

## ECOLOGICAL FARMING IN LITHUANIA

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### Abstract

The article analyses distribution of ecological farms in Lithuania and their specialization. Ecological farming in Lithuania has been practiced since 1993, when only nine ecological farms were certified. At present ecological farming is becoming more and more popular, the number of such farms is increasing every year, which is influenced by financial EU and state support for the development of ecological agriculture. In 2003 were certified 700 ecological farms, while in 2009 – almost four times more than in 2003 (2733 ecological farms). However, ecological farms comprise only 2.6 percent from the total number of registered farms. Ecological farming is practiced mostly on an area of up to 30 ha of agricultural land. Such farms in 2007 made up 65 percent of all certified ecological farms. Most farms practice mixed production, although prevails growing of crops, the least is the number of farms engaged in ecological livestock and herb production. Having calculated specialization coefficient, it was found that from 2005 to 2008 ecological farms were averagely specialized, as coefficients in the studied period range between 0.35 and 0.48. Among ecological crops in Lithuania dominate grains and legumes.

**Keywords:** ecological farming, farms, specialization, land use.

### Introduction

At the beginning of 1980s the idea of ecological farming began to spread all over the world. Alternatives to traditional farming were impelled by an increasing environmental concern, rural economic and social, as well as health problems.

In Lithuania the movement towards ecological agriculture started in 1990, when Lithuanian Ecological Agriculture Association “Gaja” was founded, which after a year joined the International Federation of Organic Agriculture (IFOAM International Federation of Organic Agriculture Movements). This public organization regulated the standards and certification criteria of ecological agriculture (Pažemeckas, 2006).

Ecological farming is an alternative to traditional farming and is a constituent part of sustainable farming system (Maskoliūnaitė, 2004). Ecological farms reject synthetic mineral fertilizers and pesticides: all nutrients required by plants are obtained from natural organic sources, applying crop rotation, pests and diseases are destroyed using natural organic substances and methods.

Ecological farming allows to conserve and attain a long-term improvement of soil fertility, to protect environment against pollution, to produce high quality agricultural output which is greatly valued among today's consumers.

In 2006, the scientists of the Lithuanian Agrarian Economics Institute have done a research to ascertain the main factors stimulating ecological farming in Lithuania. Such a study was one of the first attempts to determine the reasons and motives of the development of ecological farming. The study has shown that the main factors stimulating the choice of this method of farming is market expansion of ecological products, support to ecological farming, environmental factors. It is sought to restrict the growing and distribution of genetically modified plants in Lithuanian farms (Skulskis et al., 2006). The researchers of the Lithuanian Agricultural University have compared the traditional and sustainable farming. In the provided conclusions it is underlined that, although ecological farming ensures food safety and better life quality, only a small portion of farmers choose ecological farming. The principal reasons of this are much more complicated scientific and production means used for fertilization and plant protection as compared to chemical ones. One of the means to stimulate ecological farming are higher compensatory payments in comparison to traditional farming (Čiulevičius et al., 2007).

Although the number of ecological farms in Lithuania and certified land areas is increasing, however, factors affecting the development of ecological farming in the country haven't been systematically studied and analysed in scientific literature.

The aim of the study – to analyse and evaluate land use in ecological farms. For the purpose the following objectives were set:

- to determine and assess the distribution of ecological farms in Lithuania;
- to analyse the specialization of ecological farms.

Study object – ecological farms. To evaluate the distribution of ecological farms, the methods of analysis and comparison were applied. The data were expressed in percentage ratio, statistical tables were worked out. For the study the research works of Lithuanian authors as well as the results of conducted studies were used. Advantage was taken also of the information provided by the Ministry of Agriculture of the Lithuanian Republic, National Payment Agency at the Ministry of Agriculture and Agricultural Information and Rural Business Centre. In the study statistical data of the Public Institution „Ekoagros“ on the number and areas of ecological farms in Lithuania were used.

The study analyses the activities of ecological farms, rational land use, as well as some more important peculiarities and factors of ecological farming, which to a major extent precondition successful farming.

### Results

Parrott, Olesen and Høgh Jensen (2006) have singled out the following main groups of factors stimulating ecological farming:

- unwillingness or a certain fear to risk – agricultural production is closely related to weather conditions;
- health – ecological products are healthier, workers in the crop growing process avoid contact with chemical substances and their impact;
- environment conservation – soil erosion is reduced, increases the quality of drinking water;
- improved biodiversity – it allows to increase and prolong natural soil productivity.

