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Preliminary estimate of the main agricultural and horticultural[1] crops in 2024

⇩ 4%

It is estimated that the harvest of basic cereals with cereal mixtures will be around 4% less than last year's and will amount to around 25.6 million tonnes

The results of the preliminary production estimate for the main agricultural and horticultural crops in 2024 are as follows:

- **production of basic cereals with cereal mixtures is provisionally estimated at 25.6 million tonnes, i.e. about 4% less than last year's harvest;**
- **rape and turnip rape production is estimated at about 3.4 million tons, i.e. about 9% less than last year's harvest;**
- **the production of field vegetables is estimated at approximately 3.8 million tonnes, which is 2% higher than in the previous year;**
- **it is estimated that the harvest of fruit from trees will be about 17% lower than last year and will amount approximately 3.6 million tonnes;**
- **fruit production from fruit bushes and berry plantations is estimated at 501 thousand tonnes, which is more than 11% less than the harvest in 2023.**

The unfavourable impact on the development of crop production in the current year was mainly due to:

- frosts recorded in the second half of April (in places below 9°C) causing damage to some agricultural crops, as well as blossoming of fruit trees and bushes and berry plantations;
- rainfall deficit in the second half of April and May, causing excessive soil dryness in some areas and limiting the production capacity of many crops, including cereals;
- locally occurring extreme climatic phenomena in June and July, i.e. thunderstorms, hailstorms and storms accompanied by strong winds.

Spring frosts combined with a rainfall deficiency in the second half of April and May had a negative impact on the production capacity of many crops, including cereals

On the other hand, the following had a favourable impact:

- the sowing of cereals and rape at optimal agrotechnical dates;
- good growth and bushiness of winter crops in autumn 2023;
- good overwintering of crops (only 0.1% of the sown area of winter cereals was ploughed).

Agrometeorological conditions

The course of agrometeorological conditions from autumn 2023 to summer 2024

The high air and soil temperatures that persisted until the end of the second decade of November supported vegetation and created good conditions for the emergence, growth and

[1] The information contains the results of a preliminary estimate of yields and harvests of cereals, rape and turnip rape, ground vegetables and fruit, as well as of the first swath of meadow grasses and an assessment of the condition of potato and sugar beet plantations, developed on the basis of expert opinions carried out in early July.
- expert opinions of Statistics Poland's (from the municipal level) developed on the basis of inspections of fields, meadows and orchards.

development of winter crops. It also enabled autumn field work and harvesting of root and fodder crops. Winter crops sown at optimum agrotechnical dates in November were tillering. The significant cooling and snowfall occurring in the third decade of the month contributed to the slowdown of plant life processes. In significant drops in air temperature near the ground level recorded mainly in the first half of December, sometimes reaching even - 15°C and below, despite the lack of snow cover or its low height, did not cause excessive cooling of the soil at the depth of the tillering node, but did inhibit the life processes of plants. In the second half of the month, as a result of warming (in places the air temperature rose up to 13°C), melting snow combined with rainfall resulted in ponding of water in the fields in some places. As a result of diurnal fluctuations in air temperature, there were repeated processes of freezing and thawing of the topsoil, which could cause weakening of the root system of plants.

The high air temperature persisting in early January caused disturbances in the winter dormancy of plants. The drops in air temperature recorded at the end of the first and second decade of the month (in places as low as minus 20°C and below) were short-lived and did not cause excessive cooling of the soil at the depth of the tillering node.

Exceptionally high air temperatures recorded in February, significantly exceeding the long-term norm, disturbed the winter dormancy of plants. In the second half of February, the start of the vegetation of winter plants and permanent grasslands was observed throughout the country. The rainfall that occurred during the month contributed to excessive moisture of the top layer of soil.

The weather in March was favorable for the growth and development of crops. The generally favorable agro-meteorological conditions recorded during the month enabled spring field work to be carried out. Locally, in the first decade (in evenly moist fields), and in a large area of the country in the second decade of the month, sowing of oats, spring wheat and spring barley began. Moistening the top layer of soil at the beginning of the growing season fully met the water needs of the plants.

Agrometeorological conditions in April varied. Warm days recorded in the first decade of the month were conducive to plant growth and development, as well as common field work. However, frosts in the second half of April (in places even below -9°C) caused damage to some agricultural crops, as well as flowering fruit trees and bushes and berry plantations. By the end of the month, the topsoil was observed to dry out in many areas of the country.

