

Figure 2. Biggest harvested crops by harvested area (1000 ha), 2015. Source: Eurostat.

The other species of fruit and berries produced in all three countries, aside from apples, are also quite similar (see ANNEX 1 and Fig. 2). In Lithuania, these are black currants (4,360 t in 2015), strawberries (3,200 t), raspberries (2,620 t), pears (1,540 t), plums (610 t), and cherries (350 t). In Latvia, major species include: strawberries (1,400 t), black currants (600 t), pears (500 t), and raspberries, blueberries and plums (each 200 t). In Poland, major produced species are: cherries (227,500 t), strawberries (214,600 t), black currants (159,900 t), plums (94,900 t), raspberries (79,900 t), and pears (69,600 t). On the whole, it can be said that in terms of harvested crops by both harvested area and harvested production over the period between 2000 and 2015, **in Latvia the importance of the fruit sector has been notably decreasing; in Lithuania, with an exception of apples and some growth in the harvested production of strawberries and raspberries, the sector seems to be stagnating; in PL, on the contrary, though with some variation among species, the overall importance of the sector is considerably growing.**

As for the yield capacity, based on a partners' calculation of harvested production tonnage per harvested area (t/ha), it makes up 13.8 t/ha for apples in Lithuania and 11.3 t/ha pears. In Poland, the average yields for main fruit and berry species are estimated as "rather not impressive" and in 2015 were as follows: apples – 17.6 t/ha, strawberries – 3,9 t/ha, sour cherries – 6 t/ha, black currants – 3.35 t/ha, plums – 6.8 t/ha, raspberries – 2.9 t/ha, pears – 7.6 t/ha, and sweet cherries – 5.1 t/ha. **The yields in leading commercial farms are much higher** than presented above – depending on the year and technology of cultivation (irrigations, covers, etc.) they could be three to five times higher.

b. Trade balance and consumption

According to Eurostat data, the **trade balance with regards to the volume of imported and exported fresh and dried fruit is negative in all three countries** (see Fig. 3). The trade deficit is also the case for Latvia and Lithuania regarding preserved fruit and fruit preparations as well as fruit (and vegetable) juices, where Poland, in turn, shows a positive balance with a notable trade surplus.

There are rather considerable differences in the fruit consumption whereby, according to Eurostat data, **in 2014 the share of population consuming fruit at least once a day ranged from 40% in Latvia and 48% in Lithuania to 59% in Poland** (EU28 average – 56%), featuring higher levels of consumption in cities compared to towns and suburbs and rural areas as well as by females compared to males.

