DIFFERENCES BETWEEN ORGANIC AND CONVENTIONAL FARMING SYSTEMS IN THECZECH REPUBLIC

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Agriculture of the Czech Republic has features of submonate and montane agriculture. More than half of the surface of the Czech Republic is less favourable areas (LFA). Active state support of farming focused on the extensive production and maintenance of the countryside and the other environmental services is the crucial point of a successful development of competitive and economical (from the point of view of the environment) production in LFA. Organic farming is carried out on the area of 6 % of the surface of agricultural land, most of agricultural land is worked with conventional methods of farming. In the Czech Republic there are significant differences between structure of the organic and conventional farming, especially in the share of arable land and share of permanent grasslands. The differences between organic and conventional farming systems can be located also in structure of production and in some other parameters (average acreage of the farms…). The contemporary state of farming has been evaluated and organic and conventional farming systems have been compared in the framework of the analysis of structure of farming in the Czech Republic. The selective group of 437 associations was divided into three different subgroups, and into several categories according to the farming method and altitude. Parameters of plant and animal production and use of the agroenvironmental programmes and measures are evaluated. The evaluation of the structure of farming permits to find optimal possibilities of future development of conventional and organic farming in the Czech Republic and of arrangements of the settings of grants and subsidies.

***Keywords**: Organic farming, farming structure, plant production, farming systems, sustainable farming.*

Contemporary differences between the organic and conventional farming is based on situation in years after the World War Two in fact. During that time the Czech agriculture rapidly changed when the state border area had been locked up after year 1948. This step significantly restrained farming in these areas. Also the rest of agricultural land had been very adversely affected by demonstrative land consolidation into large fields which led to environmentally worth ecosystems

elimination and landscape structure simplification and landscape heterogeneity reduction (Sklenička, 2003). In that time generally without relation to the environmental conditions the share of grain crops dramatically raised over 50 %. Maize as the main fodder crop began to be used substituting clover crops and clovergrasses, permanent grasslands was predominantly changed into arable land. This trend led to field area enlargement, ignorance of soil erosion measurements and reducing the share of free landscape verdure (Kender, 2004).

Extensive changes proceeded in the animal production as well. In the fifties the animal production begun to concentrate into specialized high-capacity units replacing then individually spread farms. Higher concentration of livestock in one place caused contamination of soil and water even when grazed. In places with periodical animal migration and concentration content of nitrogen in soil increased several times and caused expansion of weedery. While in the inaccessible areas for heavy machinery escalated bushes frequency in periodically harvested and fertilized by mineral fertilizers areas the landscape greenery and its species diversity rapidly decreased (Kroupová, Suchý, 1992). As a resulting effect of mentioned processes was destruction of the environmentally worth ecosystems causing lower biological and production potential of the landscape combined with soil erosion exposure. (Sklenička 2003, Anonymus 1, 2006).

Such a state had continued until year 1990 when ownership of land changed thanks to land reversion to the original owners which led to re-creation of smaller farms. Just some of those farms as the first begun with implementation of organic farming. Unfortunately because of stopped national subventions in years 1993 – 1997 organic farming has more intensively developed during last decade. Although the organic and conventional farming in the Czech Republic differ in many ways restructuralization of private farming on land has still been insufficient. Meaning of the environmentally friendly farming in low productive areas is crucial (Hampicke, Liptersky, Wichtmann, 2005), therefore there must be respected proper agronomical practices, rotation of crops (Vrkoč, Vach, 1995), share of perennial plant (Šroller, Novák, 2000), use of suitable indigenous plant species (Samsonová, Šarapatka, Urban, 2005) and application of biological and agrotechnical methods of plant growths protection. Also the organic farming must be economically effective despite of the production losses. The subventions programmes achieve this.