To ensure sustainable development of ecological farms in Lithuania, researchers have analysed promotion of such farming by providing support to ecological farms (Jasinskas J., Kazakevičius Z., 2008). The authors have evaluated the impact of support on sustainable farming and its development. The most efficient measure turned out to be payments for certified areas used in the production of agricultural and food products. It is also stated that investment support is not efficient and there even doesn't exist a special investment program for ecological farming, thus it is necessary to improve the order of support provision to stimulate ecological farming. Application of taxes for selecting the traditional farming and raising of the prestige of ecological farms by paying higher price for ecological products on the market could be some means of encouragement.

To raise the competitiveness of ecological farming, J.Ramanauskienė and M.Arys (2009) suggest the following measures: more emphasis on the ecological origin of product; propagation of ecological farming; improvement of statistical data base on ecological farming; creation of competitive marketing system of ecological products; development of multipurpose agriculture; regulation of ecological farming; food safety and quality; modernization of ecological farms and implementation of innovations; improvement of information and education systems. All this would provide better prerequisites for ecological farming.

The general agricultural policy in the European Union is more and more oriented towards ecological farming which provides both environmental and socio-economical benefits, corresponding to the requirements of sustainable development. Its rapid development was preconditioned not only by the interest of consumers in the safety of food products, but also by mankind's concern with environmental quality, stable and balanced further development of the economy. The number of ecological farmers is growing in Lithuania as well. This is a new sphere, which started developing in Lithuania since 1993, when only 9 ecological farms were certified, providing 148 ha of land for this purpose (Jasinskas J., Kazakevičius Z., 2008).

At present the popularity of ecological farming is growing, the number of ecological farms increases every year. In 2003 only 700 ecological farms were certified, while in 2009 – 2733, i.e. almost four times more than in 2003 (Table 1).

In Lithuania the number of ecological farms was growing rapidly, with their numbers increasing on an average at 40 percent per year, i.e. by 537 farms annually. In Lithuania, from 2003 to 2009 the number was increasing on an average by 339 ecological farms annually, i.e. their number used to augment by 28 percent. The greatest number of ecological farms in the analysed period was in the southeastern part of Lithuania (Vilnius region).

In general, it may be stated that in 2003 – 2009 the number of ecological farms in Lithuania had a tendency to increase on an average by 28 percent. The highest growth of the number of farms was

from 2004 to 2007, while the main reason of this was increasing financial EU and state support for the development of ecological farming.

**Table 1**

Number of ecological farms and its changes in Lithuania

| Year          | Number of farms | Number shift     |              | Number shift in percent |              |
|---------------|-----------------|------------------|--------------|-------------------------|--------------|
|               |                 | from the initial | intermediate | from the initial        | intermediate |
| 2003          | 700             |                  |              | 100                     |              |
| 2004          | 1178            | 478              | 478          | 68,3                    | 68,3         |
| 2005          | 1811            | 1111             | 633          | 2,59 k.                 | 53,7         |
| 2006          | 2348            | 1648             | 537          | 3,35 k.                 | 29,7         |
| 2007          | 2848            | 2148             | 500          | 4,07 k.                 | 21,3         |
| 2008          | 2792            | 2092             | -56          | 3,99 k.                 | -2,0         |
| 2009          | 2733            | 2033             | -59          | 3,90 k.                 | -2,1         |
| On an average |                 |                  | 338,8        |                         | 28,15        |

*Information source: Public Institution „Ekoagros”*

In Lithuania, in 2008 the total number of registered farms comprised 108312, while in 2009 – 107068 farms. Ecological farms made up only 2.6 percent from the total number of registered farms (Table 2).

**Table 2**

Farms registered in the farmers' register in 2008 – 2009

| Registered farms | 2008   |         | 2009   |         |
|------------------|--------|---------|--------|---------|
|                  | number | percent | number | percent |
| Ecological farms | 2792   | 2,58    | 2733   | 2,55    |
| Farms            | 105520 | 97,42   | 104335 | 97,45   |
| Total:           | 108312 | 100,00  | 107068 | 100,00  |

*Information source: Land fund of the Lithuanian Republic. National Land Service; Public Institution “Ekoagros”*

In France ecological farms comprise 3.2% of all farms in the country. In 2009, 2.5% of land allocated for ecological production from the total area of agricultural land in France were certified. Total land area for ecological farming in Germany comprised 5.6% from the whole arable land. Certified farms made up 5.9% of all farms in Germany. In 2009, the area of certified ecological farms comprised about 3.7 percent from the total area of Lithuanian agricultural land, while in 2003 certified area made up only 0.7 percent from the total agricultural land area. Thus, certified ecological area has been increasing every year, however, prevail small farms.

