

# Impact of the European Green Deal on the Polish farming



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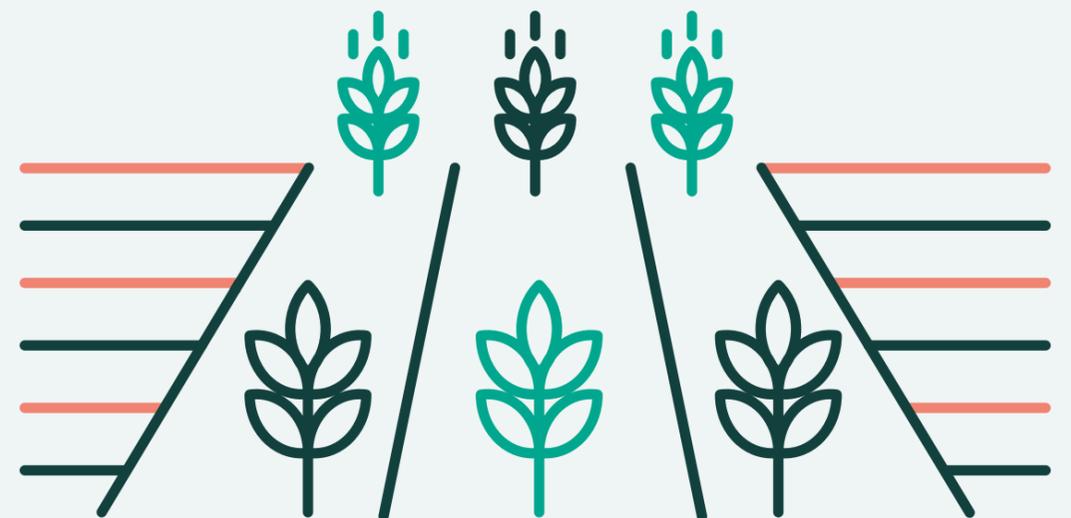
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# 01. Key findings

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## OBJECTIVE OF THE STUDY

The European Green Deal (EGD) is a plan to transform the European Union (EU) economy with the aim of minimising the scale of natural resource consumption, while maintaining international competitiveness. It also proposes measures that will have a significant impact on the agricultural sector in the EU. These include restrictions on the use of plant protection products, fertilisers and antimicrobial agents, as well as stimulating the development of ecological agriculture, changing the eating habits of Europeans, protecting and restoring ecosystems, and increasing the biodiversity of natural resources. Adapting agriculture to the EGD requirements, especially the Farm To Fork Strategy and the Biodiversity Strategy, which are crucial from the sector's perspective, is a cost-intensive task and entails a number of risks to the competitiveness of agricultural production, and consequently also to farmers' income and food availability in Poland. Hence, it is necessary to assess the scale and mechanisms of impact of the proposed regulatory changes, taking into account the propensities of Polish agriculture. This report is a contribution to the assessment of the impact of the EGD on agriculture in Poland, especially in terms of plant production.

## ASSUMPTIONS

The analysis was prepared by a consortium of experts from three research centres - the Institute of Rural and Agricultural Development of the Polish Academy of Sciences in Warsaw (IRWiR PAN), Institute of Soil Science and Plant Cultivation - State Research Institute in Puławy (IUNG-PIB) and Faculty of Economics of the Poznań University of Life Sciences (UPP). The basic research method was scenario analyses (simulations) presenting the impact of the implementation of the EGD on the area of cultivation of plant production in Poland, the yields and harvest levels, as well as on expenditures related to basic plant protection products and fertilisers, and consequently on the value of plant production, its cost-intensity and profitability. The results of simulations in the following three scenarios were compared:



*If EGD is fully implemented, farmers' incomes will fall by at least 11 per cent.*



### Scenario I (without EGD)

- **assumes no changes in the EU Common Agricultural Policy. This is the baseline scenario, serving as a reference point for the other two scenarios.** It is based on the extrapolation of trends in Polish agriculture observed in recent decades and on forecasts prepared before the publication of EGD, including internal analyses of IUNG-PIB. According to this scenario, the implementation of the current direction of agricultural development will lead to an increase in its intensity with a significant increase in sales of plant protection products and fertilisers. At the same time, the share of the area of ecological farming (hereinafter: ecological farming) and that using precision farming techniques (hereinafter: precision agriculture) will increase.



### Scenario II (partial implementation of EGD)

- **is based on the assumption that there will be a slight decrease in the sales of plant protection products and the use of mineral fertilisers.** In this scenario, organic farming will develop at the rate it did after Poland's accession to the European Union. Due to the need to reduce the use of fertilisers and plant protection products, the area of crops where precision agriculture techniques are applied will increase significantly. This scenario has been designed in such a way that, as compared to scenario I, partial implementation of EGD will not result in a significant decrease in production and in the gross margin generated in domestic plant production, i.e. the difference between farmers' income from plant production and the direct costs of this production, including expenditure on seed, fertilisers and plant protection products.