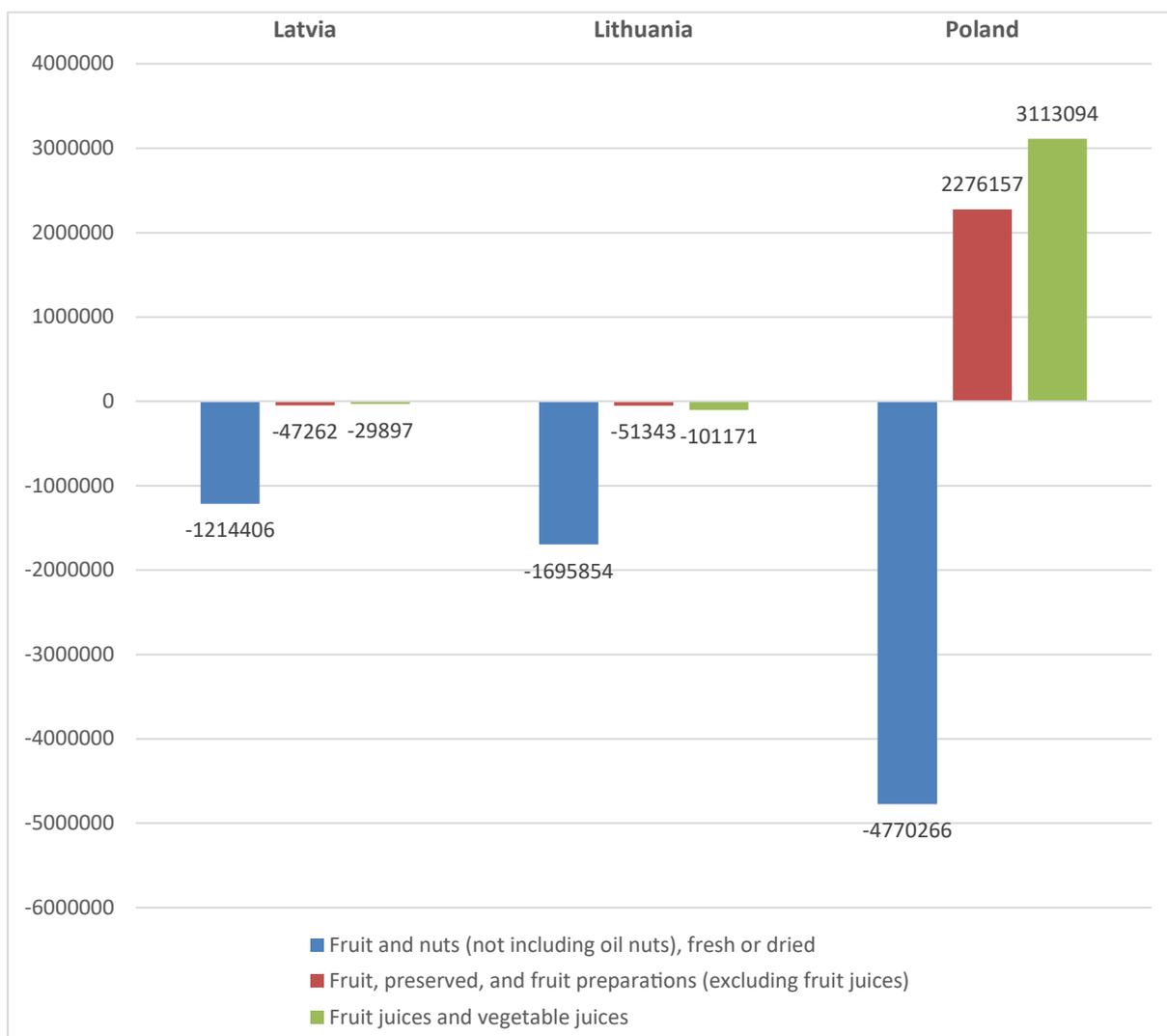


Figure 3. Trade balance of fruit (quantity in 100 kg), 2017. Source: Eurostat.

Fruit consumption statistics indicate that there is potential for increasing both fruit production (in Latvia and Lithuania) **and consumption** (in all three countries) as a considerable share of the population (54% in Latvia, 47% in Lithuania, and 36% in Poland) do not consume fresh fruits daily or consume them less than the recommended intake by the World Health Organisation which is 400 g or 5 portions per day.³ In all three countries there are generally higher levels of consumption in cities compared to towns and suburbs and rural areas as well as by females compared to males.

It is worth noting that according to Eurostat data on the selling prices of selected crop products in 2016 there are notable differences in the selling prices (EUR per 100 kg) of dessert apples among the three countries, ranging from EUR 13,4 in Poland to EUR 36,7 in Lithuania and EUR 44,5 in Latvia.⁴ **The selling price of dessert apples in Poland is about three times lower than in Lithuania and Latvia,** which also potentially bears an impact on the consumption trends.

³ http://ec.europa.eu/eurostat/statistics-explained/index.php/File:T11_newbis_EU-28_Daily_consumption_of_fruit_and_vegetables_2014.png; FRESHFEL EUROPE (2012) *A Review of the EU regime for the fruit and vegetables sector*. Available at: http://ec.europa.eu/agriculture/sites/agriculture/files/fruit-and-vegetables/policy/consultation/registered-organisations/freshfel_en.pdf

⁴ Eurostat (2017) *Agricultural production – crops*. Available at: <https://ec.europa.eu/eurostat/statistics-explained/pdfscache/26212.pdf>

c. *Scope of commercial actors*

The fruit growing and processing sector (FGPS) has a varied importance in the agricultural sector in the Project countries in terms of the number of companies. According to the data provided by Project partners **comparatively few farms are specialised in fruit growing in Lithuania and Latvia**. In absolute numbers, there were 1,600 holdings in Lithuania in 2015, 900 in Latvia in 2010, and they account for around 1% of all agricultural companies. In Poland, there were 284,755⁵ fruit holdings in 2010, and they composed around 15% of all agricultural holdings. Still, the data gathered represent different periods of time and thus this comparison should be used with caution.⁶

