiming at renewing the land qualification stopped at the change of regime. Though my results prove my conclusions, I think, the establishment of the new land qualifying system is essential. ***Despite the deficiency of the AK system my calculations justify the fact that the land quality in AK influences the reachable profit in both branches using different technologies.***

❸ ***Analysing the production of certain farms according to land quality, reveals the fact that a better distribution of cropping area may help in exploring reserves without raising expenses: the average yield may be increased, cost may be rationalized, the branch profitability may be improved.***

To reach the highest profit on national economic level, we have to evaluate the role of certain crop production branches in different production sites, moreover, crops which are and may be cultivated by conventional way should be economic analysed.

To my mind, one of the conditions of improving our competitiveness is ***to determine the basis area for wheat and corn production with respect to the production sites***, the area where the given crop may be cultivated successfully (at least by reaching minimal profit). This is necessary in order to use up the single area payment for the crop in accordance with its aim that is to supplement the profit.

It must be highlighted that what kind of crops may be cultivated profitable in these areas (special products, e.g. herbs, crops for spices, asparagus, plantations, vine, etc.) Further alternative may be selecting, changing the production technology (e.g. eco-production), by which the cultivation of the given crop may be profitable. Withdrawing areas from production permanently may be a solution (e.g. preserved area, forest) and withdrawing partially (e.g. energy forest), and its special utilizing method (production of energy grass) as well.

- ***The forecasting in my dissertation reveals the fact that in case of certain natural conditions (appearing in AK-value in my analysis) the amount of the single area payment compensates the losses under the present economic situation.***
- ***The systemic problems handling, expanding the examined correlations, AK-based investigations and the utilised methods show the new side of this topic.***

Besides the economic significance of the branch, the new situation caused by the EU accession, as well as the production experience of 2004 give reasons for the actuality of the chosen topic.

UTILISATION OF RESULTS IN PRACTICE

The results of my research may help in determining branch strategies on national economic level. It gives directions for defining the importance and opportunities of the domestic cereal production (wheat and corn) within the agriculture considering the present cost-profit relations, the regulations and subsidies of the European Union and world market tendencies. The analysis made in the dissertation, as well as the conclusions give guidelines for farmers and branch leaders under a given conditions of production sites indirectly, through the strategy. My results and conclusions may be utilized in education, research and extension work.

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