The EU organic seed sector – statistics on organic seed supply and demand

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Introduction

According to the current EU organic regulation (EC) 834/2007, organic farmers should be using organic seed. This reflects the principle of organic agriculture that only organic inputs should be used whenever external inputs are needed. However, at present, the use of organic seed is still limited. This means that the EU demand of organic seed for some crops - which is defined as the quantity of organic seed that organic farmers are willing to pay and able to purchase at a certain price - may represent only a small proportion of the total potential demand. For many organic crops in the EU Member States and Switzerland, there is a lack of organic seed available, resulting in frequent use of non-organic untreated seed (Döring et al., 2012). Although authorisations for the use of non-organic seed is considered as an exception to the organic production rule, according to Solfanelli et al. (2019) data on derogation requests in the EU show that non-organic untreated seed supply still represents an important part of the total demand of seed used by the EU organic farmers. Furthermore, the actual demand for organic seed is also affected by the rate of farm-saved seed used, which varies among countries and crops.

To the best of our knowledge, there are currently no official statistics reporting data on supply and demand of organic seed, either at national or EU level. This report provides a first estimate of the current supply and demand for organic seed in Europe, with the aim to increase transparency and help future market development of the organic seed sector. This data provides a useful indication of the European situation about organic seed and provides industry and policymakers with essential information for decision making and functioning of organic seed markets. This is especially relevant as the new European Organic Regulation 2018/848 has announced the phasing out of derogations for the use of non-organic untreated seed by 2036. Because of limited resources and data availability, the analysis was focused on a limited number of crop species for arable, forage, vegetable and fruit sectors, selected based on their relevance for European organic agriculture. The study was conducted for the EU Member States and Switzerland. Table 1 gives an overview of the potential demand of organic seed and the estimated share of organic farm saved seed, organic seed supply from seed companies and non-organic untreated seed supply.

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Table 1. Estimated amount of seed and plant reproductive material used in organic farming in EU Member States and Switzerland in 2016.

	Organic seed supply (Amount & percentage)		Organic farm saved seed (Amount & percentage)		Non-organic seed supply (Amount & percentage)*	
CEREALS						
Barley (metric tons)	21.348	47%	12.466	28%	11.285	25%
Grain maize (metric tons)	1.521	51%	168	6%	1.309	44%
Oat (metric tons)	23.247	43%	18.765	34%	12.503	23%
Wheat (metric tons)	60.727	42%	37.201	26%	46.637	32%
LEGUMES						
Lucerne (metric tons)	1.115	43%	249	10%	1.217	47%
Peas (metric tons)	5.638	42%	2.564	19%	5.149	39%
Soybeans (metric tons)	4.549	46%	2.037	20%	3.374	34%
VEGETABLES						
Carrot (mio of seeds)	3.018	24%	106	1%	9.331	75%
Onion (mio of seeds)	2.277	55%	235	6%	1.648	40%
Tomato (nr. of transplants)	52.586.746	22%	22.952.357	10%	162.971.075	68%
FRUIT & BERRIES						
Apples (nr. of transplants)	1.629.674	36%	585.247	13%	2.280.694	51%
Strawberries (nr. of transplants)	35.984.450	21%	6.213.572	4%	129.035.509	75%

** untreated conventional seeds used in organic farming*

The Figures below show the absolute potential demand of organic seed based on seeding rate and land area in 2014 till 2016 for cereals (barley, maize, oat, wheat), forage (lucerne), grain legumes (pea, soybean), vegetables (carrot, tomato), fruits (apple) and berries (strawberry). In addition, the estimated amount of organic farm saved seed, organic seed supply from seed companies and non-organic untreated seed supply are presented for all crops and EU regions for the year 2016.

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Cereals

Barley (*Hordeum vulgare*)

***Figure 1** – Estimated **demand** of barley seed used in organic farming in EU Member States and Switzerland in the years 2014, 2015 and 2016 (metric tons)*

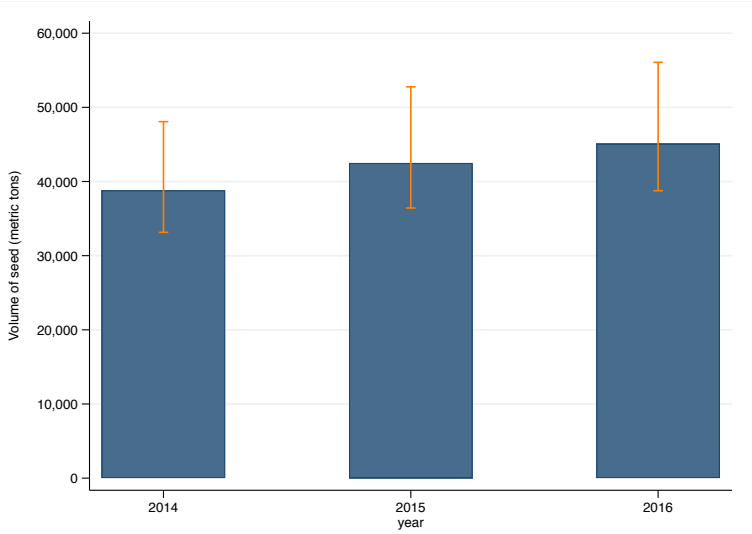
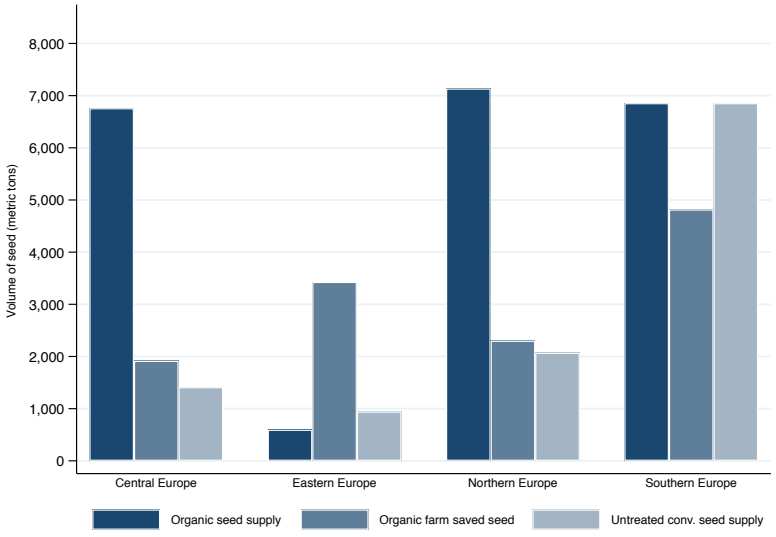


Figure 1 illustrates the estimated demand of organic barley seed in the EU and Switzerland. In 2016, the potential seed demand in term of volume of seed required by European organic farmers was 45,098 metric tons, ranging from a minimum of 38,757 metric tons to a maximum of 56,070 metric tons.