In 2007, most ecological farming was practiced on land area of up to 30 ha. Such farms amounted to 1838, comprising 65 percent from all certified ecological farms. Their land area amounted to 19 percent of all certified agricultural land area (Table 3).

**Table 3**

Ecological farms by used land area in 2007

| Farms  | from 0 to 30 ha | from 31 to 50 ha | from 51 to 100 ha | from 101 to 200 ha | from 201 to 300 ha | from 301 to 500 ha | from 501 to 940 ha | Total:    |
|--------|-----------------|------------------|-------------------|--------------------|--------------------|--------------------|--------------------|-----------|
| number | 1838            | 390              | 326               | 208                | 44                 | 30                 | 12                 | 2848      |
| area   | 22879,42        | 15654,34         | 19266,88          | 24083,6            | 14450,16           | 13245,98           | 10837,62           | 120418,00 |

*Information source: Public Institution „Ekoagros”*

Farms, the area of which was from 31 to 50 ha, comprised 14 percent from the number of ecological ones, while the area of arable land – 13 percent from the total certified ecological area. Farms of 51 ha and bigger made up 21 percent, while their area – 32 percent. In this group were 12 large farms, the area of each of which exceeded 500 ha. The largest farm – 941 ha.

Certified area has been increasing every year. In Lithuania average certified area of one farm from 2001 to 2009 augmented even by 25.21 ha. In 2001, certified area covered 6469 ha, while average certified area of an ecological farm – 22.08 ha, in 2009 – 129787 ha (47.49 ha) (Table 4).

**Table 4**

Certified area and number of farms in Lithuania in 2001 – 2009

| Year | Certified area in ha | Number of certified farms | Size of average farm, ha |
|------|----------------------|---------------------------|--------------------------|
| 2001 | 6469                 | 293                       | 22,08                    |
| 2002 | 8780                 | 393                       | 22,34                    |
| 2003 | 23289                | 700                       | 33,27                    |
| 2004 | 42982                | 1178                      | 36,49                    |
| 2005 | 69430                | 1811                      | 38,34                    |
| 2006 | 102121               | 2348                      | 43,49                    |
| 2007 | 120418               | 2848                      | 42,28                    |
| 2008 | 122194               | 2792                      | 43,77                    |
| 2009 | 129787               | 2733                      | 47,49                    |

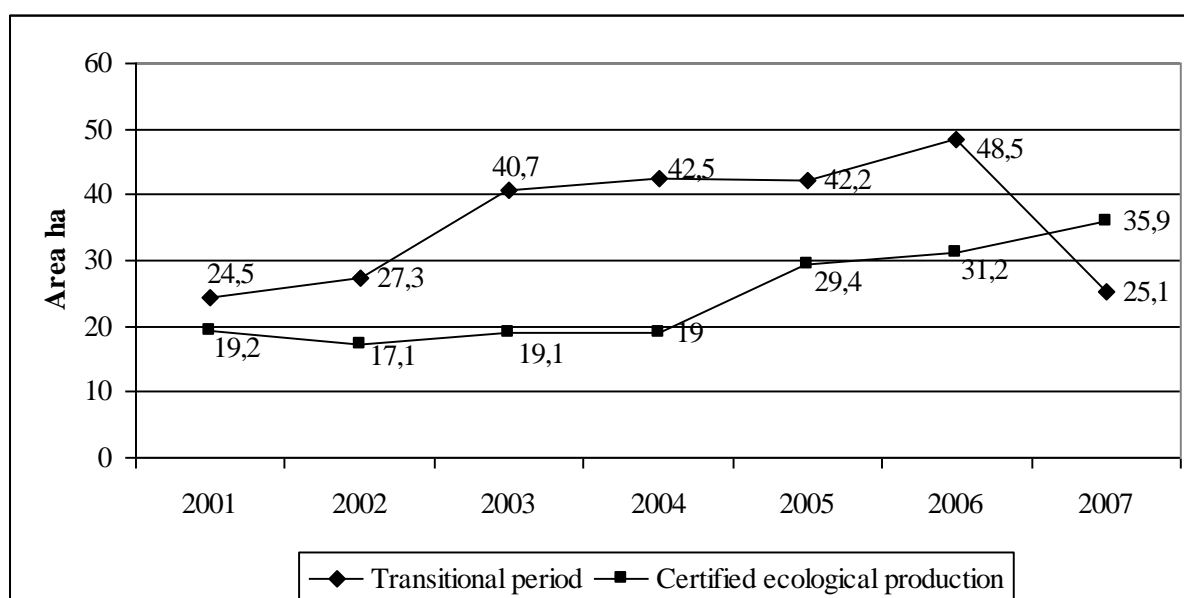
*Information source: Public Institution „Ekoagros”*