The warm and sunny weather at the beginning of May was conducive to widespread field work and plant growth and development. As a result of the cooling occurring in the second decade of May, the rate of plant growth and development slowed down. The marked shortage of precipitation during the month, significant in places, contributed to a decrease in soil water reserves. In many areas of the country there was a drying of the topsoil, and the water needs of plants were not fully met.

In June, agrometeorological conditions varied regionally and even locally. In many regions of the country, significant rainfall deficiencies were observed, causing soil drying. This had an adverse effect on the condition of many crops, mainly on weaker soils. At the same time, locally occurring heavy rains, combined with storms and strong winds, temporarily caused excessive soil moisture. In the second half of June, the harvest of winter barley began.

The July rainfall, also of a stormy nature, occurring throughout the country contributed to the improvement of soil moisture. However, this did not significantly improve the condition of cereal crops. In the first decade of July, rape and turnip rape were cut, followed by individual cereals. During the harvest, varied weather conditions are observed; their further course will affect the size and quality of the harvest. As a result of the varied humidity conditions occurring during the vegetation period, the greatest water shortages were recorded in the central-eastern part of the country: in the Mazowieckie and Lubelskie voivodeships and the southern part of the Podlaskie voivodeship. In the south of the country and in western and north-western Poland, the water deficit was the smallest.

Table 1. Air temperature and precipitation from autumn 2023 to spring 2024

Specification	National average air temperature		National average rainfall totals	
	°C	deviation from the norm [a]	mm	% norm [a]
AUTUMN [b] 2023				
September	17.7	3.9	22.4	39.0
October	10.9	2.1	75.5	162.0
November	4.2	0.1	70.4	177.0
WINTER [b] 2023/2024				
December	2.0	1.8	59.7	153.0
January	-0.3	0.9	50.8	139.0
February	5.7	5.8	65.2	206.0
SPRING [b] 2024				
March	6.7	3.6	28.4	75.1
April	10.5	1.9	37.8	104.0
May	16.0	2.6	33.9	53.3
SUMMER [b] 2024				
June	18.4	1.6	74.9	109.0

a) From 2021 IMiGW adopts as the average norm from years 1991-2020.
b) Monthly averages /Statistics Poland calculations based on IMiGW data/.

Cereals

It is provisionally estimated that the area under cultivation of basic cereals with cereal mixtures in 2024 is about 2% less than last year's and amounts to about 5.7 million ha[2], of which:

- wheat about 2.4 million ha;
- rye about 0.7 million ha;
- barley about 0.7 million ha;
- oats more than 0.5 million ha;
- triticale about 1.2 million ha;
- cereal mixtures about 0.3 million ha

[2] The sown area of agricultural and horticultural crops was determined on the basis of data from the Agency for Restructuring and Modernisation of Agriculture and estimates by field experts of Statistics Poland.

The yield of basic cereals with cereal mixtures is provisionally estimated at 44.8 dt/ha, i.e. 0.8 dt/ha (by 2%) less than last year's yield.

The yield of winter cereals including winter cereal mixtures is provisionally estimated at 47.5 dt/ha, i.e. 1.3 dt/ha (by 3%) less than last year's yield.

The yield of spring cereals including spring cereal mixtures was provisionally estimated at 35.2 dt/ha, i.e. 1.2 dt/ha (by 3%) more than last year's yield.

The harvest of basic cereals with cereal mixtures is estimated at 25.6 million tonnes, i.e. 0.9 million tonnes (by 4%) less than last year's crop.

The winter cereal harvest is provisionally estimated at 21.2 million tonnes, i.e. 1.1 million tonnes (5%) less than last year's harvest.

The spring cereals harvest, including spring mixtures, has been provisionally estimated at 4.4 million tonnes, i.e. 0.1 million tonnes (3%) more than last year's harvest.