***Figure 2** – Estimated **amount** of barley seed used in organic farming in EU Member States and Switzerland in 2016 by EU regions (metric tons)*

Figure 2 shows the estimated amount of barley seed used in organic farming in EU Member States and Switzerland, by EU regions. The highest share of organic seed supply was in Central and Northern Europe with 67% and 62%, respectively. Eastern and Southern Europe showed the lowest share of organic seed supply with 37% and 12%, respectively.



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Grain maize (*Zea mays*)

***Figure 3** – Estimated **demand** of grain maize seed used in organic farming in EU Member States and Switzerland in the years 2014, 2015 and 2016 (metric tons)*

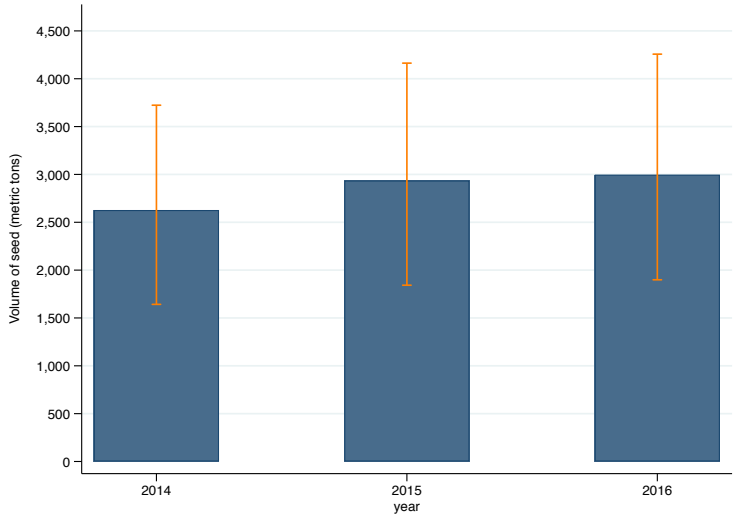
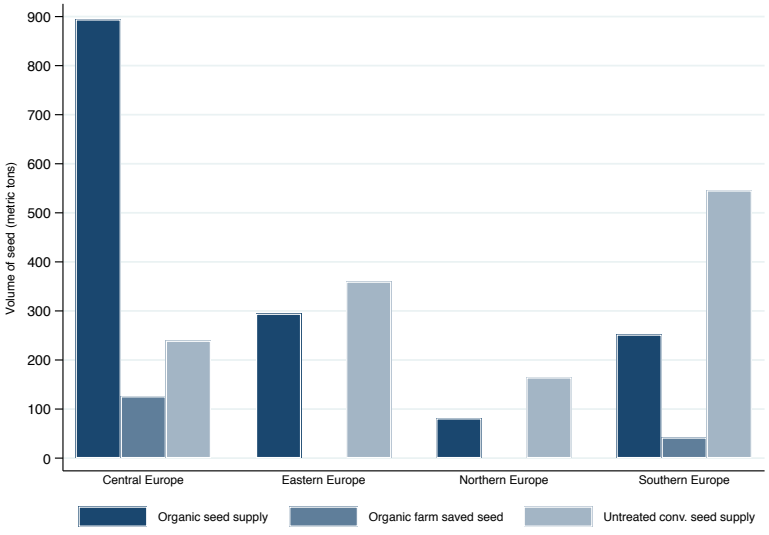


Figure 3 illustrates the estimated demand of organic grain maize seed in the EU and Switzerland. In 2016, the potential seed demand in terms of volume of seed required by European organic farmers was 2,998 metric tons, ranging from a minimum of 1,899 metric tons to a maximum of 4,257 metric tons.

***Figure 4** – Estimated **amount** of grain maize seed used in organic farming in EU Member States and Switzerland in 2016 by EU regions (metric tons)*

Figure 4 shows the estimated amount of grain maize seed used in organic farming in EU Member States and Switzerland, by EU regions. The highest share of organic seed supply was in Central Europe with approximately 71%, followed by Eastern Europe with 45%. Southern and Northern Europe showed the highest share of non-organic untreated seed with 55% and 65%, respectively.



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Oat (*Avena spp.*)

***Figure 5** – Estimated **demand** of oat seed used in organic farming in EU Member States and Switzerland in the years 2014, 2015 and 2016 (metric tons)*

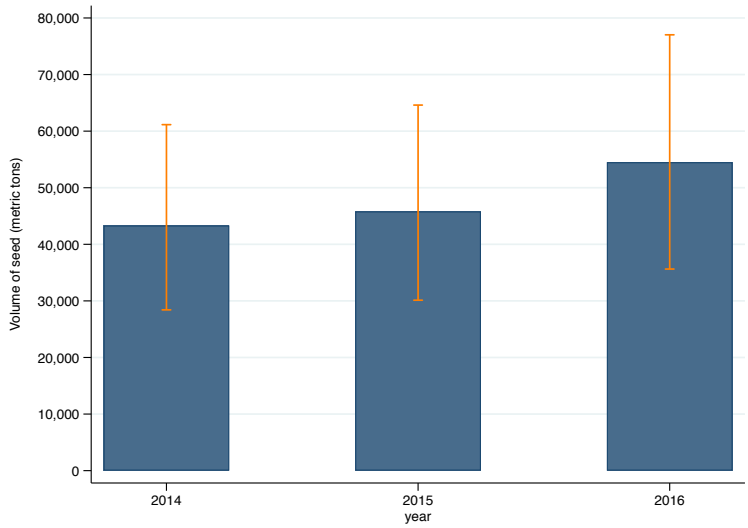

Figure 5 illustrates the estimated demand of organic oat seed in the EU and Switzerland. In 2016, the potential seed demand in terms of volume of seed required by European organic farmers was about 54,516 metric tons, ranging from a minimum of about 35,626 metric tons to a maximum of about 77,022 metric tons.