### Scenario III (full implementation of EGD)

- **is based on the assumption that all EU Member States will fulfill to the same extent all the objectives set out in the EGD,** i.e. a 50 per cent reduction in the use of plant protection products, an increase in the share of ecological farming to 25 per cent of all agricultural land, and a reduction in the use of mineral fertilisers by 20 per cent. This will result in a reduction in the use of plant protection products and mineral fertilisers, with a significant increase in areas devoted to ecological farming and precision agriculture. In the scenario of full implementation of EGD, among the crops analysed in the study, the organic crops of rye and oats will develop the most (the economic losses resulting from not using industrial means of production are small in this case), as well as fruit and vegetables, where farmers can count on an increase in the price of ecological products.
- **Moreover, it was assumed that the implementation of EGD, including the requirement to exclude agricultural land for non-productive purposes,** would not affect the area of crops of the analysed plant species. In each scenario, the total area of these crops will decrease by 6 per cent compared to the present situation, which will consist of a smaller area of cereals, especially triticale and winter wheat, and potatoes, with a simultaneous slight increase in rapeseed, orchards and berry plantations.

TABLE I.1.

		Current state	Forecast for 2030 (change from the current state)			
		Average for 2017-2019	Scenario I	Scenario II	Scenario III	
Sales of plant protection products (thousand tonnes)	<b>Total</b>	<b>68.6</b>	<b>24%</b>	<b>-5%</b>	<b>-50%</b>	
	of which	for conventional agriculture	68.4	24%	-6%	-51%
		for ecological farming	0.1	75%	268%	608%
Use of NPK mineral fertilisers (thousand tonnes)	<b>Total</b>	<b>2,012</b>	<b>-3%</b>	<b>-12%</b>	<b>-23%</b>	
	of which	Nitrogen	1,108	-1%	-16%	-27%
		Phosphorus	342	-4%	-9%	-17%
		Potassium	561	-5%	-8%	-17%
Agricultural area in GAEC (thousand ha)	<b>Total</b>	<b>14,526</b>	<b>-5%</b>	<b>-5%</b>	<b>-5%</b>	
	of which	precision farming	317	100%	300%	877%
		ecological farming	496	72%	259%	592%
Cultivation area of the analysed plant species (thousand ha)	<b>Total</b>	<b>8,354</b>	<b>-6%</b>	<b>-6%</b>	<b>-6%</b>	
	of which*	Winter wheat	1,973	-14%	-14%	-14%
		Potato	312	-10%	-10%	-10%
		Rapeseed	878	8%	8%	8%
		Triticale	1,318	-17%	-17%	-17%
		Apple	176	12%	12%	12%
	of which	conventional farming	95%	-5 p.p.	-15 p.p.	-41 p.p.
		precision farming	4%	4 p.p.	12 p.p.	35 p.p.
		ecological farming	1%	1 p.p.	3 p.p.	6 p.p.

\* ONLY THE FIVE CROPS WITH THE HIGHEST PRODUCTION VALUE ARE SHOWN IN THE TABLE. DATA FOR THE REMAINING CROPS CAN BE FOUND IN THE MAIN BODY OF THE REPORT.

## KEY CONCLUSIONS

TABLE I.2.

		Current state	Forecast for 2030 (change from the current state)			
		Average for 2017-2019	Scenario I	Scenario II	Scenario III	
Production efficiency of the analysed plant species (thousand PLN/ha)	Winter wheat	3.4	9%	3%	-6%	
	Potato	16.2	3%	-2%	-11%	
	Rapeseed	4.4	7%	2%	-7%	
	Triticale	2.3	5%	1%	-9%	
	Apple	15.8	-1%	-8%	-19%	
Farmers' income from analysed crop species production (billion PLN constant prices of 2020)	<b>Razem</b>	<b>32.2</b>	<b>2%</b>	<b>-3%</b>	<b>-13%</b>	
	of which*	Winter wheat	6.8	-6%	-11%	-19%
		Potato	5.1	-8%	-12%	-20%
		Rapeseed	3.9	16%	11%	1%
		Triticale	3.0	-12%	-16%	-24%
		Apple	2.8	11%	3%	-10%
Gross margin of analysed crop species production** (billion PLN constant prices 2020)	<b>Razem</b>	<b>20.7</b>	<b>-4%</b>	<b>-3%</b>	<b>-6%</b>	
	of which*	Winter wheat	4.0	-12%	-10%	-10%
		Potato	3.6	-11%	-14%	-21%
		Rapeseed	2.3	8%	13%	14%
		Triticale	2.1	-16%	-15%	-19%
		Apple	2.0	-4%	-1%	-1%

\* ONLY THE FIVE CROPS WITH THE HIGHEST PRODUCTION VALUE ARE SHOWN IN THE TABLE. DATA FOR THE REMAINING CROPS CAN BE FOUND IN THE MAIN BODY OF THE REPORT.