The winter cereal harvest including winter cereal mixtures was provisionally estimated at 21.2 million tonnes, 5% less than last year

The harvest of spring cereals including spring cereal mixtures was provisionally estimated at 4.4 million tonnes, 3% more than last year

Table 2. Cereal yields and total rape and turnip rape from 2010-2024

Specification	2010	2015	2019	2020	2021	2022	2023	**2024** [a)]	2023 =100
	in decitons per 1 hectare								
basic cereals with cereal mixtures	35.1	36.7	35.2	44.8	42.6	45.9	45.6	**44.8**	98
winter wheat	45.7	47.6	46.4	54.2	51.8	54.4	54.8	**52.5**	96
spring wheat	34.3	33.5	32.6	41.7	39.6	42.4	40.4	**41.2**	102
rye	26.9	27.8	27.2	35.1	33.1	36.0	35.5	**36.5**	103
winter barley	40.7	41.3	43.0	51.1	47.7	49.6	50.7	**47.4**	93
spring barley	33.0	33.0	32.1	40.0	37.8	39.5	37.9	**38.8**	102
oats	26.4	26.5	24.9	33.2	31.4	32.8	30.8	**32.4**	105
winter triticale	35.2	36.3	35.9	45.0	43.1	45.5	45.4	**44.8**	99
spring triticale	28.4	28.4	27.5	36.4	33.7	35.6	33.1	**35.2**	106
winter cereal mixtures	30.9	30.9	30.6	38.1	36.6	37.5	37.3	**37.8**	101
spring cereal mixtures	30.5	27.2	26.2	34.5	33.7	33.8	31.5	**32.8**	104
rape and turnip rape	23.6	28.5	27.1	31.9	32.1	33.8	33.9	**33.0**	97

a) Preliminary yield estimate in 2024

Table 3. Cereal production and total rape and turnip rape from 2010-2024

Specification	2010	2015	2019	2020	2021	2022	2023	**2024** [a)]	2023 =100
	In million of tonnes								
basic cereals with cereal mixtures	25.1	24.7	25.1	28.6	27.0	26.9	26.5	**25.6**	96
winter wheat	8.5	9.9	9.5	12.0	11.3	12.6	12.5	**11.6**	93
spring wheat	0.9	1.1	1.5	0.6	0.9	0.9	0.7	**0.7**	105
rye	2.9	2.0	2.5	3.0	2.5	2.4	2.6	**2.5**	98
winter barley	1.0	1.0	1.0	1.4	1.4	1.5	1.8	**1.9**	108
spring barley	2.4	2.0	2.4	1.6	1.6	1.3	1.1	**1.1**	95
oats	1.5	1.2	1.2	1.7	1.7	1.5	1.5	**1.7**	111
winter triticale	4.2	4.7	4.1	5.9	5.2	5.3	5.2	**4.9**	95
spring triticale	0.4	0.6	0.5	0.3	0.2	0.2	0.2	**0.2**	104
winter cereal mixtures	0.3	0.3	0.2	0.4	0.4	0.2	0.2	**0.2**	96
spring cereal mixtures	3.0	1.9	2.3	1.7	1.9	1.0	0.7	**0.7**	96
rape and turnip rape	2.2	2.7	2.4	3.1	3.2	3.6	3.7	**3.4**	91

a) Preliminary production estimate in 2024

Rape and turnip rape

The rape and turnip rape harvest was provisionally estimated at 3.4 million tonnes, about 9% less than last year's

Winter rape sowing, which began in the second decade of August 2023, was completed in the second decade of September. The course of weather conditions in autumn was conducive to grain germination and emergence of winter rape plants. Before entering winter dormancy, plants on plantations, even those sown late, grew and branched out very well. This is due to the long and warm autumn. During the winter of 2023/2024, weather conditions did not cause major losses in winter rape sowing. In total, around 0.4% (in 2023 – around 0.1%) of the area sown in autumn was qualified for ploughing throughout the country, and the condition of winter rape plantations that were left for this year's harvest was assessed similarly to last year. Rapeseed flowering, which began in mid-April in some areas, took place in unfavourable weather conditions. April and May frosts, as well as the rainfall deficit recorded in the second half of April and in May, had an adverse effect on plants. Frost damage was observed on some plantations, mainly in the southwestern part of the country. The increase in air temperature and rainfall in the third decade of May and in June improved the condition of plantations. The condition of rape and turnip rape plantations in the final growing season is very diverse regionally and even locally.

It is estimated that the area under rape and turnip rape in the current year decreased compared to the previous year by about 6% and amounts to about 1.0 million hectares. The rape and turnip rape harvest was initially estimated at 3.4 million tons, about 9% less than last year.

Potatoes

Planting potatoes for early harvest began in some regions in March, while most plantations were planted in the second and third decade of April. Cool weather with frosts in April and May caused the plants to emerge slowly and unevenly. The lack of rainfall in May, as well as its uneven distribution, limited the yield potential of potatoes. Improved weather conditions from mid-May, and especially in June, caused potatoes on plantations to grow faster. The weather in July was conducive to the growth of potato plants and the accumulation of the crop. The frequent rainfall in many regions of the country, often in storms, caused excess moisture in the soil to be observed on some plantations. Frequent rainfall caused the appearance of potato blight in the fields as early as June - a dangerous disease of the species. However, the condition of plantations varies regionally.