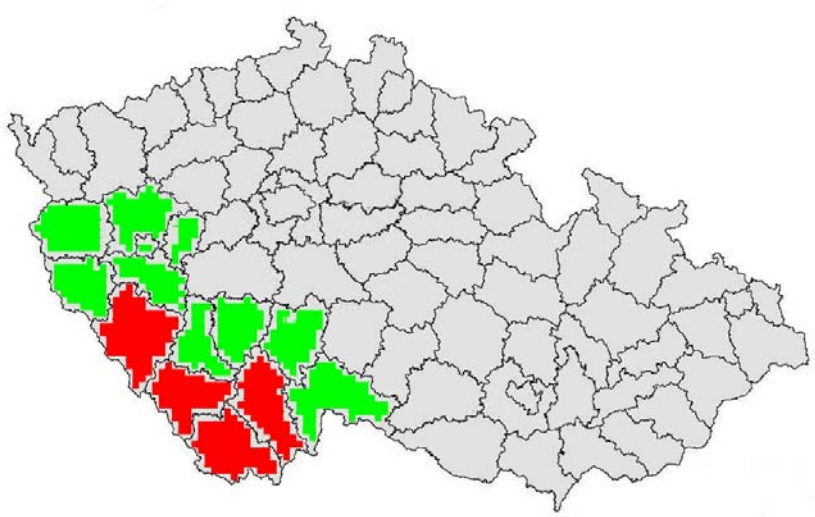
MATERIAL A METHODS

Data used for the analysis of structure of the conventionally and organically farming subjects were collected by means of question-forms and directed interview. Basic schema of the question-form research was based on specially oriented research project of the Sixth framework programme carried out by the Research Institute of Agricultural Economics Prague and national institute INRA – ESR in Rennes for the European Commission to study the institutionary aspects of the agroenvironmental programmes implementation and was expanded by the mentioned question-forms. The main questionnaire research has monitored situation in the whole Czech Republic (file I), the forms has consequentially helped to monitor situation in the South Bohemia and

in the Pilsner region (south and west of the Czech Republic – file III) and in counties Klatovy, Prachatice, Český Krumlov (south of the CR – soubor II). File distribution shows map in Fig. 1.

Within the framework of question-form research were contacted more than 2500 agricultural subjects in different areas of the Czech Republic, the percentage of successfully returned and answered forms was 18 %. The obtained database was analyzed for preparation of information file related to farming way (conventional, organic), plant production and animal production structure and general evaluation of the level and way of environmental friendly practices within the frame of agroenvironmental programmes and measures. Besides these factors the questionnaire research monitored number of additional facts as well. For the choice of testing parameters the accent was put on their informative value and mutual comparability of the testing files.

Fig. 1 – Testing file distribution



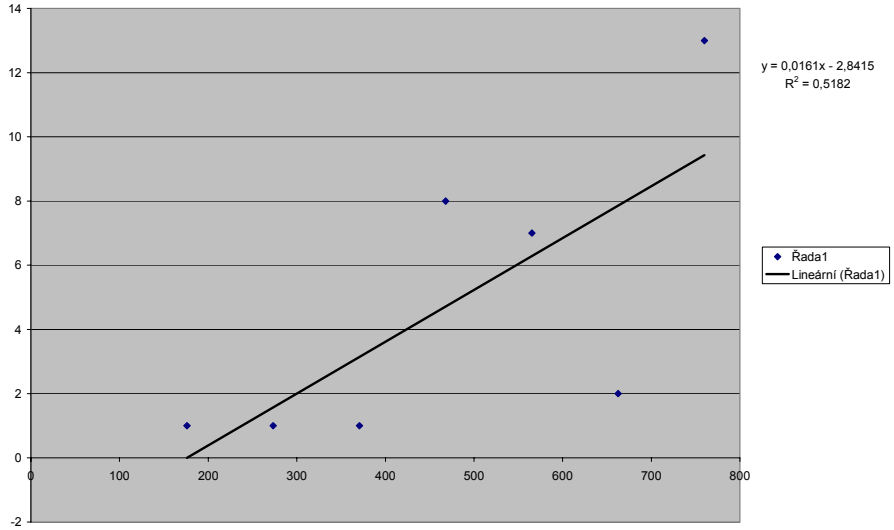
White - Czech Republic (file I)
Red - counties Klatovy, Prachatice, Český Krumlov (file II)
Green - South Bohemia and Pilsner region (file III)