Typically, fruit growing is a specialisation of small and medium-sized companies: all FG farms in Lithuania and Latvia⁷ and almost all in Poland are small or medium-sized; 90% of Latvian FG companies can be considered as micro companies. **In all three countries there is a negative dynamic in the number of FG companies** – their number is decreasing. However, according to Eurostat the overall trends were caused by different processes (the data discussed here cover the period up to 2013). In Latvia, farms of all sizes were leaving the sector during the last decade. Meanwhile, in Poland and Lithuania mainly the smaller farms were abandoning the sector. If decade long trends are considered, in Poland and Lithuania the number of fruit and berry plantations with an area of over 50 ha has remained almost the same. Furthermore, the average size of the farms exceeding 50 ha in these two countries has grown.

Likewise, **the fruit processing (FP) sector involves few companies:** in absolute numbers there were 90 FP companies in Lithuania, 49 in Latvia⁸, and around 1,000 in Poland, which compose from 0.05% (LV) to 0.1% (LT) of all processing companies in the country (no data for Poland). Also, fruit processing is dominated by small and medium-sized companies – their share is estimated at over 95% in Poland (no data for Lithuania and Latvia). **The number of companies in FP sector has been growing in Poland.** In Poland, particularly the number of companies producing juices has increased considerably.

d. *Innovative capacity of companies*

Based on the Eurostat approach whereby innovation is defined as “the implementation of a new or significantly improved product (good or service), process, new marketing method, or new organisational method in business practices, workplace organisation or external relations⁹”, data from the Community Innovation Survey 2014 demonstrate that on the country level the share of innovative companies among all companies was as high as 43.3% in Lithuania, followed by Latvia with 25.5%, and Poland with 21.0% (with Sweden featuring 54.2%). Yet, there are no disaggregated data available on the number of innovative companies specifically in FGPS.

According to project partners’ own estimations, innovative companies in FGPS make up from 2% (PL) to 8% (LT) of all fruit processing companies. There are no estimations made for Latvia; however, there are examples of companies introducing new technologies and products by themselves or in cooperation with scientists (e.g., *Rāmkalni*, *Very Berry*). In Poland, the innovativeness is related to such factors as “*extensive use of internet to establish and develop foreign contacts, and also for*

⁵ With area no smaller than 0,1 ha.

⁶ Eurostat data for 2013 (http://ec.europa.eu/eurostat/statistics-explained/index.php/File:F7_National_diffusion_of_fruit_holdings_and_area_2013.png) show that in Lithuania the share of fruit holdings is over 40%, in Latvia – less than 10%, and in Poland – around 15%.

⁷ According to the definition for SMEs applied in Latvia: micro enterprise - employees <10, turnover <€2m, balance sum <€2m; small enterprise – employees <50, turnover <€10m, balance sum <€10m; medium enterprise – employees <250, turnover <€50m, balance sum <€43m.

⁸ Excluding very small companies and artisanal producers.

⁹ Innovation activities include the acquisition of machinery, equipment, buildings, software, and licenses; engineering and development work, feasibility studies, design, training, R&D and marketing when they are specifically undertaken to develop and/or implement a product or process innovation. This includes also all types of R&D consisting of research and development activities to create new knowledge or solve scientific or technical problems. See http://ec.europa.eu/eurostat/cache/metadata/en/inn_cis9_esms.htm

distribution of their products, gaining new technological knowledge, buying special machines, acquiring new varieties, etc. Personal business travels are also common in this group of farms.” The Polish report also states that **processing companies and supply firms are much more innovative than fruit growing holdings**, particularly due to higher level of education and language skills of their leaders and better access to capital.

e. Workforce profile

There are around 6,000 employees working in FG companies in Latvia, 8,250 in Lithuania, and 200,000 in Poland. In addition to this number, Poland reports about twice as many seasonal workers who find short-term employment during the harvest season. Meanwhile, the FP sector employs around 700 people in Latvia, 544 in Lithuania, and around 50,000 permanently employed in Poland.

