



Factsheet on war in Ukraine & supply situation

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The war Putin is waging against Ukraine is a disaster in terms of humanitarian and international law. It is existential that and how the European Union acts here together with the allies. The acts of war are costing more and more lives and forcing women and children to flee. In addition, there are serious consequences for the agricultural sector in Ukraine, which further endangers food security there. Food security in many developing countries is also under massive strain, especially among those who have long been dependent on wheat imports from Ukraine or Russia, for example, or in need of international aid.

Regarding the current attempts to use the war in Ukraine to use the rhetorical buzzword of "food security" to question the goals of the important agricultural transformation of the EU's farm-to-fork and biodiversity strategies under the Green Deal, we can only say that we consider them infamous.

The first priority must now be acute aid to secure food supplies, as well as measures for global food security, so markets must be kept open, especially to avoid crop and supply shortfalls and to ensure sowings for future food security. Feed supplies for live animals in Ukraine, for example, must also be secured.

However, at the same time, we must also question the efficiency of our use of resources. This applies to fertilizers as well as the massive use of agricultural land for feed instead of food and the use of agricultural products for energy production (agrofuels).

We hereby take a stand on the current discussion about an allegedly necessary rollback towards further intensification of agriculture. We consider this to be a serious mistake, as it would mean further fueling the climate and species crisis. Already, the overexploitation and pollution of our natural resources - air, water, soil - and the loss of biodiversity are leading directly and indirectly to yield losses and declines, with all the known consequences.

We must now provide acute relief while thinking about tomorrow's food security.

In this factsheet, we want to give an overview of where we stand in terms of supply in the current situation. In particular, we assess the production, trade and utilization relationships between the "4 Fs" - Food, Feed, Fertilizer, Fuel - because these are intertwined in many ways. Cereals, oilseeds and protein crops are nowadays among the so-called "[flex crops](#)" that can be used for any of the 4 Fs.



Political context/background information:

EU Agriculture Commissioner Janusz Wojciechowski had indicated shortly after the Russian invasion of Ukraine that he sees a need for corrections to the Green Deal/farm-to-fork strategy in order not to jeopardize food supplies ([link](#)). Commission President Frans Timmermans, on the other hand, warned against relaxation ([link](#)). 85 non-governmental organizations have responded with an Open Letter to EU Commissioners ([link](#)). Even if the EU Commissioner has retracted his statements: The demand remains, also from many professional associations in Germany ([link](#)).

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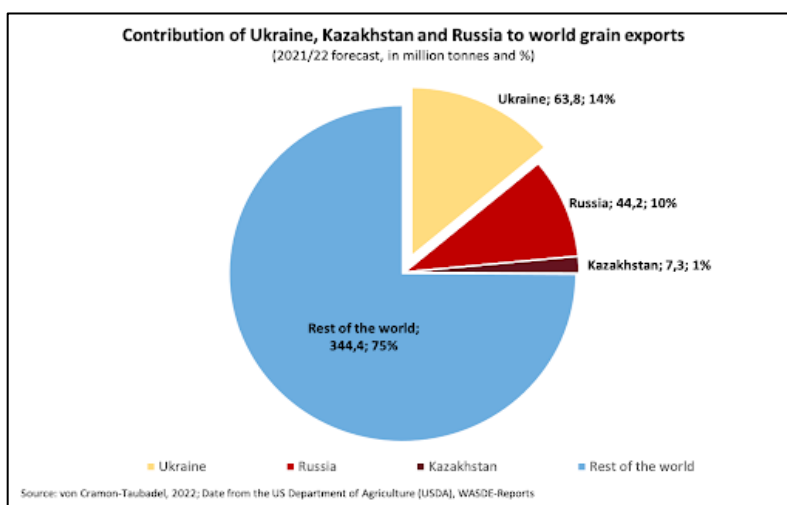


Agricultural production share of Ukraine and Russia in the world market

Ukraine is a large supplier of wheat, corn, sunflower seeds and sunflower oil for both food and feed. It provides 15% of the world corn market, 15% of the world barley market, 10% of the world wheat market, and 50% of the world sunflower oil market ([GMK Center](#) & [FAO Information Note](#)).

In the grain market, the three countries Ukraine, Kazakhstan, and Russia supply about a quarter of the world market supply.

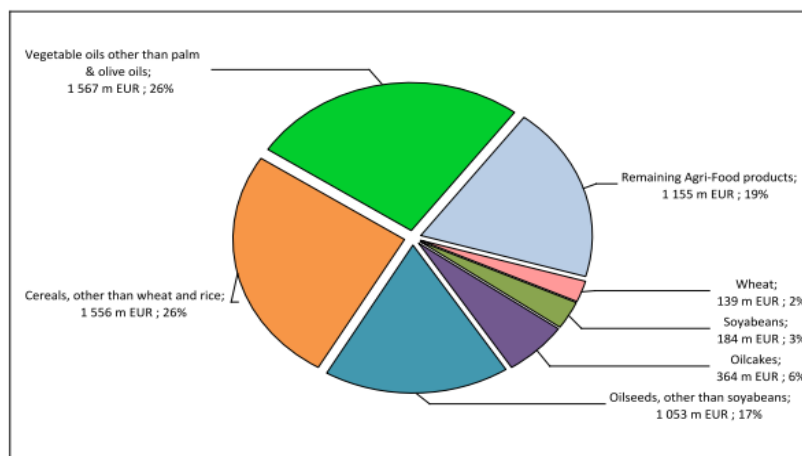
Contribution of Ukraine, Kazakhstan, and Russia to world grain exports



Source: [Lakner 2022](#)

EU agricultural imports from Ukraine

Top EU Agri-Food imports from Ukraine in 2020



Source: [ARC2020](#)



Current situation of agriculture in Ukraine

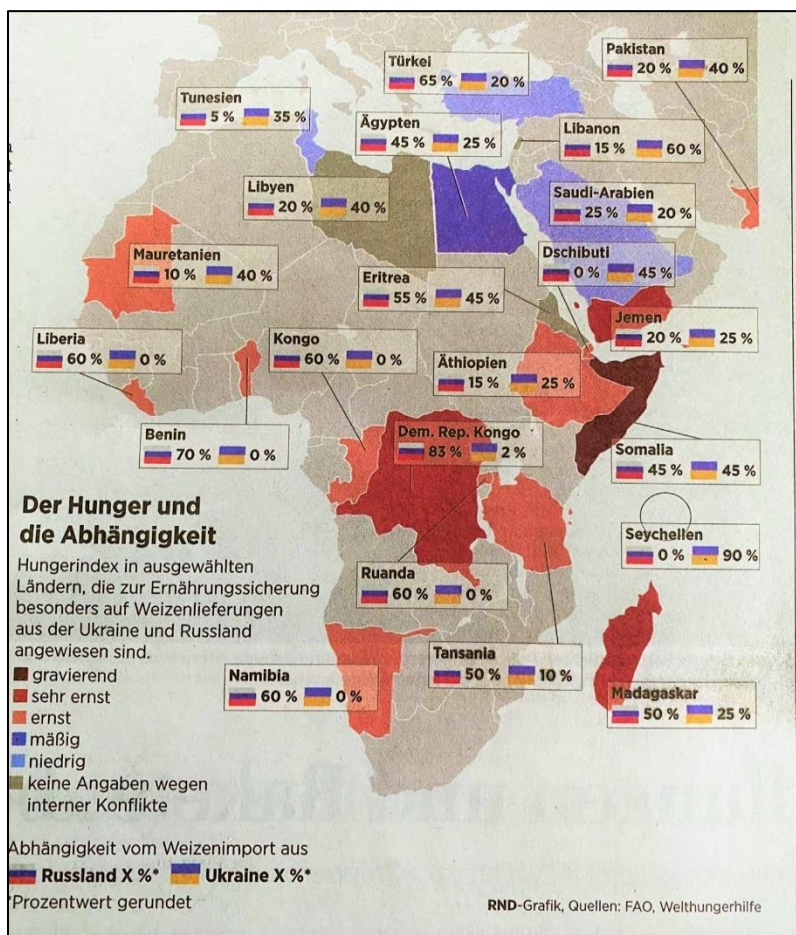
Ukraine's agricultural production has been severely affected by the Russian invasion. The war is causing significant problems in logistics and food supply chains. The ten regions where military operations are currently taking place [account for 54% of the sowing area for sunflowers and 42% and 52% for corn and wheat](#), respectively, so Ukrainian farmers will not be able to start planting crops in the coming weeks; in other regions, sowing is not possible due to gasoline shortages. All this puts the 2022 harvest in Ukraine at risk.