It is estimated that this year the area of potato cultivation has increased compared to last year and amounts to approx. 0.2 million ha. Later varieties have not yet accumulated a yield and its amount will ultimately depend on weather conditions in the further vegetation period.

Sugar beets

It is initially estimated that the area of sugar beet cultivation will amount to about 0.3 million ha and will be larger than last year. Sugar beet sowing in the south-western part of the country began and ended in March due to favourable weather conditions, while in the rest of the country it was generally carried out in April. On plantations where sugar beet seeds were sown earlier, emergence appeared quickly and was generally even. The rainfall deficit in the first half of May slowed down the pace of plant growth and development. Weather conditions from the second half of May and in June were favourable for sugar beet growth. Plant density on most plantations is very good and amounts to about 95 thousand plants per hectare. In the first half of July, the condition of sugar beet plantations was good, and the dynamic vegetation promises high yields. However, the amount of sugar beet yields will depend on the further course of vegetation.

Meadow hay

The condition of permanent grasslands after winter was good. Spring vegetation of plants began on permanent grasslands in the second half of February and proceeded without disruptions. The harvest of the first cut of meadow hay began in some places in the first decade of May. The generally rainless weather in May allowed for the efficient performance of the first cut of meadow hay. In many regions of the country, haymaking was carried out early, which resulted in good quality of hay that dried quickly. It is estimated that the hay of the first cut was of good quality - harvested in favourable weather conditions, but also of high nutritional value - plants that were not outdated and harvested at the right growth stage.

The harvest from permanent meadows of the first cut (in hay terms) amounted to approximately 6.4 million tonnes, i.e. approximately 1% more than last year

The yield of the first cut of meadow grasses in terms of hay was estimated at around 27.9 dt/ha, while the harvest from permanent meadows (in terms of hay) amounted to around 6.4 million tonnes.

Field vegetables

The weather conditions at the beginning of the growing season in 2024 were not favorable for field vegetables. Excessive soil moisture at the beginning of the year resulted in delays in field works, especially in the north-eastern and south-eastern parts of Poland. Thanks to the persistently high soil moisture, the emergence of vegetables sown at the end of March and the beginning of April was even, but the lack of rainfall in many regions of the country, recorded in the second half of April, resulted in a slowdown in the growth and development of plants. As a result of frosts occurring at the end of April and early May, frost losses occurred, mainly in uncovered plantations. In the following weeks of May, the deterioration of the condition of vegetables (mainly in non-irrigated crops) was caused by the deepening rainfall

The production of field vegetables is currently estimated at approx. 3.8 million tonnes, i.e. 2% higher than in the previous year

deficit. At the end of May, hailstorms were reported in some parts of the country, causing damage to plants. The high air temperatures in June led to the drying of the soil, hindering the growth of plants, especially those planted into the ground from seedlings. Rainfall in July in most of the country contributed to improving the water balance, but on heavier soils, in warm and sunny weather, it led to the formation of a soil crust, which inhibited the penetration of rainwater into the ground. The weather conditions so far have favored the development of fungal diseases and plant pests, including molluscs. Favorable weather conditions in July accelerated the development of plants and the ripening of vegetables.

It is estimated that this year's cabbage harvest will amount to approx. 593 thousand tonnes, but the yield of late varieties will have a decisive influence on the final size. Cauliflower production is estimated at 111 thousand tonnes. The onion harvest this year, due to the increase in the area under cultivation, may exceed 695 thousand tonnes. Carrot production was estimated at 572 thousand tonnes, root parsley for approx. 150 thousand tonnes, and the beetroot harvest for approx. 249 thousand tonnes. The increase in the cultivation area contributed to the increase in tomato production to almost 210 thousand tonnes. The cucumber harvest this year was estimated at almost 118 thousand tonnes, root celery for approx. 101 thousand tonnes, and the sweet corn harvest will increase to 160 thousand tonnes. The total production of pumpkin, squash and zucchini is currently estimated at 423 thousand tonnes, while the harvest of other vegetable species will amount to approx. 519 thousand tonnes.