RESULTS AND DISCUSSIONS

Allocation of conventional and organic farming systems in relation to altitude

In the Czech Republic the share of organic farming makes approximately 6 % of the whole agricultural land, on most of the land conventional farming system is applied. The number of organic farms and the area under organic cultivation increases with rising altitude. In the productive regions of the Czech Republic the share of organic farming is minimal. While in areas with elevation of 400 m above see level makes the share of organically farming subjects 4%, in elevation of 700 m above see level it represents nearly 30 %. The step difference in elevation of 650 m above sees level results from the marginality line and related economical efficiency of conventional farming producing common commodities. In the mountain LFA

regions the non-productive environmental function is relatively carried out. Also Střeleček (2002) mentions that the conversion to the desirable extensive farming in the marginal areas leads to higher production quality and ecological production at all. On the other hand the production function of organic farming is significantly suppressed which results in very insufficient delivery of bioproducts on the market intensified by poor range of this assortment. In relation to altitude the number of conventionally farming subjects decreases, although this farming system markedly outweighs the organic farming in all elevations.



Diag. 1. **The relation between altitude and number of organically farming subjects within chosen file of subjects in the Czech Republic**

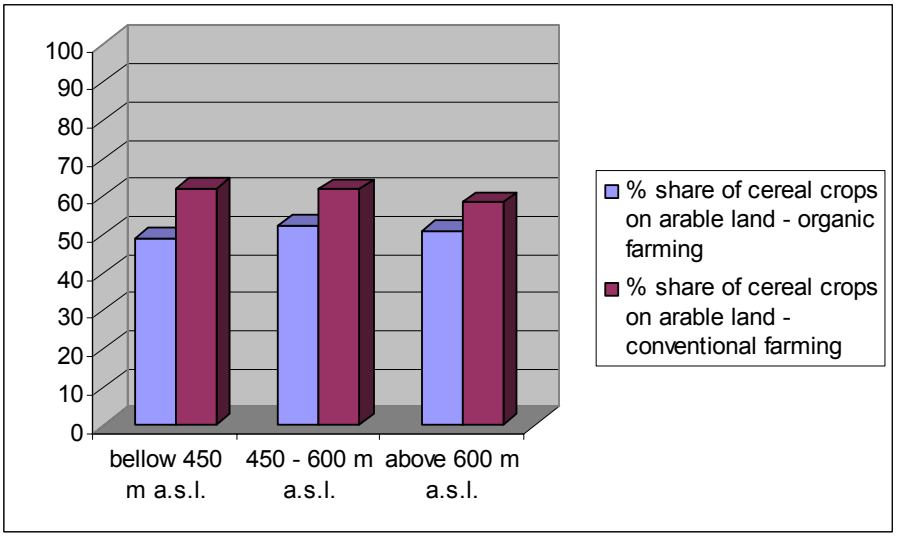
Farms selection

Structure of farming subjects as far as the area of cultivated land is concerned features strict dual characteristic. A great number of small farms fall on very minor area of cultivated land – 70% of all the subjects cover 2,3 % of the whole agricultural land and conversely large companies (2,1 % of all the subjects only) cover almost 60 % of the cultivated area. An average area under cultivation per farm expressed using the arithmetic average makes 71 ha. However when used the weighted arithmetic average to take into account the difference in area under cultivation of particular groups of farms the result shows much higher area of 1507 ha. This duality appears more significantly by conventional farms, because only few of organic farms manage larger areas of land.

Smallest farms cultivate areas of hectares (the smallest conventional farm manage area of 2,94 ha, the smallest organic farm cultivates area of mere 0,2 ha. Largest subjects manage areas of thousands hectares (largest organic farm - 2342,44 ha, largest conventional farm - 5245,00.

Structure of plant production

In general the structure of plant production completely differs when compared organic and conventional farming. Since the last half a century conventional farming has not been transformed much, structure of organic farms developed in nineties is markedly different. The process of organic farming principles implementation respectively conversion to organic farming according to organic farming law 242/2000 Sb., and Regulation EK 2092/91 has not passed gradually but farms with production on arable land completely focused their activities onto farming on grasslands with consequential clearance sale of machinery and technologies for farming on arable land. This change also led to reduction of milk production and to non-milk beef-raising trend. In most of cases contemporary organic farming means farming on grasslands with great reduction of production on arable land. The share of grasslands by organic farms makes 93,56%, while only 25,95% by conventionally farming subjects. Percentual share of grassed areas in the Czech Republic increases to targeted 37% of grasslands which corresponds to results by Penk (2001), who considers current share of grassland to be still insufficient. High percentage of grassed areas by organic farms results from grants scheme (Moudrý, Friebelová, 2006), which motivates farms to complete grassing without respect to elevation of their area.