***Figure 6** – Estimated **amount** of oat seed used in organic farming in EU Member States and Switzerland in 2016 by EU regions (metric tons)*

Figure 6 shows the estimated amount of oat seed used in organic farming in EU Member States and Switzerland, by EU regions. The highest share of organic seed supply was in Central Europe with approximately 65%, followed by Northern and Southern Europe with 46% and 41%, respectively. Eastern Europe showed the highest share of both non-organic untreated seed supply and organic farm saved seed with 48% and 38%, respectively.

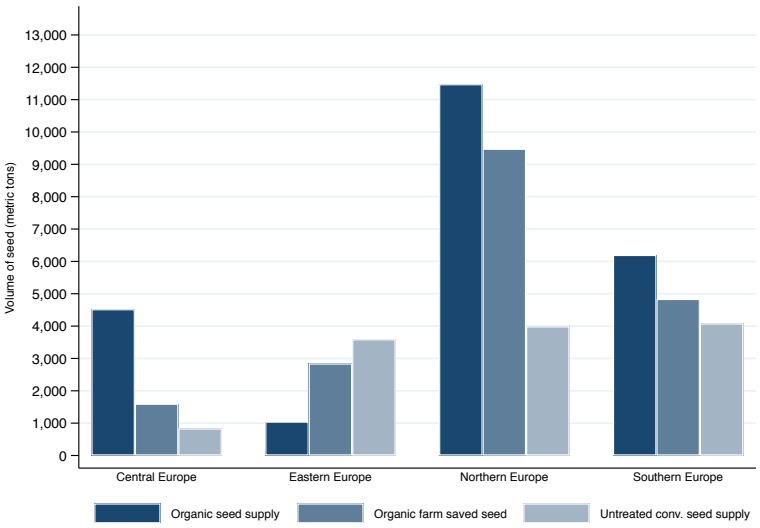

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***Figure 7** – Estimated **demand** of wheat seed used in organic farming in EU Member States and Switzerland in the years 2014, 2015 and 2016 (metric tons)*

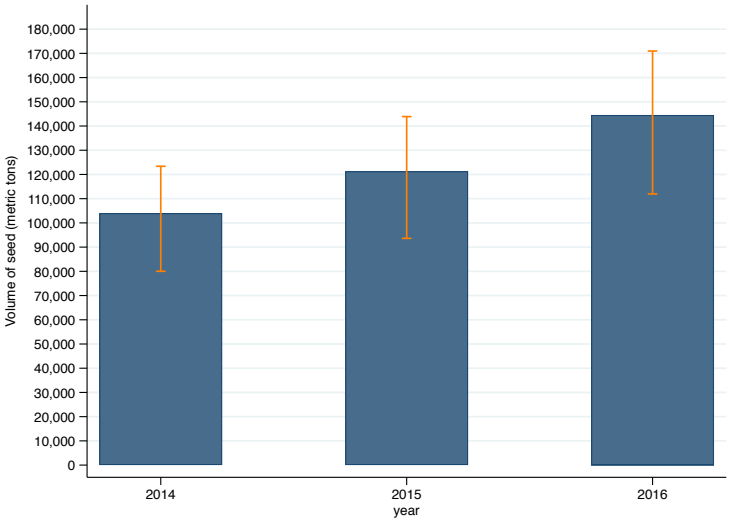
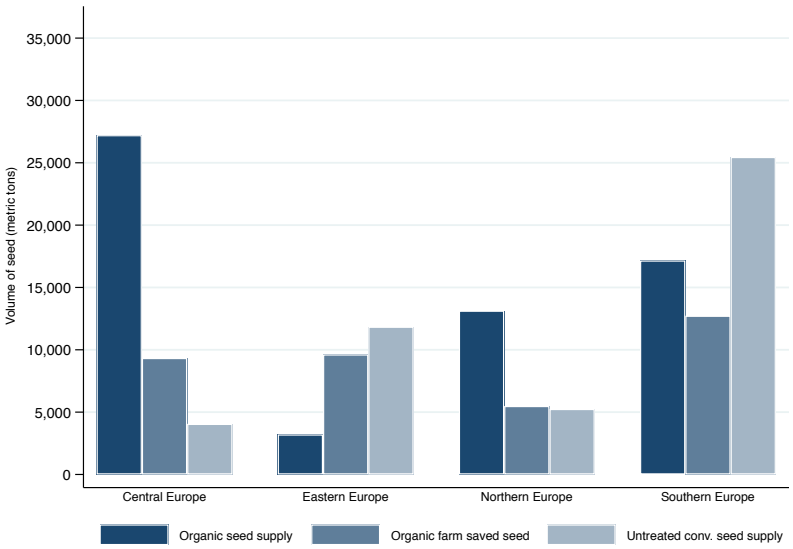


Figure 7 illustrates the estimated demand of organic wheat seed in the EU and Switzerland in 2014-2016. In 2016, the potential seed demand in terms of volume of seed required by European organic farmers was 144,564 metric tons, ranging from a minimum of 111,943 metric tons to a maximum of 170,962 metric tons.

***Figure 8** – Estimated **amount** of wheat seed used in organic farming in EU Member States and Switzerland in 2016 by EU regions (metric tons)*

Figure 8 shows the estimated amount of wheat seed used in organic farming in EU Member States and Switzerland, by EU regions. The highest share of organic seed supply was in Central Europe with approximately 67%, followed by Northern countries with 55%. Southern and Eastern Europe showed the lowest share of organic seed supply with 31% and 13%, respectively.