It can be seen that in 2007, as compared to 2008, ecological farms were enlarging, as under reduced number their area amounted to 1,776 ha, while average size of a certified farm augmented up to 43.77 ha. In 2009, average farm size was even 47.5 ha. In 2009, as compared to 2003, certified ecological production area increased by 5.6 times. The greatest changes in certified areas were recorded in 2004, when in comparison to 2003, they augmented even by 84.6 percent, i.e. by 19693 ha. On an average, areas of certified ecological production in Lithuania in the analysed period used to increase by 36.5 percent, i.e. 17756,3 ha annually.

Ecological production method is a totally new agricultural system, therefore, transition from traditional to ecological production method requires compliance to the rules set by international institutions, defining the transition period. This transition is done either in the whole farm or in its part, if the owner takes a written responsibility that the whole farm will be subjected to ecological production over a period of five years. Concerning the portion of ecological farming, a separate activities journal of a certain form set by the order of the Minister of Agriculture of the LR is filled. As the system of ecological farming is very complicated and requiring many changes, thus a transition period from 2 to 3 years is foreseen. This transition period depends on the grown crops, while certification institution may prolong this period or shorten it taking into account former farming method and environmental conditions (Danilčenko, Jarienė, Rutkovienė, 2004).

Average area of certified and transitional period farms in Lithuania was increasing and up to the year 2006 the area of transitional period farms was almost by 1/3 bigger than that of ecological farms. However, in 2007 the size of a transitional period farm decreased even by 43 percent, as compared to an ecological farm (Fig.1).

Rapid expansion of the area of ecological farming is preconditioned by financial support and demand on ecological products. Technological differences in ecological and traditional farming reveal the essence of ecological agriculture. Ecological farming covers all systems of agriculture. It also cherishes the environment, social, economic, ecological full-fledgedness of food and industrial produce. This system is based on soil viability, genetic inheritability of plants, animals and the landscape (Tolstošejeva, 2007).



**Fig.1.** Average size of certified ecological production and transitional period farms in 2001-2007 m.

Choosing farm specialization, it is necessary to take into account local conditions, i.e. soil, terrain, climate and perspective for certain regions specialization. In the western zone, eastern highlands and southeastern Lithuania most attention should be paid to dairy and meat cattle, while in the central part - to crop production and its combinations with livestock. The trend of farming shouldn't cause environmental problems.

According to the data of respondent farms, average ecological farm size in 2008 was 42,13 ha. In the agricultural land structure of ecological farms the highest portion comprises arable land – about 80.2 percent, meadows and pastureland – 9.9 percent, orchards about 1.4 percent, forests about 3.4 percent, while the rest land about 5.1 percent. In the arable land mostly grain crops are grown (58 percent). Annual and perennial grasses take about 34 percent, fallow land – 5.3 percent, potatoes and field vegetables – 1 percent.

The most numerous are ecological farms of mixed production, although prevail crops, the least is the number of farms engaged in ecological livestock and medicinal herb production (Table 5).

**Table 5**

The structure of ecological farms

| Specialization                           | Number of farms in different years |             |             |             | Percent in different years |            |            |            |
|--|------------------------------------|-------------|-------------|-------------|----------------------------|------------|------------|------------|
|  | 2005                               | 2006        | 2007        | 2008        | 2005                       | 2006       | 2007       | 2008       |
| 1 Crop production                        | 579                                | 1042        | 1049        | 1038        | 31,9                       | 44,4       | 36,8       | 37,2       |
| 2 Mixed, with prevailing crop production | 1039                               | 1128        | 1529        | 1489        | 57,4                       | 48,0       | 53,7       | 53,3       |
| 3 Horticulture, vegetable gardening      | 153                                | 144         | 233         | 230         | 8,4                        | 6,1        | 8,2        | 8,2        |
| 4 Bee-keeping                            | 30                                 | 26          | 24          | 23          | 1,7                        | 1,1        | 0,8        | 0,8        |
| 5 Livestock                              | 3                                  | 4           | 5           | 5           | 0,2                        | 0,2        | 0,2        | 0,2        |
| 6 Medicinal herbs                        | 7                                  | 4           | 8           | 7           | 0,4                        | 0,2        | 0,3        | 0,3        |
| <b>Total:</b>                            | <b>1811</b>                        | <b>2348</b> | <b>2848</b> | <b>2792</b> | <b>100</b>                 | <b>100</b> | <b>100</b> | <b>100</b> |