Export restrictions Russia

Russia announced in mid-March that it would restrict exports of wheat, barley, rye, and other grains. While less affected for Europe, this decision mainly affects the Middle East and North Africa.

Impact on the EU and the world

The loss of exports is likely to affect developing countries in particular. In 2020, for example, around 40 percent of the wheat consumed in Egypt, Turkey, Azerbaijan and Sudan came from Russia, according to UN figures.



Source: [Lakner](#)

Lighthouse Reports published this helpful [thread](#), which also includes a food security index (see [here](#) for a comprehensive assessment of some geopolitical realignments).



The European Union is affected in certain sub-sectors but is by no means in a supply crisis. One example is salad oil from rapeseed or sunflower, where Ukraine's import share to the EU is around 80%. Another example is GMO-free soy from Ukraine for the organic sector. Overall, however, the food supply situation in the EU is not at risk.

Nevertheless, Europe and North America are embedded in an agrifood and global commodity trading system that is highly dependent on fertilizers for crop growth, fossil fuels (gas) to produce these fertilizers, as well as animal feed and crops for agrofuels. This makes the EU defiantly vulnerable to dislocations.

Areas, harvest volumes and use of cereals, oil and protein crops in the EU

The EU is more than 100% self-sufficient in many areas, so we are net exporters of some agricultural commodities.

Areas and harvest volumes as well as imports and exports for wheat and cereals EU

CEREALS SUPPLY & DEMAND

Thousand metric tonnes

| LAST UPDATED: 27/02/2020 | 2015/16 | | 2016/17 | | 2017/18 | | 2018/19 | | 2019/20 fc | |
|--------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | Wheat ** | TOTAL CEREALS | Wheat ** | TOTAL CEREALS | Wheat ** | TOTAL CEREALS | Wheat ** | TOTAL CEREALS | Wheat ** | TOTAL CEREALS |
| Beginning stocks | 8.914 | 37.262 | 11.832 | 34.939 | 8.990 | 30.103 | 15.444 | 38.898 | 9.658 | 38.635 |
| Usable production | 143.311 | 287.134 | 129.211 | 274.912 | 136.023 | 282.449 | 123.746 | 269.262 | 138.752 | 294.543 |
| Area (thousand ha) | 24.929 | 54.174 | 25.200 | 53.655 | 24.139 | 52.011 | 23.752 | 51.940 | 24.155 | 54.443 |
| Yield (tonnes/ha) | 5,7 | 5,3 | 5,1 | 5,1 | 5,6 | 5,4 | 5,2 | 5,2 | 5,7 | 5,4 |
| Imports (from third countries) | 8.452 | 23.445 | 5.941 | 20.536 | 5.716 | 25.039 | 5.406 | 30.156 | 5.000 | 26.912 |
| Total supply | 160.677 | 347.841 | 146.984 | 330.387 | 150.729 | 337.591 | 144.596 | 338.316 | 153.410 | 360.089 |
| Total domestic use | 114.495 | 261.538 | 110.809 | 260.894 | 111.640 | 263.067 | 111.557 | 263.816 | 110.977 | 263.823 |
| Human consumption | 49.221 | 58.486 | 49.362 | 58.648 | 49.456 | 58.921 | 49.537 | 58.801 | 49.532 | 58.809 |
| Seed | 4.718 | 8.976 | 4.720 | 8.944 | 5.063 | 9.312 | 5.007 | 9.113 | 5.000 | 9.076 |
| Industrial uses | 10.657 | 30.513 | 10.196 | 30.627 | 10.306 | 31.034 | 10.427 | 31.158 | 10.412 | 31.220 |
| of which bioethanol/biofuel | 4.500 | 11.595 | 3.941 | 11.443 | 4.200 | 11.952 | 4.349 | 12.254 | 4.349 | 12.554 |
| Animal feed | 48.959 | 161.353 | 45.591 | 160.465 | 45.874 | 161.589 | 45.646 | 162.534 | 45.200 | 162.950 |
| Losses | 940 | 2.210 | 940 | 2.210 | 940 | 2.210 | 940 | 2.210 | 833 | 1.767 |
| Exports (to third countries) | 34.350 | 51.364 | 27.186 | 39.390 | 23.645 | 35.626 | 23.382 | 35.865 | 29.233 | 44.951 |
| Total use | 148.846 | 312.902 | 137.995 | 300.284 | 135.285 | 298.693 | 134.938 | 299.681 | 140.210 | 308.774 |
| Ending stocks**** | 11.832 | 34.939 | 8.990 | 30.103 | 15.444 | 38.898 | 9.658 | 38.635 | 13.200 | 51.315 |
| Change in stocks**** | 2.918 | -2.323 | -2.842 | -4.836 | 6.455 | 8.795 | -5.786 | -263 | 3.542 | 12.680 |

** Marketing year: from July to June

** Wheat = common wheat + durum wheat

*** Coarse grains = barley + maize + rye + sorghum + oats + triticale + other grains

**** At the end of the marketing year

Quelle:

<https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/overviews/market-observations/crops>

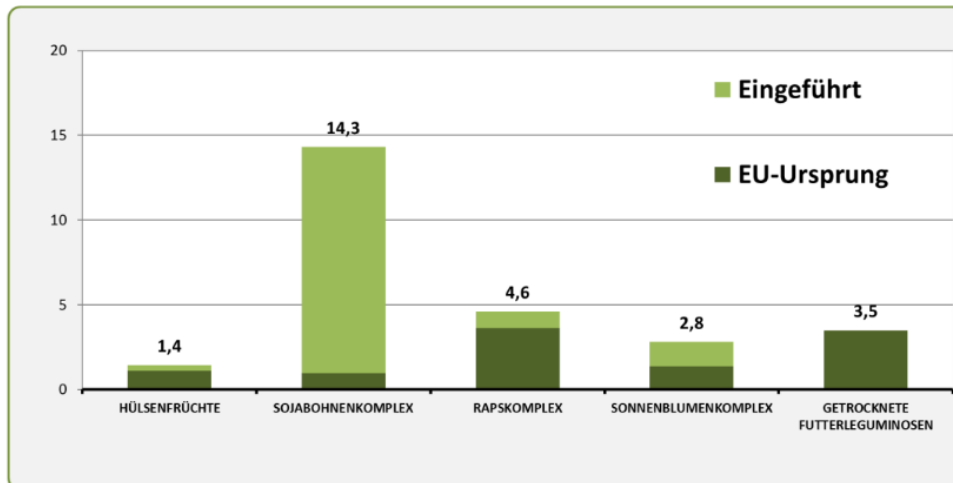
Source: BLE [Cereals Market and Supply Situation, Report 2020](#)