\*\* THE VALUE OF OUTPUT MINUS DIRECT PRODUCTION COSTS, EXCLUDING INDIRECT COSTS (E.G. ELECTRICITY, WAGES, MACHINERY RENTAL).

**As a result of the implementation of EGD, the efficiency of plant production in Polish agriculture will decrease.** In scenario III, the change in the volume of production per one hectare of crops will be between -22 per cent in the case of strawberries and no change for maize seed, while in the case of plant species with the largest share in agricultural production, the decrease will be at least 6 per cent. The reduction in agricultural productivity will result from the EGD-enforced reduction in the use of plant protection products and fertilisers, as well as from an increase in the area of ecological crops, which are characterised by lower production efficiency. These effects cannot be mitigated even by significantly increasing the use of precision farming techniques (e.g. field mapping combined with dosing

machine navigation), which can streamline the use of plant protection products and fertilisers through selective and precise dosing. The application of these techniques, makes it possible to maintain the same level of production while limiting the use of plant protection products but only by ca. 20 per cent. Thus, only the easing of requirements concerning the limitation of the use of plant protection products and mineral fertilisers to the level assumed in scenario II will make it possible to maintain agricultural productivity similar to the present one. This will apply to most species of plants analysed. Negative effects of EGD will be limited particularly in the case of those crops from which it is possible to implement precision agriculture relatively easily, i.e. mainly cereal crops. For fruits, practically any reduction in the use of plant protection products and fertilisers will lead to a decrease in production efficiency.

**Full implementation of EGD will reduce farmers' production and incomes.** Reduced production efficiency, together with a gradual decrease in the area under cultivation in scenario III, will reduce the total value of crop production by as much as 13 per cent, compared to only 3 per cent in scenario II. Among main crop species analysed in the scenario of full EGD implementation, rye production will decrease the most (by 28 per cent), followed by triticale (by 24 per cent), potatoes (by 20 per cent), and winter wheat (by 19 per cent). Production decrease will affect practically all crop species. This will translate into a decrease in direct surplus from crop production by 6 per cent. The drop in farmers' income is likely to be even higher and reach at least 11 per cent. The additional costs associated with the implementation of precision farming techniques (additional investment spending) will also contribute to this. However, this estimate does not take into account the very likely increase in other indirect costs such as electricity, gas, diesel and fuel oil, as well as salaries due to the increasing shortage of workers in agriculture. The full implementation of EGD would therefore be painful for farmers as it would hinder their economic development and reduce the attractiveness of agriculture as a form of economic activity. Only partial implementation of EGD, up to the level assumed in scenario II, may protect Polish farmers from falling incomes.

**The implementation of EGD will translate into higher food prices.** The scenario simulations described above were carried out assuming constant prices at the current level. However, most farmers will want to compensate for the fall in yields and the investment outlays incurred by raising the prices of their products. This will be aided by a decrease in the supply of agricultural raw materials in Poland and other EU countries, enforced by the EGD - in a situation of growing demand, buyers for more expensive cereals, vegetables and fruit will easily be found. This will be reflected in consumer food prices, which account for nearly 25 per cent of Poles' expenditures. The increase in cereal prices is likely to be the most



*EGD implementation will reduce food security in Poland - prices will rise and availability of food products will decrease.*

acute, translating into higher prices for bread and other flour products, and also - indirectly through an increase in the costs of animal feed - into higher prices of meat, eggs and dairy products. Hence, also other food prices, like fats, sugar and sweets, will increase. As it affects all sectors of the economy, the EGD will also affect energy and utilities costs incurred by food producers, causing food prices to increase even further. This will translate into higher inflation, especially for low-income earners, which are characterized by the highest share of food expenditures in their household's budgets.

**The international competitiveness of Polish agriculture will deteriorate.** This will be the result of a simultaneous increase in the relative prices of Polish agricultural commodities in comparison to their foreign equivalents, especially those from outside the EU, and a reduction in farmers' production capacity caused by a fall in plant production efficiency. The deterioration in competitiveness will most severely affect smaller farms (below 50 hectares) for which the implementation of precision farming techniques is unprofitable - these entities will be pushed out of the market or forced into unplanned and none-rational extensification of production. The weaker competitive position of Polish agriculture will contribute to the deterioration of the foreign trade balance in agri-food products - exports will decrease and imports will increase, especially from regions not covered by such rigorous environmental requirements that are present in Europe. This may lead to the offshoring of environmental damage outside the EU, i.e. pushing out input-intensive production, including production heavily dependent on fertilisers and plant protection products. While their use is strictly defined and controlled in the case of EU producers, equally strict and consistently enforced restrictions do not always apply to trading partners from outside of the EU.