The workforce age structure is slightly different in the studied countries (data are available only for Latvia and Poland); a comparison is difficult, though, due to different age groups used and data representativeness and differences in the period the given statistics represent – in Latvia the data characterise only members of the Latvian Association of Fruit Growers in 2015, not the whole sector. In Latvia, FG is rather ‘old’ as mostly elder farmers work in it: 59% are between 45 and 64 years, and 29% – over 65. **Fruit growers are older than farmers on average in Latvia.** This age structure of farmers in Latvia is close to the one observed in the European Farm Structure Survey 2013. In Poland, in turn, the majority (79%) of fruit farm owners were in the age group between 30 and 59 years. Although it is hard to tell from the data available, it still seems that the age structure of Polish fruit farmers does not differ from the age structure of Polish farmers in general. The youngest group in both countries is the smallest one; in Latvia those between 18 and 24 years compose only 2%, in Poland those below 29 were 4%.

Data on the education level of workforce in FGPS are not comparable as they refer to different groups: the Lithuanian report considers all FGPS workforce, while the Polish report regards only those farm owners with professional education in horticulture (data not available for Latvia). However, data show a similar trend that **majority of fruit growers hold basic professional education, and a minority has university education.** In Lithuania, 19% of all FGPS workforce had university education, 26% - higher education, 55% - professional education. In Poland, only 20% of farm owners had any horticultural education, but their share has doubled in comparison to 2007. Among those with horticultural schooling, 54% had basic vocational education, 24% – secondary, 7% – tertiary, and 15% – other type of professional education.

f. Cooperation

In Latvia, the number of cooperatives in FGPS sector is 5 to 7 (depending on the source). Rough estimations indicate that they have around 150 members in total. Given the minor share of FG in Latvian agriculture, this small number of cooperatives is a comparatively big one (in total the Ministry of Agriculture reports of 47 farmers’ cooperatives in 2015). Some of these cooperatives are working with both fruits and vegetables. Meanwhile each of these cooperatives features a specific focus or specialisation. For example, “Rūjienas OGA” has strong geographical ties with the territory it is located in; “Zaļais grozs” focuses on biological products, “Baltijas ogu kompānija” works with berries, while some other cooperatives are specialising mainly in apples. **The number of fruit growers’ cooperatives has been growing in Latvia.**

The report from Lithuania indicates that there are only 3 FG cooperatives with 19 members in total: “Ažuožerių sultys”, “Šiaurės Lietuvos uogynai”, and “Mūsų gojus”. Two of these – “Ažuožerių sultys” and “Mūsų gojus” – are mainly specialised in apples and apple juice production. Meanwhile the third cooperative is working with berries. In Lithuania in general cooperatives unite around 10% of all farmers and thus the **level of cooperation in fruit sector in Lithuania is low.** Cooperatives are accountable for around 5% of Lithuanian fruit and vegetable production.

In Poland, in 2014 there were 1,173 producer groups granted preliminary recognition with fruit and vegetable production with more than 2.6 thousand members, and 139 acknowledged groups of fruit and vegetables producers with about 0.3 thousand members.

Main sectoral similarities and differences

The brief overview of the fruit sector in Latvia, Lithuania and Poland provides some basic information for making selected comparisons between the countries and identifying some implications for innovation potential and demonstration activities in the sector:

- There are pronounced differences between data reported by project partners on selected quantitative **indicators** characterising the fruit sector and how some of these are presented by Eurostat. This might have some further implications for differing perceptions of the sector's profile and view on its perspectives among practitioners, researchers and policy makers;
- The three countries are different in terms of the role the fruit sector plays in the national economies both in terms of the number of companies and workforce involved in the sector and the share of the sector in the total agricultural output, with Poland notably standing out with regards to the **economic importance and scale of the fruit sector**;
- Nevertheless, a common feature is the predominance of small and medium-sized **companies in FGPS** in all three countries, with a somewhat shared tendency for the smaller fruit farms to leave the sector, simultaneously demonstrating growing activity in terms of fruit processing;
- All three countries have rather similar main **produced species** of fruits and berries, unanimously dominated by apples and followed by black currants, strawberries, and raspberries, thus providing a good basis for shared interests and peer-to-peer learning across Latvia, Lithuania, and Poland;
- Some of the common problems faced by the fruit sector in all three countries, though to varying degrees, include **ageing and comparatively low share of formally educated farmers** that might have an impact on the succession, sustainability, and advancement prospects of the fruit farming community and modern knowledge-based practices;
- **Formal business cooperation** in the fruit sector has been developing in all three countries, yet with a notable untapped potential especially in Lithuania;
- So far there have been limited or no hard data on the presence and scope of existing **demonstration farms** in the fruit sector that would allow to make any assessments regarding their density and spread in the three countries;
- The overall **innovative capacity of companies** operating in the fruit sector is presently hard to assess given the lack of representative and reliable data, nevertheless individual examples of companies, especially in fruit processing, demonstrate the willingness and efforts made by those in introducing both product and process innovations along with innovations in organisation and marketing; this is of particular importance in relation to demonstration activities of innovative farming approaches in real-life environments and the readiness of farmers, processors, advisors and other relevant stakeholders to engage in collaborative relations facilitating mutual learning, generation and uptake of innovative solutions along the various stages in the supply chain;
- The **production and processing capacity of local companies** in all three countries, but especially in Latvia and Lithuania, still has considerable room for development and expansion given the present size of the sector and the possibilities for increasing the level of local consumption of both fresh and processed fruit and berries.

prominent in Poland. 52% of respondents in Latvia grew or processed fruit, while 47% and 37% of respondents grew or processed fruit in Poland and Lithuania respectively. Lithuania was the leader in terms of respondents growing or processing berries (83%), and berries were also popular in Latvia (59%), though less so in Poland (18%). Poland, however, was the leader when it came to vegetables (35%).

While respondents in all countries collaborated with scientists, collaboration with other horticulturists was less prominent in Poland. In Poland, scientists and advisers were the most popular choices with 33% and 31% of respondents selecting them. In Lithuania, the leaders were other horticulturists (67%), with scientists in second place (50%). Other horticulturists were the most popular choice in Latvia (83%), followed by sectorial associations (54%) and scientists (52%).

Most respondents had attended a demonstration in the field of horticulture, and Latvia had the highest percentage of respondents who had attended a demonstration abroad. 83% of respondents from Lithuania and 75% of respondents from Poland had attended a demonstration in the field of horticulture, while only 37% of Lithuanian respondents and 18% of Polish respondents had attended a demonstration abroad. 91% of respondents from Latvia had attended a demonstration, and 56% had attended a demonstration abroad.

Most respondents were planning to attend a demonstration in the next 12 months, but respondents from Poland were less likely to go abroad. 82% of respondents in Latvia indicated that they are planning to attend a demonstration in the next twelve months, and just over half (42%) answered that they are thinking of going to a demonstration abroad. In Lithuania, 79% of respondents were planning to attend a demonstration in the next 12 months, with 42% indicating that they may also travel abroad. In Poland, 71% of respondents were planning to attend a demonstration in the next 12 months, but only 22% were planning to go abroad for this.

In all three countries, public events at research institutions were the most popular form of demonstration. 58% of respondents from Poland answered that they had attended a public event at a research institution. In Lithuania, 70% of respondents had attended this form of demonstration. In Latvia, the three most popular were public events at research institutions (65%), public events on commercial farms (61%) and organised group trips to commercial farms (61%).

In all countries, attendance of demonstrations has often lead to changes or encouraged attendees to consider introducing changes (see Fig. 4). 55% of respondents from Poland answered that they were planning to introduce at least minor changes after attending a demonstration, and 13% of respondents had already introduced some changes. Only 11% said that no changes are planned. While 19% of respondents in Lithuania had not introduced any changes or could not say whether they had introduced any changes, most respondents had introduced some changes (65%) or were considering doing so (44%). In Latvia, only 10% of respondents indicated that attendance of demonstrations had had no effect on their farm or business. More than half (55%) noted that small changes have been introduced and 31% of respondents indicated that significant changes had been introduced.