Protein crops and where they come from

The [Commission's 2018 report](#) on the development of plant proteins in the European Union lists the following figures:

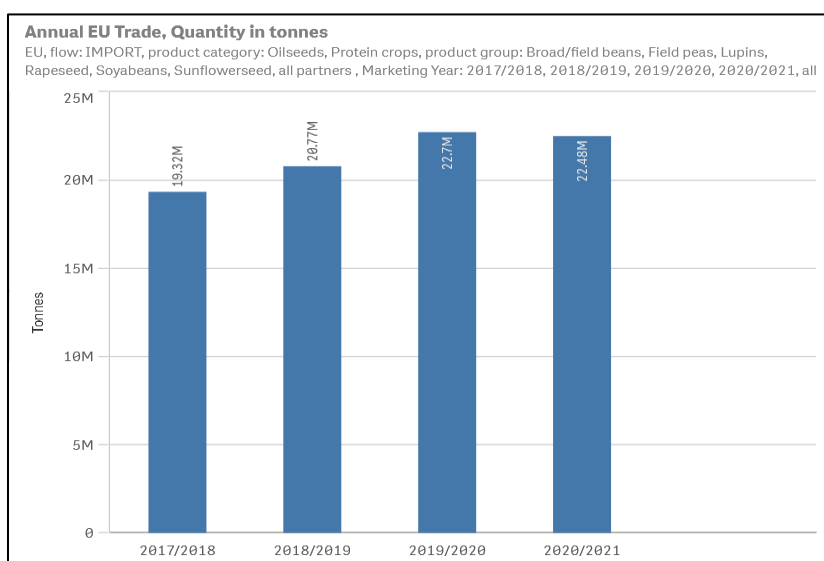
Origin of proteins in the EU 2016/2017 (in million tons of crude protein)



Quelle: EU-Kommission. „Komplex“ beinhaltet Mehle, Samen und Bohnen.

The EU's self-sufficiency level in 2017 varied depending on the protein source (rapeseed 79%, sunflower 42%, soybeans 5%). Therefore, the EU imported about 17 million tons of crude protein annually (13 million tons of which are based on soybeans, equivalent to 30 million tons of soybean equivalents), mainly from Brazil, Argentina and the U.S., the value has increased between 2017 and 2020. The EU also imports 1.5 million tons of crude protein from sunflower and up to one million tons of rapeseed, both mainly from Ukraine.

Imports of oil and protein crops EU - increase 2017-2021



Source: [EU-Commission](#)

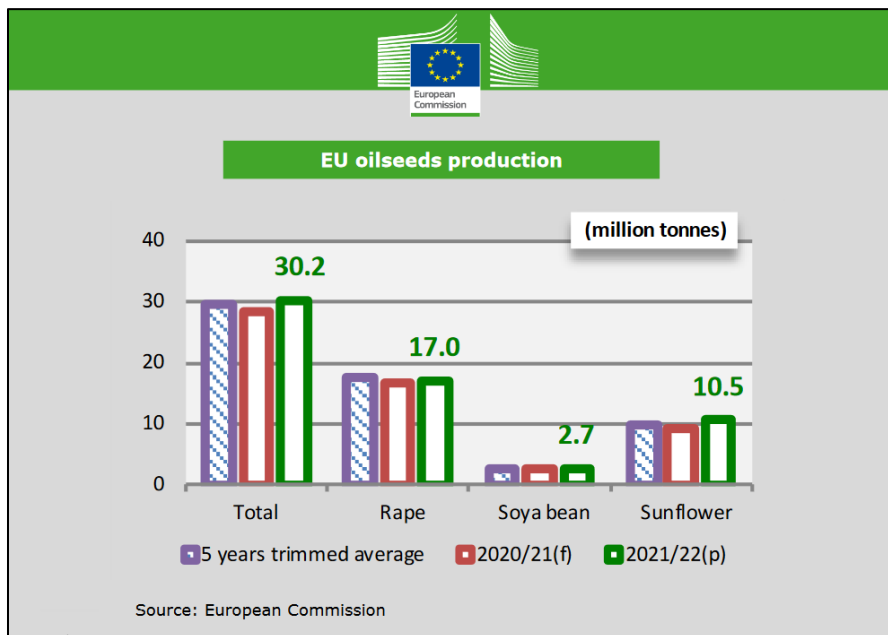


Domestic cultivation protein crops EU

The area under soybean in the EU has doubled since the reform of the Common Agricultural Policy in 2013 to nearly one million hectares with a production of 2.8 million tons (2018). The main producers of soybean are Italy, France and Romania. Legumes show a similar positive trend. Since 2013, EU production has nearly tripled to 6 million tons (2.6 million hectares) in 2018. The most important legumes are field peas and field beans. Lentils and chickpeas, on the other hand, are grown only to a limited extent. France, Spain and Lithuania are the main producers of field peas. Field beans are grown in Great Britain and France. Not to be forgotten are the fine legumes, such as clover and alfalfa, which are utilized via green fodder but are difficult to survey.

The area under rapeseed, the most widely grown oilseed in Europe, grew 66% between 2003 and 2018, from 4.1 to 6.8 million hectares. Production in the EU has reached nearly 20 million tons. It is mainly driven by agrodiesel demand (Renewable Energy Directive). Its by-product (rapeseed meal) is an important source of protein-rich animal feed. The main producers of rapeseed are France, Germany, and Poland.