A disruption of the structure of Polish foreign trade in agri-food products, which is currently environmentally justified, may be an indirect effect of introducing EGD. Exports and production of goods with lower demand for fertilisers and plant protection products (e.g. corn grain) will increase, while imports of goods that have so far been basic export commodities (apples, cereals) will grow. All these will contribute to a greater vulnerability of Polish agriculture to external supply shocks and will limit food security in Poland - access to food products will be limited and their prices will increase.



*If EGD is fully implemented, crop production in Poland will fall by 13 per cent.*

**It is uncertain whether all the environmental objectives of the EGD will be achieved.** Positive effects of EGD implementation include a reduction of leakages of biogenic compounds (e.g. nitrates and phosphates). This will be an effect of a fall in fertilisers consumption and a simultaneous increase of biodiversity, which will be fostered by: more precise use of less industrial means of production, increase in the share of organic farming, as well as the introduction of more plant species in crop rotation which will compensate for reduced mineral fertilisation (e.g. leguminous plants) and reduce nutrient losses (e.g. catch crops, undersowns). However, a top-down reduction in the use of mineral fertilisers and plant protection products is also associated with the risk of undesirable effects. On intensively used soils, reduced fertilisation will lead to nutrient depletion, increasing the negative impact of agriculture on the environment. This may also result in a slower improvement in the pH of agricultural soils in Poland. Due to natural causes and many years of liming negligence, more than half of soils have an unfavourable pH. Limiting fertilisation will not lead to a rapid improvement in this area. Paradoxically, a slower (than prescribed in the EGD) rate of reduction in the use of mineral fertilisers and plant protection products may contribute to more favourable environmental effects, as Polish farmers will have time to implement precision agriculture, switch to ecological farming and will be more motivated to rationalise the sowing structure. In Polish agriculture there is room to reduce the amount of used means of production per hectare, but only through their more rational use.

**Polish agriculture is not prepared to fully implement the EGD.** The productivity of farms in Poland is one of the lowest in the EU - a result of agrarian fragmentation, as well as lower soil quality and a shorter vegetation period than in Western European countries. As a result, in order to maintain agricultural productivity competitive at the EU level, higher consumption of mineral fertilisers and plant protection products is necessary. In such a situation, the need to reduce their use will result in a greater fall in production in Poland than in Western or Southern European countries. Moreover, due to the agrarian fragmentation, relatively low technical endowment and small financial resources of farms, it will be much more difficult to implement precision farming methods in Poland than in Western European countries. These methods are profitable mainly for farms with an area over 50 hectares, which means that they will be effectively implemented in only 3 per cent of farms managing less than 30 per cent of all agricultural land in the country. As a result, on small farms, the fall in productivity and farmers' income will be even deeper than the national average, which may lead to an economically and ecologically unjustified (e.g. leading to a decline in biodiversity) extensification of production or even threaten their financial foundations.



*Implementation of the EGD will worsen Poland's international competitiveness in food trade - exports will fall and imports will rise, especially from outside the EU.*

**Minimising the negative effects of EGD implementation will require financial and substantive support for agriculture.** In order to simultaneously maximise environmental benefits and minimise economic losses, it will be necessary to provide financial, technical and organisational support to farmers. Even the development of ecological farming depends much more on economic factors and organisational skills than on natural conditions. This will require adequate funding for individual farms. However, financial support for ecological farming must be strictly controlled and - in case of irregularities - corrected, so that excessively high and easily accessible support does not create incentives for larger farmers to convert to ecological production. Just to obtain subsidies, but without paying attention to the sale of crops on the ecological food market. Indeed, larger farms should implement precision farming techniques. This is an additional investment cost of PLN 150,000-300,000 per farm. Due to the limited financial possibilities of Polish agriculture, the funding will have to come at least in part from the state budget or EU funds.

Moreover, the Polish government should introduce advisory services covering economic, environmental and social aspects of running a farm, including the use of fertilisation plans or tools for effective use of plant protection products. A significant problem which will also have to be tackled by decision-makers implementing the EGD in Poland is the lack of data on the effectiveness of specific agricultural practices concerning more precise application of fertilisers or plant protection products. Without this information, it will be difficult to suggest appropriate protective measures that would enable to plan the pace and scale of EGD implementation in Poland in a way that would not cause a significant limitation of agricultural production, and, in consequence, a decrease in food security of the country as well as increase in social transformation costs in agricultural areas.



*Regardless of the scenario of the EGD implementation, the area of crops in Poland will fall by 6 per cent.*