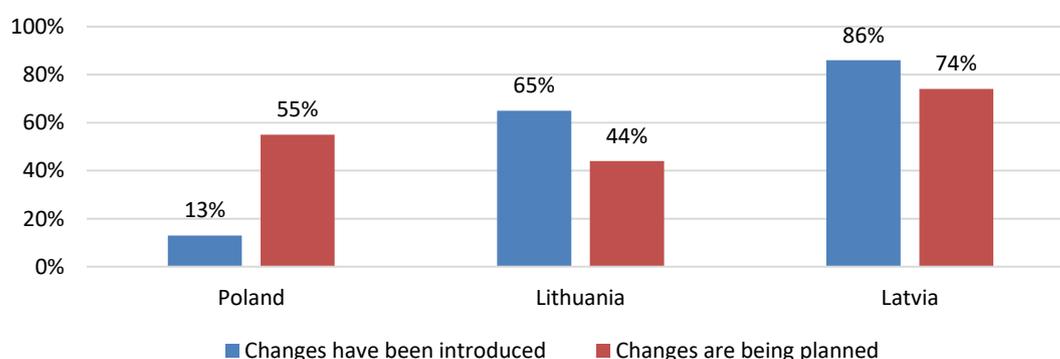


Figure 4: Impact of attending demonstrations on farm.

ANNEX 1: Selected indices of fruit and berry production in Latvia, Lithuania and Poland (EUROSTAT)

**10 biggest harvested crops by harvested area
(1000 ha)**

Latvia

	2000	2005	2010	2015
Apples	8.10	8.50	3.30	2.40
Currants	0.80	0.90	0.60	0.60
Strawberries	0.80	0.70	0.30	0.40
Raspberries	0.00	0.20	0.20	0.20
Blueberries	:	:	:	0.20
Pears	0.50	0.80	0.20	0.20
Cherries	0.70	0.90	0.10	0.10
Plums	0.80	1.00	0.10	0.10
Gooseberries	0.20	0.10	0.00	:

Lithuania

	2000	2005	2010	2015
Apples	:	17.51	9.57	10.68
Currants	:	5.00	4.18	3.81
Raspberries	:	0.42	0.80	1.29
Strawberries	0.77	2.97	0.93	1.01
Pears	:	0.69	0.72	0.87
Cherries	:	0.78	0.77	0.78
Plums	:	0.73	0.72	0.77
Blueberries	:	:	:	0.08
Walnuts	0.00	0.00	0.04	0.06
Hazelnuts	0.00	0.00	0.00	0.03

Poland

	2000	2005	2010	2015
Apples	1 65.10	1 69.70	1 70.40	1 80.40
Strawberries	62.00	55.10	51.73	52.30
Currants	33.50	47.10	42.66	44.40
Cherries	51.40	44.00	45.10	39.10
Raspberries	12.60	17.80	29.60	27.40
Plums	31.70	20.80	17.90	13.90
Pears	18.30	12.60	8.40	9.20
Hazelnuts	:	2.60	3.60	3.60
Blueberries	:	:	:	3.20
Walnuts	:	2.30	29.10	2.50
Peaches	10.30	3.30	3.40	2.40

**10 biggest harvested crops by harvested production
(1000 t)**

Latvia

	2000	2005	2010	2015
Apples	35.40	37.50	10.30	7.80
Currants	:	5.20	0.40	0.60
Strawberries	4.60	4.00	0.60	1.40
Raspberries	0.10	0.50	0.20	0.20
Blueberries	:	:	:	0.20
Pears	1.30	2.00	0.20	0.50
Cherries	1.40	1.90	0.10	0.10
Plums	2.10	2.40	0.00	0.20
Gooseberries	0.60	0.80	0.00	:

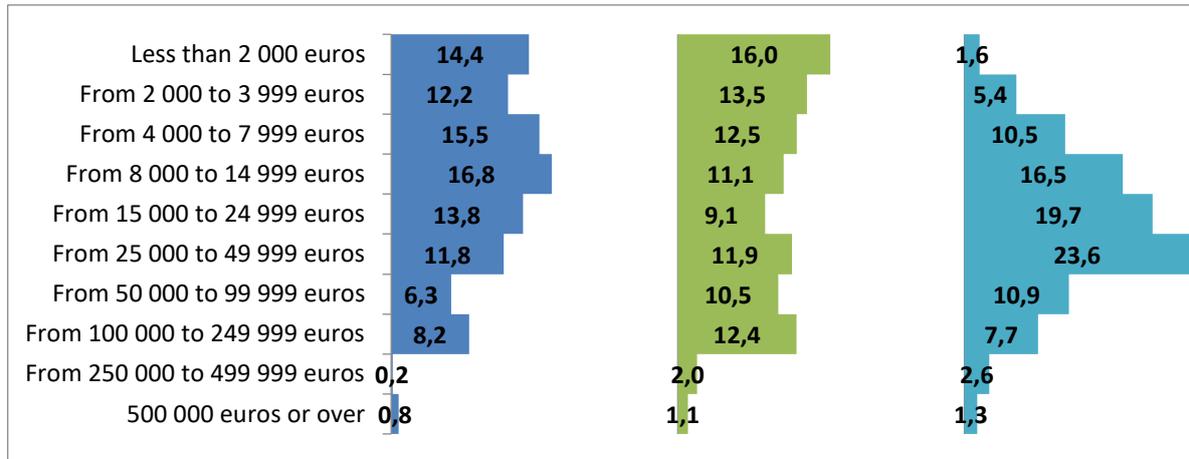
Lithuania

	2000	2005	2010	2015
Apples	:	84.38	29.22	64.97
Currants	:	7.66	4.03	4.36
Raspberries	:	0.54	1.22	2.62
Strawberries	1.38	10.18	2.10	3.20
Pears	:	1.92	0.96	1.54
Cherries	:	0.85	0.24	0.35
Plums	:	1.57	0.75	0.61
Blueberries	:	:	:	0.11
Walnuts	0.00	0.00	0.01	0.04
Hazelnuts	0.00	0.00	0.00	0.04

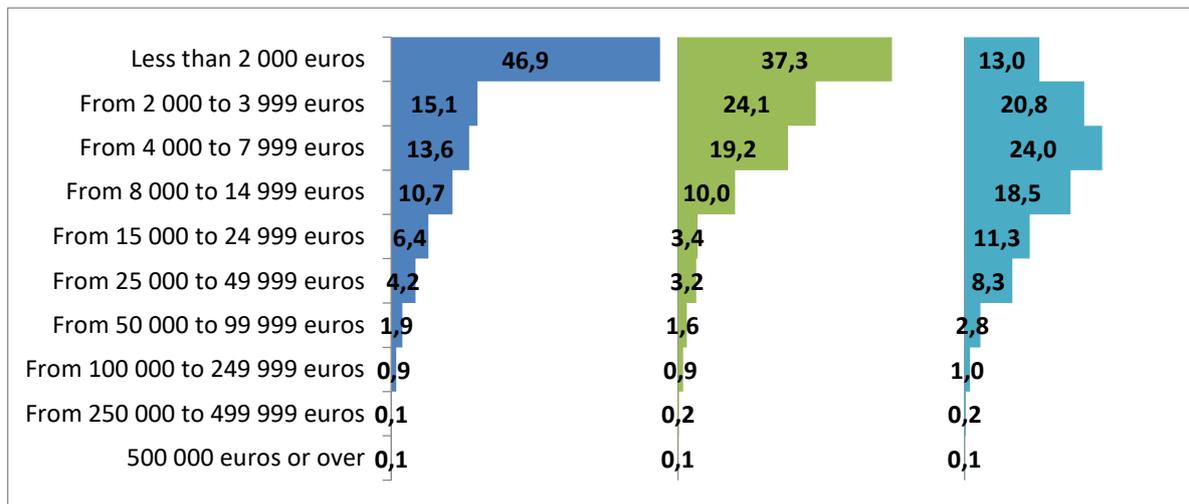
Poland

	2000	2005	2010	2015
Apples	14 50.40	20 75.00	18 77.90	31 68.80
Strawberries	1 71.30	1 84.60	1 76.75	2 14.60
Currants	1 46.80	1 86.80	1 90.78	1 59.90
Cherries	1 78.10	1 77.40	1 87.40	2 27.50
Raspberries	39.70	65.50	92.90	79.90
Plums	1 06.90	91.40	83.80	94.90
Pears	81.60	59.30	46.50	69.60
Hazelnuts	:	3.10	2.60	5.40
Blueberries	:	:	:	14.10
Walnuts	:	5.80	9.20	7.10
Peaches	20.00	9.60	9.30	9.90

Land use: Standard outputs in Euros for Fruit and Berry plantations in 2013 by u



Land use: Standard outputs in Euros for Fruit and Berry plantations in 2013 by u



Land use: Fruit and Berry plantations in 2013 by agricultural size of farm