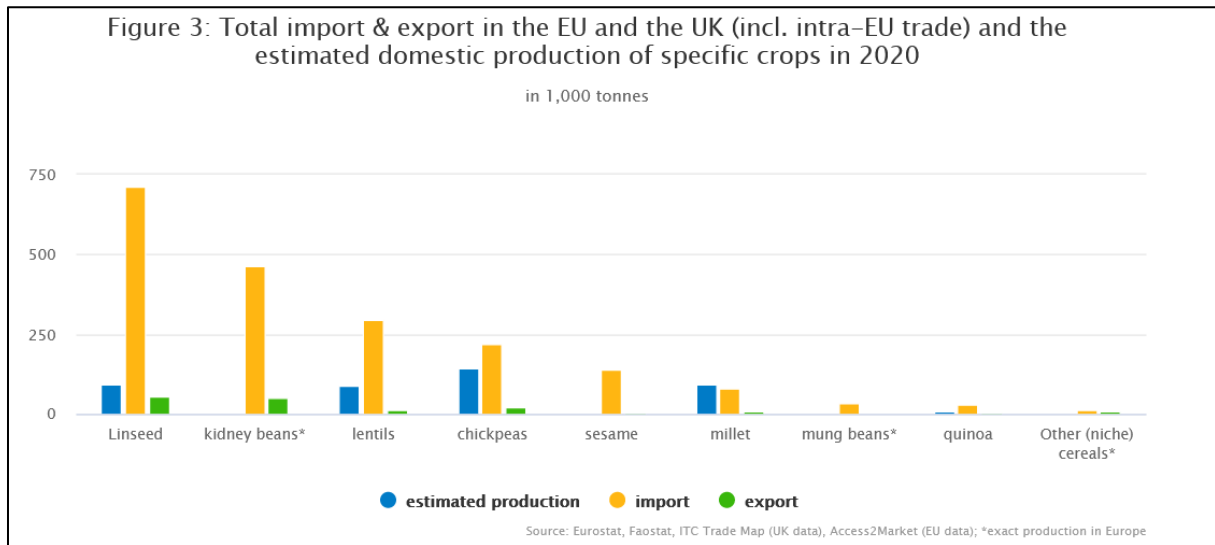
Domestic cultivation of oilseeds 2020 -2022



Source: [EU-Commission](#)



Domestic cultivation (plus UK) of other grain legumes 2020

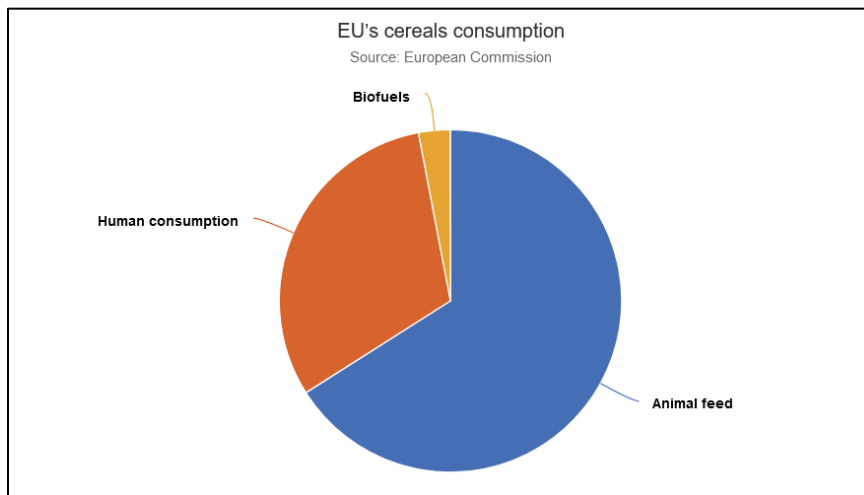


Source: [CBI 2022](#)

Due to the different classification into protein and oil crops and the respective non-uniform categorization, the concrete estimation is difficult.

Use of cereals and oil plants for feed production

Around [two-thirds of EU cereal production and 70% of EU oilseed production](#) is used for animal feed.



It is imperative that we reflect on where grains and oilseeds are predominantly used in the food chain. It is not acceptable that intensive meat production continues to devour a large part of the grain harvest. This has always been neither economically nor ecologically sustainable and must be [put to the test now at the latest](#).

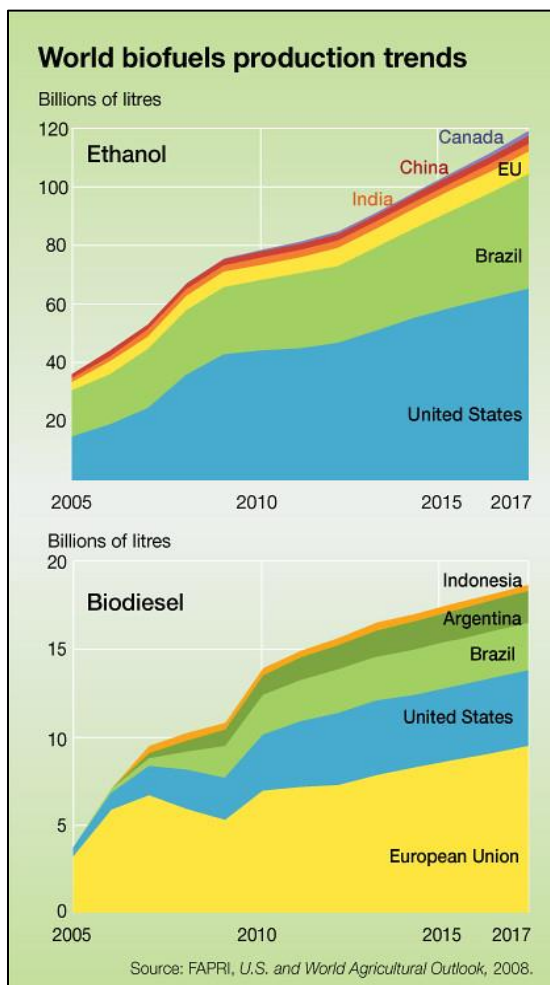


Use of cereals and oil plants for agrofuels

The consequences of agrofuel production for the global food situation have been serious for years: grain prices are rising due to competition between food and agrofuel. Farming families are often displaced to create plantations for the cultivation of energy crops (especially palm oil). **If the land used to produce agrofuels for the EU alone in 2012 (today it is significantly more) were used for the cultivation of wheat and corn, 127 million people would be able to live on it for a whole year, calculated the [NGO Oxfam in 2012](#).**

In view of the looming global food crisis, [Deutsche Umwelthilfe \(DUH\)](#) and [other experts](#) are calling for an immediate halt to the burning of food for so-called agrofuel. In the short term, they say, this is one of the most effective levers for counteracting the expected shortfall of grain and oil crops from Ukraine and Russia and the impending global price shock for basic foodstuffs.

Global agrofuel production ethanol and biodiesel 2005-2017



Although figures show that the majority of EU agrofuel consumption is produced domestically, this production relies heavily on imports of vegetable oils and other feedstocks. [The European Commission](#) estimates that 7.4 million hectares of land were required to produce crops for agrofuel consumption in the EU in 2018. Of this, 3.4 million hectares (46%) were within the EU and 3.8 million hectares (51%) were outside the EU.

Only a small proportion of ethanol is used in the European fuel mix. Unlike in North and South America, fuel production in the EU is based on agrodiesel.