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Lucerne (*Medicago sativa*)

***Figure 9** – Estimated **demand** of lucerne seed used in organic farming in EU Member States and Switzerland in the years 2014, 2015 and 2016 (metric tons)*

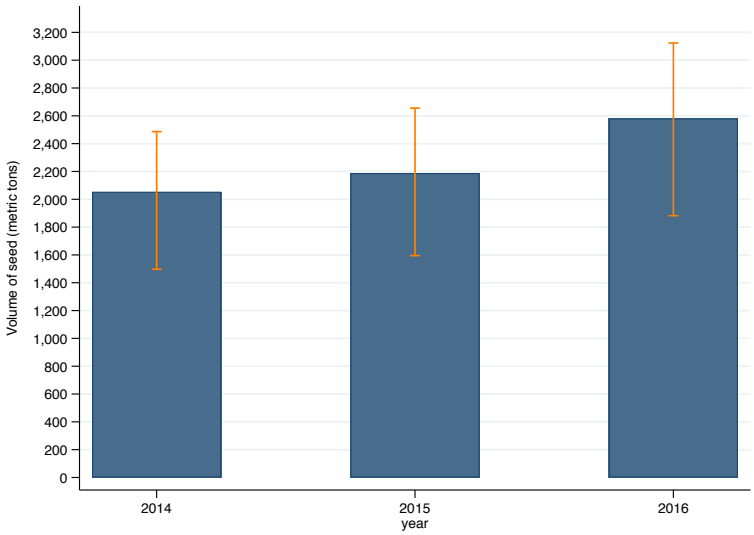
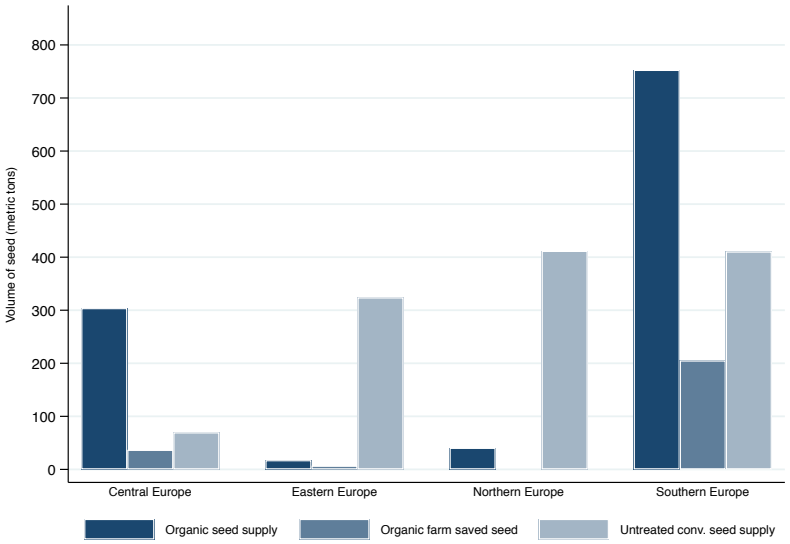


Figure 9 illustrates the estimated demand of organic lucerne seed in the EU and Switzerland. In 2016, the potential seed demand in terms of volume of seed required by European organic farmers was 2,582 metric tons, ranging from a minimum of 1,882 metric tons to a maximum of 3,124 metric tons.

***Figure 10** – Estimated **amount** of lucerne seed used in organic farming in EU Member States and Switzerland in 2016 by EU regions (metric tons)*

Figure 10 shows the estimated amount of lucerne seed used in organic farming in EU Member States and Switzerland, by EU regions. The highest share of organic seed supply was in Central and Southern Europe with 74% and 55%, respectively. Eastern and Northern Europe showed the highest share of non-organic untreated seed with 93% and 91%, respectively.



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Pea (*Pisum sativum*)

***Figure 11** – Estimated **demand** of pea seed used in organic farming in EU Member States and Switzerland in the years 2014, 2015 and 2016 (metric tons)*

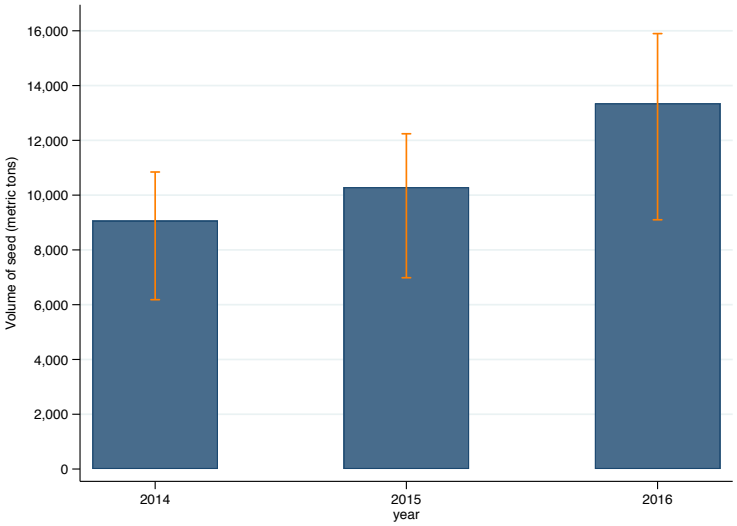
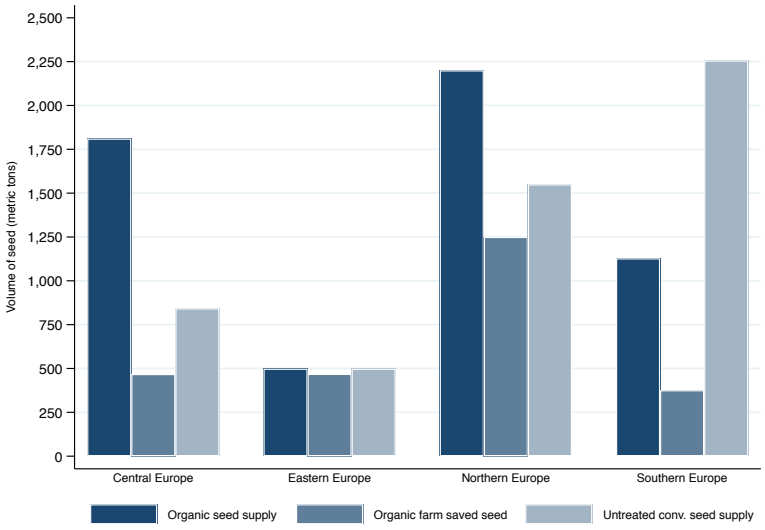


Figure 11 illustrates the estimated volume of organic pea seed in the EU and Switzerland. In 2016 the potential seed demand in terms of volume of seed required by European organic farmers was 13,351 metric tons, ranging from a minimum of 9,101 metric tons to a maximum of 15,897 metric tons.