Information source: Public Institution "Ekoagros"

In the analysed period the least was the number of ecological farms engaged only in livestock – 0.2 percent and growing of medicinal herbs – 0.3 percent. There are also horticultural, vegetable growing and bee-keeping farms which comprised a small portion - 8.8 percent.

To ascertain specialization level in Lithuanian ecological farms in 2005 – 2008, a coefficient was derived according to formula (1):

$$k_{sp.} = 100 / \sum_j P_j (2i-1); \quad (1)$$

where j- kind of product; P<sub>j</sub> – portion within the structure; i- product serial number.

Specialization is low when its coefficient is less than 0.35; medium – when coefficient is between 0.35 – 0.48; high – 0.48 – 0.61; very high – when more that 0.61 (Čiulevičius, 1999).

Having calculated specialization coefficient, it was found that from 2005 to 2008 in ecological farms prevailed medium specialization, as the coefficient in the analysed period ranges within 0.35 and 0.48 interval.

In Lithuanian farms prevail grain and legume crops, as they are grown in almost each ecological farm. Among Lithuanian ecological crops of 2007 prevail grain and legume cereals. Grain crops comprise 49 percent, legumes – 12 percent, mixed legume – grain crops – 8 percent, while perennial grasses – 20 percent from the total certified area..

In 2007, the area of grain crops covered 58775,9 ha, in 2008 – 59777,75 ha, while in 2009, as compared to 2007, the area of grain crops increased by 8.2 percent. The area of legume crops also augmented – even by 33.95 percent (Table 6).

In 2008, as well as in 2007, the highest portion in the areas of ecological farms covered grain crops – 68.5 percent from the total certified area, while perennial grasses – 20.8 percent.

**Table 6**

Area of ecological crops (including fallow land and ponds) in Lithuania and its changes

| Certified area                                    | Area in different years, ha |                  |                  | Area changes in 2009 in comparison to 2007, percent |
|---|-----------------------------|------------------|------------------|---|
|   | 2007                        | 2008             | 2009             |   |
| Grain crops                                       | 58775,90                    | 59777,75         | 63595,63         | 108,20  |
| Perennial grasses                                 | 24480,93                    | 25416,54         | 25918,46         | 105,87  |
| Legume crops                                      | 13884,17                    | 14761,14         | 18598,48         | 133,95  |
| Mixed grain-legume crops                          | 9886,30                     | 9127,96          | 7955,94          | 80,47   |
| Ponds   | 4840,79                     | 4948,89          | 5736,59          | 118,51  |
| Berry fields                                      | 4166,45                     | 4007,99          | 4153,18          | 99,68   |
| Siderated and black fallow land                   | 1770,14                     | 1551,88          | 1271,90          | 71,85   |
| Orchards  | 1252,34                     | 1246,39          | 1271,91          | 101,56  |
| Medicinal, culinary herbs                         | 614,13                      | 672,07           | 830,64           | 135,25  |
| Potatoes, vegetables, mangel                      | 505,75                      | 464,34           | 428,30           | 84,69   |
| Crops failing to comply with density requirements | 240,84                      | 219,95           | 25,97            | 10,78   |
| <b>Total:</b>                                     | <b>120417,80</b>            | <b>122194,90</b> | <b>129787,00</b> | <b>107,78</b>                                       |

Information source: Public Institution “Ekoagros”

In Lithuania, in the analysed period exist ecological farms cultivating not only grain crops, but also medicinal, culinary herbs, various berries, potatoes and vegetables. In 2009, the area of cereals increased still more and comprised already 69.50 percent from the total certified area, while the areas of vegetables and herbs remained very small, hardly reaching 1 percent from the total certified area.