Tweet Hannah Ritchie 16.03.22

- Head of Research at [@OurWorldinData](#)
- Researcher at [@UniofOxford](#)



Hannah Ritchie
[@_HannahRitchie](#)

 US maize used for biofuels: 120 million tonnes

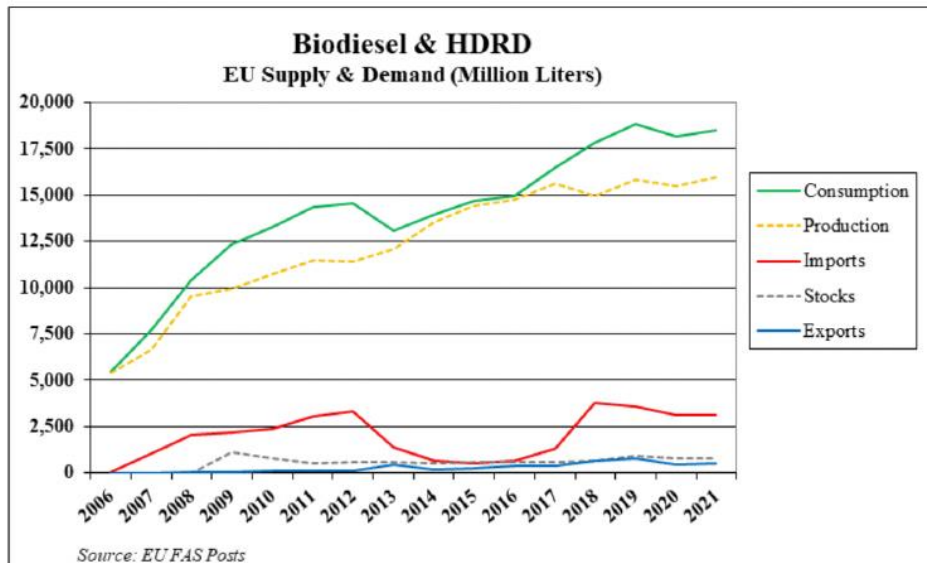
 Maize production of entire African continent: 80 million tonnes

US uses 50% more maize for industrial uses than the African region produces.

<https://ourworldindata.org/explorers/global-food>

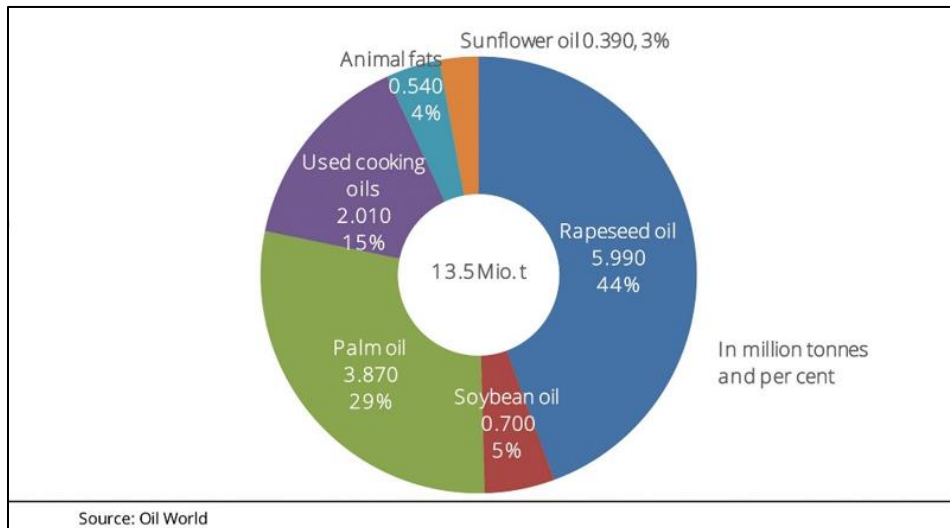


Production, consumption and import of agrodiesel in the EU (+ UK) 2006-2021



Caption: EU here includes the EU27 and the UK. Source: reprinted from "2021 Biofuels Annual Report." Global Agricultural Information Network, United States Department of Agriculture (USDA 2021b).

Share of raw materials for agrodiesel in the EU 28 2017



For more than 15 years, plant-based fuels, primarily from rapeseed and palm oil, have been blended with fossil diesel in Europe. These agrofuels currently account for by far the largest share of non-fossil energy in transport. The cultivation of the required plants requires immense areas of land and is associated with high climate costs. In principle, food could also be grown on the land occupied.

Sustainability balance questionable

Ten international organizations recommended back in 2011 that G20 governments end the promotion of "biofuel". The G20 governments should "remove from their national policies those provisions that subsidize or mandate the production and consumption of biofuels," the authors

wrote verbatim. These include the World Food Programme (WFP) and the Food and Agriculture Organization (FAO) of the United Nations, the World Bank, the Organization for Economic Cooperation and Development in Europe (OECD) and six other international institutions ([BESTE 2021](#)).

A new [study by the ifeu Institute](#) commissioned by Deutsche Umwelthilfe shows that the use of **agrofuels made from food and feed crops does not benefit the climate, but actually harms it**. And it is not only from a climate perspective that making valuable land available for agrofuels is a bad choice, because their intensive cultivation also damages ecosystems and biodiversity.

Land requirements Germany

Almost half a million hectares are occupied by agricultural land for agrofuel in Germany alone - equivalent to almost twice the area of Luxembourg. In addition, Germany imports large quantities of vegetable fuel from abroad, so that more than 1.2 million hectares worldwide are used to produce agrofuel for German filling stations.

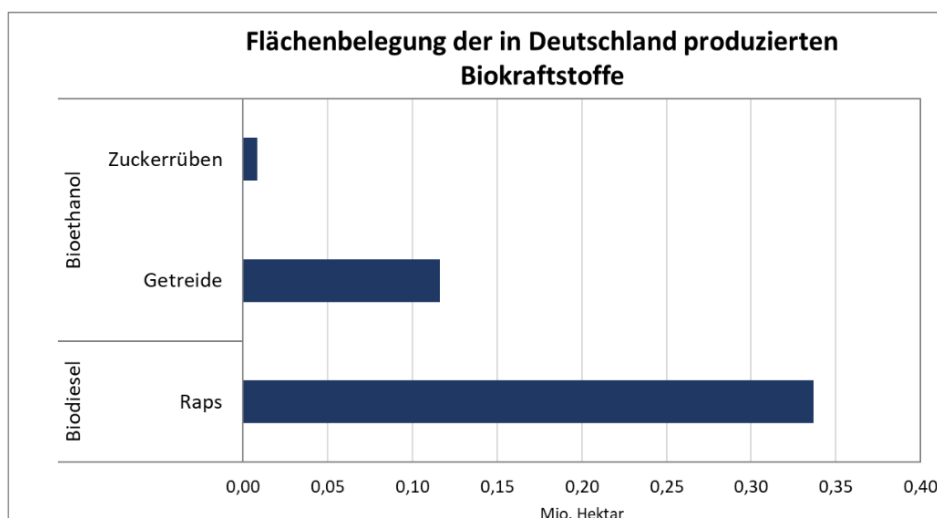
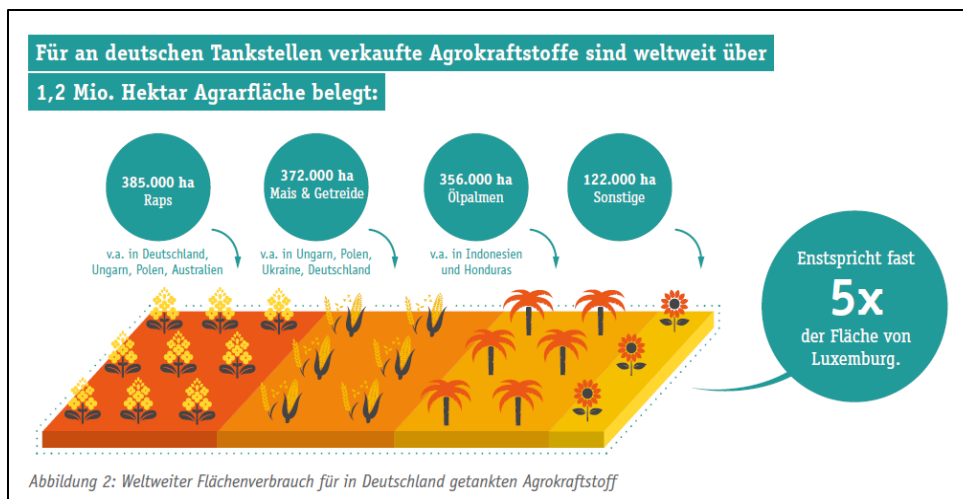


Abbildung 4: Flächenbelegung der in Deutschland in 2020 produzierten Anbau-Biokraftstoffe (Quelle: Berechnungen des ifeu auf Basis von Daten von (FNR 2021a), (ifeu o.J.))