***Figure 12** – Estimated **amount** of pea seed used in organic farming in EU Member States and Switzerland in 2016 by EU regions (metric tons)*

Figure 12 shows the estimated amount of pea seed used in organic farming in EU Member States and Switzerland by EU regions. The highest share of organic seed supply was in Central Europe with approximately 58%, followed by Northern and Eastern Europe with 44% and 34%, respectively. Southern Europe showed the highest rate of untreated conventional seed (60%).



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Soybean (*Glycine max*)

***Figure 13** – Estimated **demand** of soybean seed used in organic farming in EU Member States and Switzerland in the years 2014, 2015 and 2016 (metric tons)*

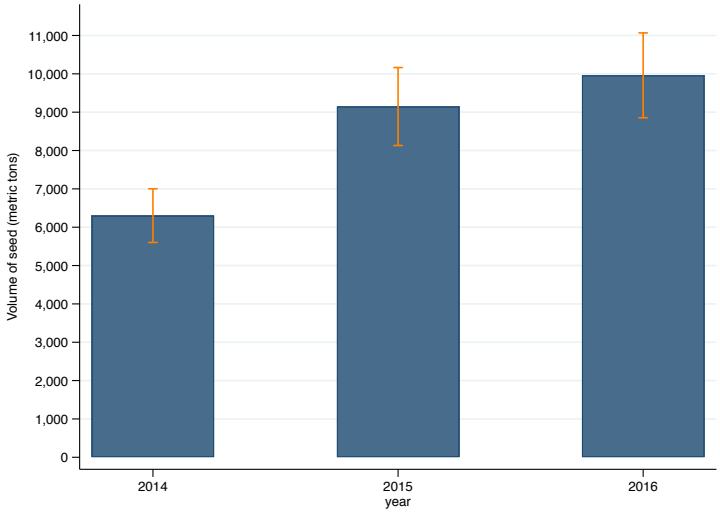
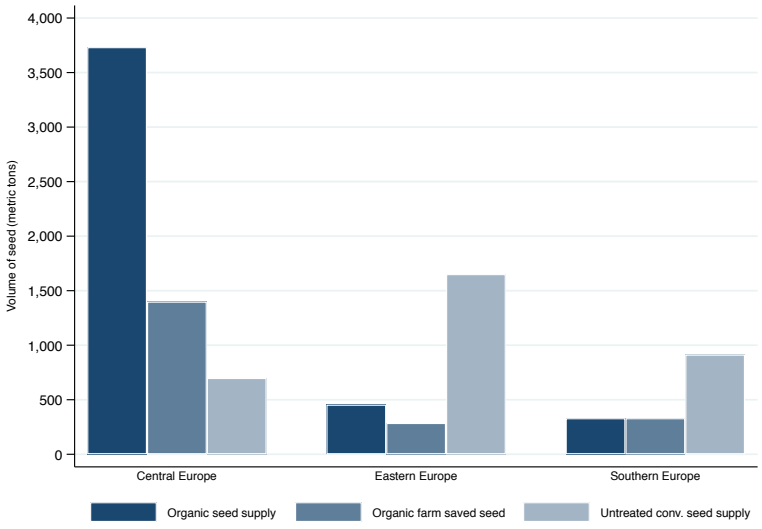


Figure 13 illustrates the estimated demand of organic soybean seed in the EU and Switzerland. In 2016, the potential seed demand in terms of volume of seed required by European farmers was about 9,961 tons, ranging from a minimum of about 8,854 metric tons to a maximum of about 11,067 metric tons.

***Figure 14** – Estimated **amount** of soybean seed used in organic farming in EU Member States and Switzerland in 2016 by EU regions (metric tons)*

Figure 14 shows the estimated amount of soybean seed used in organic farming in EU Member States and Switzerland, by EU regions. The highest share of organic seed supply was in Central Europe with approximately 64%, followed by Southern and Eastern Europe with 21% and 19%, respectively. Eastern and Southern Europe showed the highest share of non-organic untreated seed with 69% and 58%, respectively.



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Vegetables

Carrot (*Daucus carota*)

***Figure 15** – Estimated **demand** of carrot seed used in organic farming in EU Member States and Switzerland in the years 2014, 2015 and 2016 (millions of seeds)*

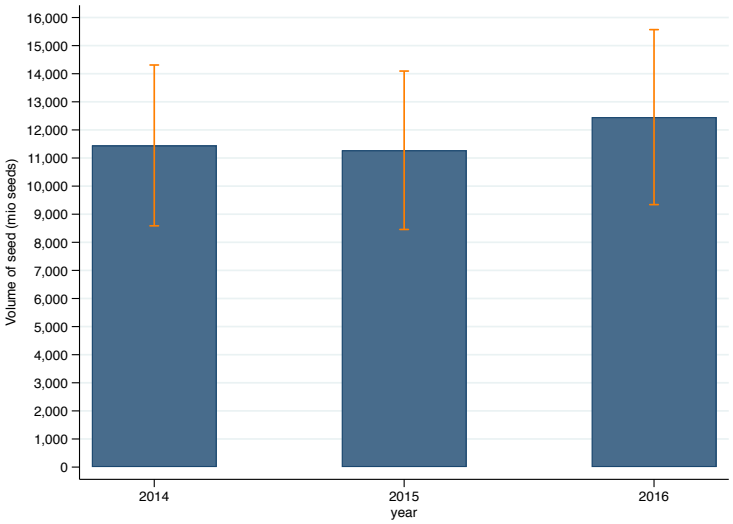
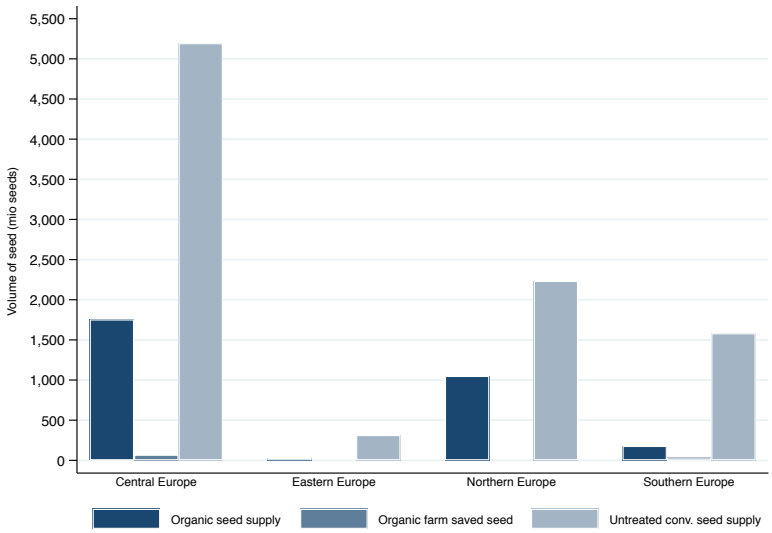