Analyzing specializations of certified ecological production areas, it was found that ecological output is rather diverse. Although certified areas increase, but the development of market for ecological products is unsustainable, because the amounts of produced ecological vegetables, potatoes, mangel, berries and fruit are very small. Thus, farmers have vast possibilities to broaden and diversify their farming specializations. To facilitate this process, new rules of ecological agriculture foresee a series of favourable conditions for farmers: prolonged term for the provision of necessary for certification documents (until 15 April, instead of 31 March previously); simplified design of crop rotation plans – during crop rotation phytosanitary breaks should be observed growing legumes (legume crops should comprise not less than 20 percent of the total amount of cereals), perennial grasses and intermediate plants; the density of plants in orchards and berry fields has been reduced. It was foreseen that density requirements are applicable only to orchards and berry fields established after 2007, while for mixed orchards of up to 0.50 ha in size they are not applied. Having assessed the changes in EU legal acts, and taking into account the experience of other countries, some requirements concerning protective distances were mitigated. Since 2009, ecological farmers are not obliged to observe protective distances from fields where synthetic pesticides and fertilizers are not used. It won't be required to observe distances from smaller roads, except highways and country roads.

In general, it may be stated that a bad tendency has been revealed: farmers are taking the easiest way and started growing monocultures, thus in 2009 the area of grain and legume crops (90150 ha) has inproportionally increased, while siderated and black fallow lands hardly comprise 1272 ha.

### Conclusions

1. In Lithuania the number of ecological farms and their certified area is rapidly increasing every year. In 2003 only 700 ecological farms were certified, while in 2009 – 2733 ecological farms, i.e. almost four times more than in 2003, meanwhile certified areas in 2009, as compared to 2003, increased by 5.6 times.
2. In the country, more ecological farms are found in the southeastern part and in less suitable for farming locations, which occupy part of Biržai and Pasvalys municipalities, while one of the reasons predetermining increase of such farms is support obtained from the EU and Government. One of its measures applied for ecological farms, having the greatest impact, are payments for certified areas engaged in the production of ecological agricultural and food products.
3. In 2008, the greatest number comprised ecological farms of mixed production (53.3 percent), while ecological livestock (0.2 percent) and herb (0.3 percent) production farms were quite few.
4. One of the most important agricultural businesses in the country is growing of grain crops, thus according to the crop structure of ecological farms in Lithuania, in 2008 grain crops occupied 68.5 percent of certified land area, while in 2009 – 69.5 percent.

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## Резюме

### ВАЙВА СТРАВИНСКЕНЕ, АУШРА БАЯРУНАЙТЕ, ЭДИТА АБАЛИКШТЕНЕ, ГЕДРИУС БАЛЯВИЧИУС. ЭКОЛОГИЧЕСКОЕ ФЕРМЕРСТВО В ЛИТВЕ

*В представленной статье проведен анализ распределения экологических хозяйств в Литве, а также их специализация. Началом развития экологического фермерства в Литве считается 1993 год, когда были сертифицированы первые девять хозяйств экологического производства. В настоящее время за счет увеличивающейся финансовой поддержки Европейского Союза и государства этот вид хозяйствования становится все более популярным: с каждым годом растет количество экологических хозяйств. В 2003 г. были сертифицированы 700 экологических хозяйств, а в 2009 г. – почти в четыре раза больше по сравнению с 2003 г. (2733 экологические хозяйства). Однако хозяйства экологического производства составляют лишь 2,6 % от общего числа зарегистрированных хозяйств, в то время как во Франции – 3,2 %, в Германии – 5,9 %.*

*Установлено, что большинство сельскохозяйственных угодий, на которых ведется экологическое фермерство, – до 30 га. Такие хозяйства в 2007 г. составили 65 % от всех сертифицированных хозяйств экологического производства. Большинство из них – это хозяйства смешанного производства с преобладанием растениеводства. Наименьшее количество хозяйств занимается экологическим животноводством и выращиванием лекарственных трав. После расчета коэффициента специализации установлено, что с 2005 г. по 2008 г. специализация экологических хозяйств была средней, так как в исследуемые годы значения коэффициентов лежат в интервале от 0,35 до 0,48. На посевных площадях экологических хозяйств Литвы доминируют злаковые и бобовые растения.*

*Выявлено, что наибольшее количество хозяйств, занимающихся экологическим фермерством, находится в юго-восточной части страны и в местах с наименее благоприятными условиями хозяйствования.*

**Ключевые слова:** экологическое фермерство, хозяйства, специализация, землепользование.

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