The demand to stop Green Deal and F2F strategy is against all scientific expertise

The calls that have been made in recent weeks

- to allow protein crops to be grown on fallow land, including pesticide treatment and plowing,
- to allow the use of pesticides in emergencies, including in areas that are supposed to be protected by CAP conditionality,
- a revision of the recently submitted CAP plans (Italy and Slovakia),
- a review of the "Farm to Fork" strategy and adaptation, if necessary (further slowing down of implementation),

all emanate from supporters and profiteers of the agribusiness model or their stakeholders (IVA, Copa/Cogeca, Grain Club, feed industry, meat industry, EPP/CDU/CSU, Renew/FDP) and **would lead to a [collapse of ecosystems](#) in the medium and long term**. Under the guise of a very specific interpretation of "food sovereignty", the French Farmers' Federation (FNSEA), among others, has issued a [communiqué](#) stating that the "logic of growth decline as envisaged by the European "from producer to consumer" strategy must be deeply questioned", while **criticizing the fact that 4% of land is earmarked for unproductive land under the CAP**.

Not only according to Timmermanns, the Commissioner primarily responsible for the [Green Deal](#), would it be a "historic mistake" if the EU were now to slow down or even completely bury its sustainability projects. Countless scientific studies, expert opinions and statements by European institutions, such as the European Court of Auditors, also prove that sustainable, long-term food sovereignty and security is only possible with a greening of the agricultural model ([Dege et al. 2021, p. 40](#)).

In an [open letter to EU Commissioners](#), 85 NGOs have once again emphasized that a departure from the Green Deal is not expedient. **Dr. Guy Pe'er, Prof. Sebastian Lakner and Dr. Jeroen Candel, 3 renowned agricultural researchers from the UFZ - Helmholtz Centre for Environmental Research, the University of Rostock and the University of Wageningen have also written an [open letter](#) to the EU Commission** in which they address the connection between the Ukraine war and the biodiversity and climate crisis.

It states, "Any response to the shocking effects of the invasion of Ukraine, must bear the greater risks in mind... We strongly argue that one should avoid false dichotomies between food security and environmental sustainability, responding wisely to the shock while keeping the larger challenges in mind. We also reject the productionist discourse that equates food security with the further intensification of production."

In particular, they argue that further intensification will exacerbate problems - for soil, water, pollination and pest control. They also question *"the validity of COMAGRI's proposal to open Ecological Focus Areas (EFA) for production."* This, they say, will do little but cause great damage to ecosystems.

The trio argues that more thought should be given to how we achieve optimal food crop allocation to ensure that people's basic needs take priority over less important uses. Demand also matters, they



stress. Demand for feed in the EU affects world markets, they say, while the EU also uses more than 70% of its arable land to produce feed and fuel; some of that acreage could be used more wisely to address food shortages in developing countries.

Another [statement by 300 scientists](#), including from the PIK Potsdam Institute for Climate Impact Research, also calls for a transformation of the food system: less meat and food waste, more legumes and a greener agricultural policy.

Note on the term 'food sovereignty'

Originally, the term 'food sovereignty' goes back to the "right to food" enshrined as a human right under international law in the UN Social Covenant. It is also included in Article 25 of the Universal Declaration of Human Rights. In 2000, the World Food Summit called on states to develop voluntary guidelines on the 'right to food' and its implementation. The "[International Guidelines on the Human Right to Food](#)" were unanimously adopted by all FAO members (187 states) in 2004. According to the guidelines, the right to food includes self-determined choice of food system and equal access to healthy food, regardless of income and origin. However, the right to food also includes the right of people and governments to take action against environmental, economic or social forms of dumping and to develop their own sustainable food systems.

What are the benefits of releasing ecological priority areas (4%) for cultivation?

To better understand what impact this measure could have on the amount of grain produced worldwide and the world market price for grain, [the Heinrich Böll Foundation had the effects calculated](#). The regulations of the new CAP support period would come into force in January 2023. The present calculations thus depict scenarios for the 2022/23 marketing year. This estimate was based on the most recent FAO data available online for 2019, and it is not likely that land use has fundamentally changed in the last two years. Therefore, the estimates based on 2019 data are transferable in magnitude to the current situation. In 2019, about 6% of the "arable land" in the EU was set-aside, including the ecological priority areas required under greening (new CAP: "non-productive land", the old CAP term "ecological priority areas" is technically more accurate, but not congruent with the currently required 4%, because protein crop cultivation was still allowed under the old scheme). The results therefore overestimate the production potential.

If all current fallow land in the EU were included in production, cereal production would be up to 4.4% higher. Measured against global production, this would be up to 0.4%. EU wheat production would be up to 3.8% higher, resulting in a global production increase of up to 0.7%. Neither the quality of the soil nor the possible scarcity of water and other resources were included in this calculation, so it is very conservatively calculated because most of this land is not suitable for intensive production at all.

To this end, it is important to know that the 4% "set-aside" planned as an ecological retreat area is rather low in view of the major challenges, we face in the area of urgent biodiversity protection. [The EU Commission's biodiversity strategy](#) calls for 10% non-productive areas ("landscape elements with high biodiversity"), and [300 scientists in Germany alone](#), many of them advisory boards to the German government, are also calling for this. These areas are not luxury areas, they serve to create



habitats for wild herbs, bees and birds and are urgently needed to stabilize our ecosystems and thus also enable secure harvests in the long term. **The status quo according to the [IPCC and IPBES report](#), published on the same day that Russia's invasion of Ukraine began, shows a clear trend of declining productivity due to ecological impoverishment and the collapse of agroecosystems** (see also [Hallmann 2017](#)).

Critics of the EU's shift away from environmental considerations have also pointed out that the EU is already **112% self-sufficient in cereals** and exports more than twice its cereal imports (see above).

Prices and Speculation

Possible price increases in the EU are [difficult to estimate](#), it depends on the duration of the war. Currently, wheat is already trading for more than EUR 400/t, the usual prices are around EUR 200/t. Already last year prices had risen slightly to EUR 250; thus, the supply problems described meet an already slightly tight market situation.

Agricultural markets have always been subject to price fluctuations. **However, since agricultural liberalization has been pushed forward multilaterally and stocks have been reduced, their effects have been felt more clearly than ever before. World agricultural markets have since become "financialized"**, meaning that the laws of the financial markets and the motives of financial players increasingly determine and drive the prices of foodstuffs such as wheat, corn, soybeans, sugar, coffee and cocoa. Speculation with petroleum also drives food prices, since industrial agriculture depends very heavily on fertilizers produced with fossil energy.