Figure 15 illustrates the estimated demand of organic carrot seed in the EU and Switzerland. In 2016, the potential seed demand in terms of volume of seed required by European organic farmers was 12,455 millions of seeds, ranging from a minimum of about 9,341 millions to a maximum of about 15,569 millions.

***Figure 16** – Estimated **amount** of carrot seed used in organic farming in EU Member States and Switzerland in 2016 by EU regions (millions of seeds)*

Figure 16 shows the estimated amount of carrot seed used in organic farming in EU Member States and Switzerland, by EU regions. The share of non-organic untreated seed was relatively high in all EU regions: 91% in Eastern Europe, 88% in Southern Europe, 74% in Central Europe, and 68% in Northern Europe.



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Onion (*Allium cepa, proliferum, fistolosum*)

***Figure 17** – Estimated **demand** of onion seed used in organic farming in EU Member States and Switzerland in the years 2014, 2015 and 2016 (millions of seeds)*

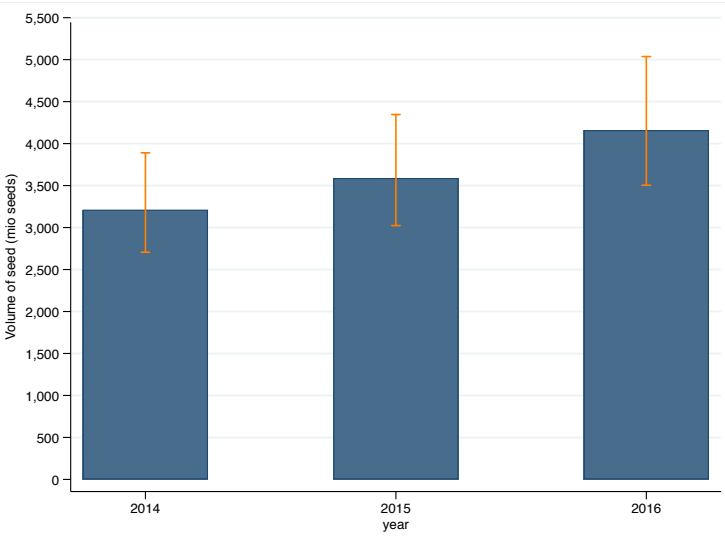
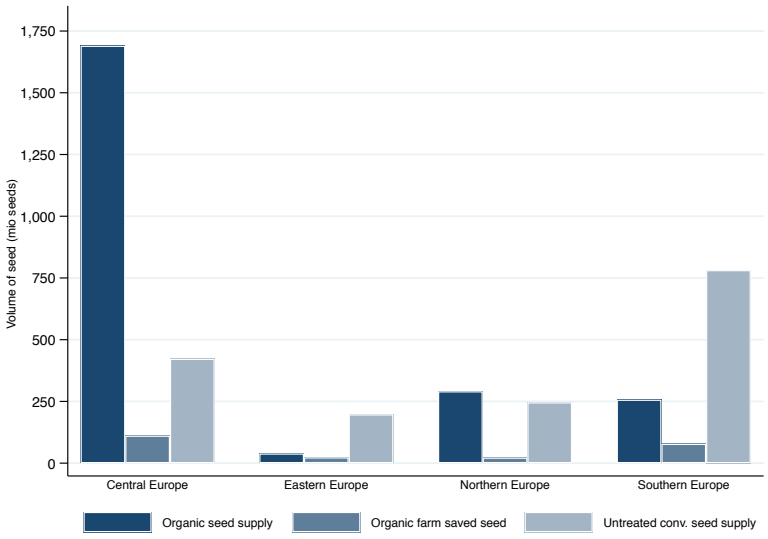


Figure 17 illustrates the estimated demand of organic onion seed in the EU and Switzerland. In 2016, the potential seed demand in terms of volume of seed required by European organic farmers was 4,161 millions of seeds, ranging from a minimum of 3,504 millions to a maximum of 5,037 millions.

***Figure 18** – Estimated **amount** of onion seed used in organic farming in EU Member States and Switzerland in 2016 by EU regions (millions of seeds)*

Figure 18 shows the estimated amount of onion seed used in organic farming in EU Member States and Switzerland, by EU regions. The highest share of organic seed supply was in Central and Northern Europe with 76% and 52%, respectively. Eastern and Southern Europe showed the highest share of non-organic untreated seed with 76% and 70%, respectively.