Graf. 2. **Share of cereal crops on arable land by the conventional and organic enterprises in the Czech Republic**

Great difference between conventional and organic farming systems can be found when compared area of arable land. While conventional farms manage on average 74,7% share of arable land, organic farming exploits 8,1% only.

Rotation of crop features very similar trends in both systems. Dominant share represent in both systems cereal crops, in production areas the share of cereal crops makes 62,0%, in transition regions (450-600 m above see level) 61,1% and in regions over 600 m it makes 58,2%. High percentage of cereal crops results from

reduced areas of fodder crops on arable land in consequence of low numbers of cattle. Highest share among cereal crops represents wheat - 26,42%, other important species are oat (23,04%), barley (21,17%) and rye (19,54%). Lower rates represent triticale (5,73%) and spelt (4,11%).

Certain dissimilarity between organic and conventional farming is evident in relation to oil plant cultivation. Conventional farms relocated the majority of rape production into areas with lower elevation. In elevations up to 600 m above see level the rate of oil plants within a crop rotation represents c. 16,5% and the most common plant is rape, which is totally absent in crop rotations used by the organic farms.

All of the monitored farms do not practically grow legumes on arable land (minor percentage of 1,52%). The share of legumes (leguminous plants and clover plants) on arable land fall short of their importance in crop rotations intended for organic farming. Low rates also fall on potatoes that represent the mere percentage of 1,23% against the optimal rate of 5% presented by Penk (2001).

Currently used crop rotations within the both farming systems feature very low numbers of used species and extremely high share of grain crops. Wheat before all is the less optimal species from the environmental point of view. This fact corresponds to theses concluded by Kvapilík (1999), Šimon (1996), Moudrého, Strašila (1999) and others, who state that diversity of plant production in montane regions should be extended using wider range of traditional and unconventional crop species.

Structure of livestock production

If focused on livestock production there are several contrast evident between organic and conventional farming. Besides the differences resulting from the organic farming law 242/2000 Sb. there appears evident distinction in animal husbandry trend. While conventional farms focus on commercial milk production (10% only by organic farming), organic farms target the meat breeds for non-milk cattle production.

Organic farming specialization in cattle breeding without commercial milk production results from current grant conditions that implicate minimal livestock loads on land. Therefore the pasture cattle breed means the most efficient way from the economic point of view for organic farms. This fact result in 90 % share of bio-beef within the total bioproduction in the Czech Republic. Moreover most of this production is sold as a conventionally produced beef because of insufficient bio-beef processing capacities. Different situation shows with other kinds of farm animals. Organic farms specialize in sheep and goat breeding. Pig and poultry breeding is practically missing, which flow from high-capacity conventional production out of arable land farming being applied in the recent past, this state has still been lasting. According to environmental principles these businesses are not suitable before all the high-kapacity pig plants with possible load up to 8 livestock units/ha. An average load in the monitored files of farms reach 0,44 livestock unit/ha, particular farms reach values 0-2 livestock units/ha.

CONCLUSIONS

In the Czech Republic the restructuralization of farming has not sufficiently passed yet. Even for organic farm the dominant purpose for their activities consist the only economic prosperity, which in connection with grant scheme leads to nearly complete grassing agricultural land without regards to the type of production region and altitude.

Conventionally farming subject are motivated to grass land partially only which results in insufficient rate of grasslands in regions with higher elevation. Crop rotations feature very poor diversity of crops with very high rates of cereal crops regardless concrete farming principles at all.

Due to current grant scheme organic farming has differentiated from the conventional way of farming significantly in the mountain and submountain regions thanks to high rates of grassed areas that helps to fulfil its environmental function.

However its production function has been rapidly reduced which is reflected for example in narrow range of bioproduction. Future aims of the grant scheme should be focused on support of organic farming areas expansion.

However in production regions and submountain regions partially should be oriented on arable land by means of crop rotation diversification instead of further grassing.

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