Price increase 2007/2008

According to [studies by FAO, the World Bank, UNCTAD and the International Food Policy Research Institute \(IFPRI\)](#), financial speculators drove up grain prices in 2007/2008. Maize prices rose 100 percent in Ethiopia, 65 percent in Uganda and 54 percent in Tanzania. Wheat prices rose 300 percent in Somalia, 100 percent in Senegal and 90 percent in Sudan. Food became unaffordable for many families. Rapidly rising food prices led to hunger protests in 61 countries. The number of hungry people rose by more than 100 million, exceeding a record one billion people for the first time in 2009.

These mechanisms are also at work in the current situation, making it difficult even for economists and trade experts to predict prices in the near future. Ultimately, the mechanisms behind food speculation are opaque, their consequences unpredictable. They can no longer be explained by fluctuations in supply and demand in the real economy. That is why this type of financial transaction needs to be more tightly controlled.

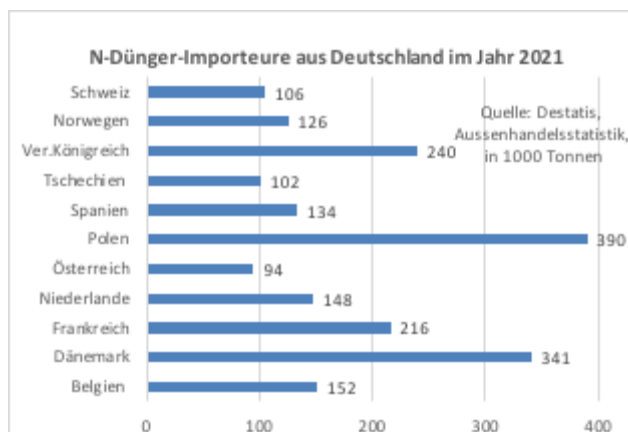
N fertilizers - Germany: No shortage but high prices

But [fertilizer factories](#) located in Germany apparently produce more nitrogen fertilizer themselves than farmers in this country consume - at least that's what the official trade statistics from Destatis say. It should be borne in mind that the [manufacturers are generally international groups](#), such as Yara, which export all over the world anyway.



Nevertheless: **Germany is a net exporter of N fertilizers.** German trade statistics show exports of 3.2 million tons of nitrogen fertilizers from Germany in 2021. This compares with imports of 2.7 million tons - an export surplus of 500,000 tons of nitrogen fertilizer in product weight after all. The vast majority of N fertilizer is traded with other EU countries: The main export customers are Poland, Denmark, Sweden, France, Belgium, Spain and the Czech Republic.

Outside the EU, German-based manufacturers sell the largest volumes to the United Kingdom, Switzerland, Norway, South Africa and Brazil. The largest import volumes to Germany do not come so much from Russia - but rather also from other EU countries such as the Netherlands, the Czech Republic, Belgium, Poland and also Austria and Slovakia. **Russia does not play a decisive role for Germany as a direct supplier of N fertilizer** - it supplies about as much N fertilizer as France or about half as much as Austria.



Source: [agrarheute](https://www.agrarheute.de)

There is no shortage of potash either. [Kali & Salz AG \(K+S\)](https://www.kali-salz-ag.com) is one of the world's leading producers.

Prices for N fertilizers are very closely linked to energy prices (gas), as Haber-Bosch synthesis is very energy-intensive.

Indirectly, as a catalyst for global price development, the weight of Russia is therefore quite high. Russia is one of the world's largest suppliers of fertilizers and related raw materials, including natural gas, potash, and ammonia. Fertilizers were already in short supply before the recent crisis, and costs were rising rapidly.

More independence and performance with agroecological solutions

To secure harvests in the long term and produce sufficient food, we need to increase the efficiency of our natural resources, not the use of inputs such as fertilizers or pesticides. The likelihood that the crisis in Ukraine will also affect agricultural production in Europe is high. This may be directly through the impact on international trade in cereals and the evolution of cereal prices, or indirectly through the prices of nitrogen fertilizers (which are linked to the price of gas).

This should be an argument for accelerating the transition to agriculture that is not so dependent on fossil fuels. There should be an argument for rapid re-integration of cropping and livestock to

maximize biological nitrogen fixation by legumes. Native legumes also have potential as forages, providing multiple benefits (see [BESTE 2011](#)).

Potentials of legumes - more independence, higher ecosystem services

The synthetic N fertilizer supply chain was responsible for an estimated 1.25 Gt CO₂e of emissions in 2018, representing 21.5% of direct emissions from agriculture and 2.4% of global greenhouse gas emissions. This, in turn, is more than the share of global business aviation in the same year. Reducing overall production and use of synthetic N fertilizers offers great mitigation potential, as well as realizable potential for reducing emissions from soils ([Menegat et al 2020](#)).

Example: a field bean yield of four tons per hectare corresponds to 180 kg of mineral nitrogen per hectare. This can save the equivalent energy of 180 l of gasoline or diesel or 480 kg of CO₂ emissions that would be required to produce this amount of mineral fertilizer ([Köpke/Nemecek 2010](#)).

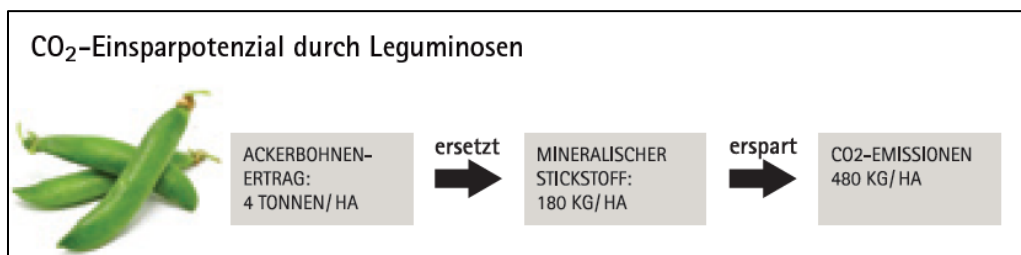


Figure from [BESTE 2011](#)

Building functional biodiversity or agroecological techniques using natural processes can replace functions previously supported by synthetic inputs. **A large number of independent, peer-reviewed scientific studies show that in almost two-thirds of cases, productivity does not decrease in the process, losses are limited to a short transition period, and in some cases productivity even increases ([Tamburini et al. 2020](#), [van der Ploeg et al. 2019](#)).**

This is also cost positive: crop rotation that includes protein crops can also reduce fuel consumption for tillage, as humus and soil moisture content are better maintained, and the soil needs less tillage. A study by the [French General Commissariat for Sustainable Development](#), (CGDD 2009) estimated the potential cost savings in fertilizer use for France alone at 215.628 t or up to EUR 100 million annually ([BESTE 2011](#)).

Legumes can tap phosphate fixed in the soil because they form close bonds with mycorrhizal fungi. Mycorrhizal fungi improve the supply of potassium, copper, zinc and other minerals to crops. They have a barrier effect against harmful root infections and secrete inhibitors against harmful fungal infections. Most importantly, mycorrhizal fungi can unlock phosphates (P) from the soil, improving the P supply to the crop and reducing the need for phosphate fertilizer. However, they are harmed by pesticides and intensive nitrogen fertilization as the fungus is decimated and the root secretions required by the fungus decline and change. Legume cultivation promotes the formation of mycorrhizae and thus also the phosphate supply of the other fruits in mixed crops and the following crop ([Köpke/Nemecek 2010](#)).