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Tomato (*Solanum lycopersicum*)

***Figure 19** – Estimated **demand** of tomato plants used in organic farming in EU Member States and Switzerland in the years 2014, 2015 and 2016 (millions of plants)*

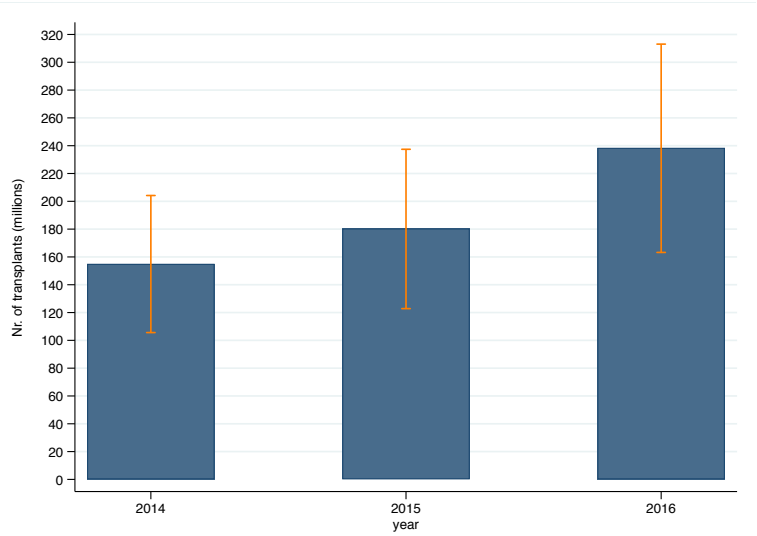
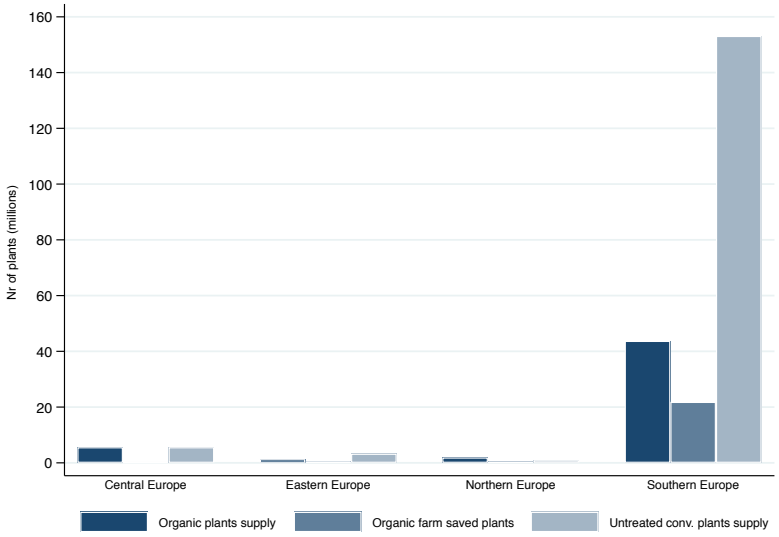


Figure 19 illustrates the estimated demand of organic tomato plants in the EU and Switzerland. In 2016, the potential seed demand in terms of millions of plants required by European organic farmers was about 238, ranging from a minimum of about 163 to a maximum of about 313.

***Figure 20** – Estimated **demand and supply** of tomatoes plants used in organic farming in EU Member States and Switzerland in 2016 by EU regions (millions of plants)*

Figure 20 shows the estimated amount of tomato plants used in organic farming in EU Member States and Switzerland by EU regions. In Southern Europe, where most of the tomatoes were grown, the share of organic plants was approximately 20%, while the share of non-organic untreated plants was nearly 70%.



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Fruits and berries

Apple (*Malus domestica*)

***Figure 21** – Estimated **demand** of apple plants used in organic farming in EU Member States and Switzerland in the years 2014, 2015 and 2016 (millions of plants)*

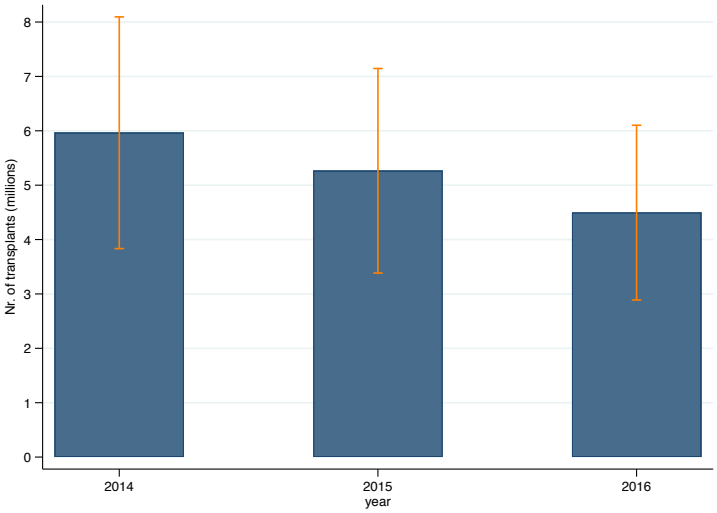
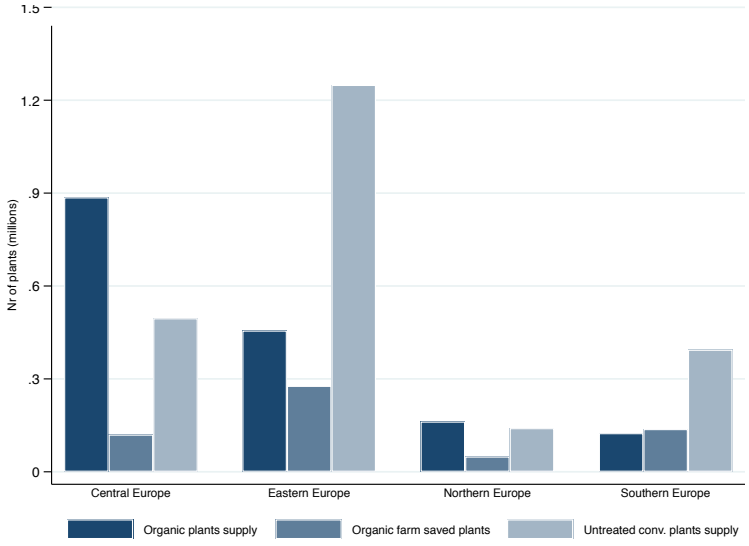


Figure 21 illustrates the estimated demand of organic apple plants in the EU and Switzerland. In 2016 the potential demand in terms of millions of plants required by European organic farmers was about 4.5, ranging from a minimum of about 2.9 to a maximum of about 6.1.[1]

***Figure 22** – Estimated **amount** of apple plants used in organic farming in EU Member States and Switzerland in 2016 by EU regions (millions of plants)*

Figure 22 shows the estimated amount of apple plants used in organic farming in EU Member States and Switzerland by EU regions. The highest share of organic plants supply was in Central Europe with approximately 59%, followed by Northern and Eastern Europe with 46% and 23%, respectively. Southern Europe showed the lowest share of organic plants supply (19%).



[1] In the period from 2014 to 2016, the estimated demand of apple plants decreased of about 25%. This is mostly due to the decreasing in Poland's organic apple area registered in the same period.

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Strawberry (*Fragraria x ananassa*)

***Figure 23** – Estimated **demand** of strawberry plants used in organic farming in EU Member States and Switzerland in the years 2014, 2015 and 2016 (millions of plants)*

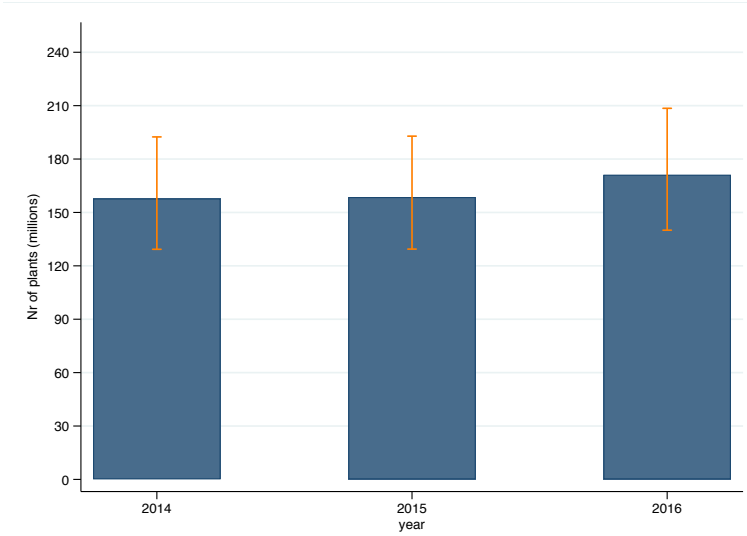
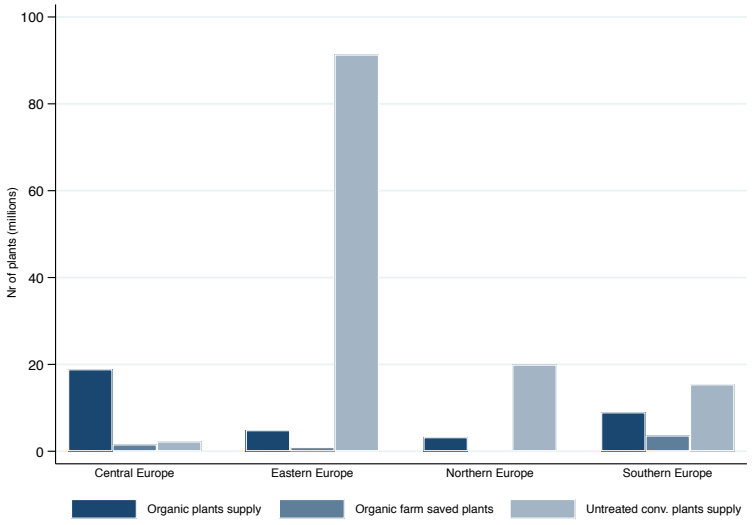


Figure 23 illustrates the estimated demand of organic strawberry plants in the EU and Switzerland. In 2016, the potential seed demand in terms of millions of plants required by European organic farmers was about 171, ranging from a minimum of about 140 to a maximum of about 208.

***Figure 24** – Estimated **amount** of strawberry plants used in organic farming in EU Member States and Switzerland in 2016 by EU regions (millions of plants)*

Figure 24 shows the estimated amount of strawberry plants used in organic farming in EU Member States and Switzerland by EU regions. The highest share of organic plants supply was in Central Europe with approximately 83%. In Eastern Europe, where most of the strawberries were grown, the share of organic plants was less than 6%.



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Methodological note

To analyze the current supply and demand of organic seed in Europe, innovative approaches were developed and tested within the EU funded project LIVESEED to improve the data collection and analysis, with special reference to the potential seed demand and the organic seed use rate.

The first step in the analysis was to estimate the amount of seed and propagation materials that would be needed for each crop if all organic farmers in EU and Switzerland were using only organic seed for their crops (i.e. the potential organic seed demand). This was done by combining data on the organic land area [2] with the estimated average seeding rate [3]. Subsequently, results of a farmer survey, validated with further expert assessment [4], were used to estimate the share of the overall potential seed demand which is covered by organic certified seed supply, non-organic untreated seed supply and organic farm-saved seed.

Countries included in the analysis were grouped into four geographical regions as follows:

- Eastern Europe includes Bulgaria, Czechia, Hungary, Poland, Romania, Slovakia.
- Central Europe includes Austria, Belgium, France, Germany, Luxembourg, Netherlands, Switzerland.
- Northern Europe includes Denmark, Estonia, Finland, Ireland, Latvia, Lithuania, Sweden, United Kingdom.
- Southern Europe includes Croatia, Cyprus, Greece, Italy, Malta, Portugal, Slovenia, Spain.

Minimum, average and maximum organic seed demand estimates indicated in the Figures are based on the minimum, average and maximum organic seed rate, respectively.

Further information

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[2] Data on organic crop land was obtained by the FiBL-CH database. As the dataset showed a high rate of missing values, particularly for vegetables and forages in some EU Member States, multiple imputations (MI) methodology was used to estimate the missing data.

[3] Crop seed rate for each crop and EU region was obtained through a literature review and validated by an experts survey conducted under the LIVESEED project.

[4] Organic seed use (i.e. organic seed supply) at farm level was estimated through a farmers' survey involving 839 farmers across 17 EU countries. Further expert interviews were then conducted to validate this data to refine the estimation of the amount of organic seed currently used in the EU Member States and Switzerland.

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