Through the roots, legumes supply organic matter with a close carbon/nitrogen ratio (i.e., high carbon content) to the soil. This results in an accumulation of high-quality nutrient and permanent humus. Humus enrichment involves binding CO₂ and activating soil life. Thus, in addition to climate protection, soil fertility is also improved. The rain absorption and water storage capacity of the soil also increase significantly ([BESTE 2011](#)).¹

EU protein strategy for more independence

As early as 2011, an [initiative report by the EU Parliament](#) called on the EU Commission to ensure that sufficient measures and instruments were introduced as part of the then pending reform of the Common Agricultural Policy (CAP) to make the cultivation of legumes more attractive. In 2018, the EU Commission promised to develop a protein strategy. It was to be closely linked to the EU's Farm 2 Fork strategy, which aims to reduce the use of mineral fertilizers by 50% by 2030.

What needs to be done now

Pursue (global) food sovereignty as a priority goal

The more severely affected countries have different options for adjustment: Egypt still has sufficient grain storage of its own for the time being, despite a strong dependence on supplies from the region. In Lebanon, on the other hand, the 2020 port explosion destroyed wheat stocks, reducing storage capacity from six months to one month, so a continuous flow of supplies is needed. Remaining supply gaps that cannot be solved in importing countries through reallocation such as more food rather than energy use require food and also fertilizer assistance.

"Governments must do all they can to ensure food security for Ukrainian citizens and strengthen social protection to protect vulnerable people from rising food prices," said [Olivier De Schutter](#), co-chair of the International Panel of Experts on Sustainable Food Systems (IPES-Food) and U.N. special rapporteur on extreme poverty and human rights.

He said the crisis requires a rethinking of current models for food production and consumption. *"Ultimately, to brace themselves against these shocks, countries must reduce their dependence on imports of a few key agricultural commodities by diversifying their own local food production and food supply chains."*

The [Institute for Sustainable Development and International Relations \(IDDRI\)](#) suggests that in the short term, Europe should seek to curb price inflation, particularly in the Middle East and Africa, as well as other areas.

Much more effort needs to be made overall to increase food self-sufficiency globally and enable countries to secure food supplies for their own populations. The fact that 10% of the world's population is already hungry today is mostly due to structural reasons (poverty, distribution problems, lack of access to land). These cannot be solved by ramping up production in Europe (by reversing set-asides or farming restrictions). Existing narratives ("We have to feed the world") also

¹ See also:

Nemecek, Th. et al. (2008): [Environmental impacts of introducing grain legumes into European crop rotations](#). In: Europ. J. Agronomy 28
Böhm H. et al. (2020): [Fruchtfolgen mit und ohne Leguminosen: ein Review](#). In: [Journal für Kulturpflanzen 10-11](#).



need to be clearly questioned. This also means reducing economic interests that lead to increased dependence on imports.

Germany has a central role to play in this year's G7 presidency. The special meeting convened by the BMEL on March 11, 2022, underscores this will to act. The meeting was also attended by the Ukrainian Minister of Agriculture as well as the World Food Programme (WFP), the Food and Agriculture Organization (FAO), the Organization for Economic Cooperation and Development (OECD) and the Agricultural Market Information System (AMIS).

The [closing statement](#) of the special meeting of the G7 in brief:

G7 agriculture ministers agreed to:

- condemn Russian aggression against the territorial integrity and sovereignty of Ukraine.
- stand in absolute solidarity with Ukraine.
- to ensure food security in Ukraine and help Ukrainian farmers produce enough food.
- to work together to solve transportation problems for food or raw material production.
- to avoid all restrictive signals and measures that limit exports and lead to further price increases.
- urge all countries to keep their food and agricultural markets open.
- not to tolerate artificially inflated prices and to take action against any speculative behavior that threatens food security.
- agree on close monitoring of agricultural markets and strengthen the AMIS market information system.
- continue to pursue its climate and environmental commitments and sustainable development goals in this crisis.
- continue joint cooperation within the G7 with international organizations and financial institutions to ensure global food security, including with humanitarian assistance.
- to declare that they stand together with partners, and in solidarity with the government and people of the UKR.

Prevent financial speculation with food

Stronger control of the financial markets. The Financial Markets Directive adopted in 2014 (MiFID II and its accompanying regulation MiFIR) must be more sharply defined and concretized, but above all finally [implemented consistently](#).

Food first: Shut down production of raw materials for animal feed and fuels

70 percent of the raw materials produced on agricultural land in Europe end up in the tank or trough. The global supply of food can be stabilized and increased much more efficiently by restructuring in these areas. Even if many measures such as the reduction of livestock combined with dietary changes or the expansion of renewable energies will only take effect in the medium and long term, they must be pursued consistently. A change of direction in agrofuel production is also an effective lever for releasing significant amounts of land and quantities of grain and corn for food supply in the short term.

Green Deal - Continue farm-to-fork in the EU!

In this tense and changing environment, a balance must be struck between reducing dependence on inputs and maintaining current production schedules. The Farm to Fork strategy has as its main objective the reduction of fertilizer use. Related to this, the EU must adopt a protein crop strategy



in the medium term that can, over time, reduce dependence on both imported feed and expensive and climate-damaging synthetic fertilizers. However, given the sudden and intense pressure on feed and fertilizer and the heavy dependence of the agri-food industry on these inputs, the question is what Europe can do in the short term and by 2023.

Even if Europe is not directly threatened by food shortages, the war immediately sharpens the need to rethink food sovereignty in a European and national way that is ecologically sustainable. This concerns the increased need for consistent resource protection, but also many other areas, in order to reduce strong concentrations in food processing and marketing and to close regional economic and agricultural business cycles.

European and national agricultural policy - in terms of regulatory law and subsidy policy - must be consistently geared to these goals. This affects a large number of parameters - from agricultural production to rural areas.

Examples include:

- **improved promotion of organic farming**
- **a strong protein crop strategy to increase domestic feed production and reduce dependence on mineral fertilizers,**
- **a cropping strategy that improves the performance of our soils through crop diversification and reduces pesticide use,**
- **a reduction in livestock numbers in regions with high livestock densities, combined with the reintroduction of land-based animal husbandry**
- **closing gaps in self-sufficiency (e.g. vegetables, fish)**
- **Promote food handicrafts and decentralized processing and marketing structures**
- **Reduce food waste along the entire value chain**
- **Reduce consumption and sealing of agricultural land**
- **Focus research efforts and knowledge transfer (consulting, training) on more sustainable agriculture and nutrition**

To be rejected are...

- Weakening of environmental and regulatory law and the obligation to comply (e.g. demand for suspension of the EU Nitrate Directive infringement proceedings).
- Cuts in the precautionary principle and risk prevention (e.g. in pesticide approval procedures, the import of imported products or in genetic engineering law)
- Further dilution of the ecological impact of the CAP reform adopted from 2023 onwards (such as withdrawals on specifications for ecological fallback areas)