Fruits

The harvest of fruit from trees in orchards is currently estimated at approx. 3.6 million tonnes, i.e. approx. 17% less than the production in the previous year

This year's winter did not cause significant frost damage to fruit trees in orchards. Due to high air temperatures at the beginning of the year, fruit trees entered the growing season 2 to 3 weeks earlier than the multi-year average. As a result, fruit plants began flowering exceptionally early, which is why pollinator visits were less intense than in previous years. Favourable thermal conditions deteriorated significantly in the second decade of April. Due to the wave of frosts that hit many regions of the country at that time, frost damage to flower buds and already set fruit was noted on numerous plantations. Damage to fruit plants and fruit also occurred in the second half of May as a result of intensive hail, accompanied by strong and gusty winds. The course of weather conditions in the subsequent months of the growing season was characterized by significant diversification. Rainfall in the second half of May, in June and in July in many regions of the country favored the development of fungal diseases and fruit mold. At the same time, the lack of sufficient rainfall in some regions led to the smallness of the fruit and a decrease in the quality of the marketable crop. This year an increase in the pressure from plant pests and fungal diseases was observed, and due to the large diversification of weather phenomena across the country, there is a significant range in the size of the yield in fruit crops. Based on observations to date, a decrease in the harvest of most early fruit varieties is predicted, while the production volume of late varieties will depend on the further course of weather conditions.

This year's total harvest of fruit from trees is currently estimated at approx. 3.6 million tonnes, which is approx. 17% less compared to the previous year. Apple production has been estimated at approx. 3.2 million tonnes, which is 17% less than in 2023. The volume of pear harvest in orchards will be approx. 6% smaller than last year and will amount to 74.2 thousand tonnes. Due to unfavourable weather conditions, plum production may decrease by 17% to 106.2 thousand tonnes, sour cherry harvest will drop by almost 25% to approx. 127.0 thousand tonnes, and sweet cherries by approx. 24% to 52.1 thousand tonnes. The total harvest of peaches, apricots and walnuts is expected to be 27% lower than last year and amount to 14.4 thousand tonnes. The harvest from other fruit trees (including dogwood, rowan, common medlar and quince) will amount to approx. 2.3 thousand tonnes and will be approx. 20% lower than in 2023.

The harvest of fruit from fruit bushes in orchards and berry plantations was initially estimated at 501 thousand tonnes, which is 11% less than in the previous year

The production of fruit from fruit bushes in orchards and berry plantations was initially estimated at 501 thousand tons, i.e. about 11% less than in the previous year. The majority of fruit bush plantations in the country survived the winter in good condition, without significant frost losses. High air temperatures at the beginning of the growing season led to an acceleration of the physiological development of plants. Due to frosts in April, there was numerous damage to flowers and fruit buds. The intensity of pollinator flights was also low. The factor influencing the reduction in yields this year was the persistent rainfall deficit in many regions of the country. Favourable weather conditions in June and July did not significantly improve the condition of species in full fruiting, but were conducive to the development of fungal diseases. In 2024, the downward trend in the area of strawberry crops continued, and the production of these fruits decreased by approx. 12% and amounted to approx. 159.0 thousand tonnes. The reduction in area is primarily due to the decreasing demand for strawberries reported by processing plants. Additionally, this year, a deterioration in the quality of the harvested fruit was noted, and the supply period was significantly shortened. Due to low fruit purchase prices, in 2024, producers limited agrotechnical treatments on raspberry plantations, which resulted in a decrease in the condition of the plants. As a consequence, the harvest of this species will be approximately 14% lower than last year and will amount to approximately 83.0 thousand tonnes. Total currants production (black and coloured combined) is estimated at 108.9 thousand tonnes, i.e. approximately 16% less than in the previous year. The blackcurrant harvest will be 18% lower and will amount to approximately 75.0 thousand tonnes, with significant variation in the level of losses and yields being observed in the current growing season. Plantations entering full fruiting will contribute to an increase in blueberry production to 62.8 thousand tonnes (i.e. approximately 1% more than in 2023). The chokeberry harvest will decrease by over 12% compared to the previous year and will amount to 47.0 thousand tonnes, and gooseberry production will decrease by 13% to 7.2 thousand tonnes. The production volume of other fruits from fruit bushes and berry plantations in orchards was estimated at 33.0 thousand tonnes, i.e. 10% less than in 2023. The decrease in harvest was recorded especially in the case of haskap berries, which dominate in this group of fruits, as well as hazelnuts.

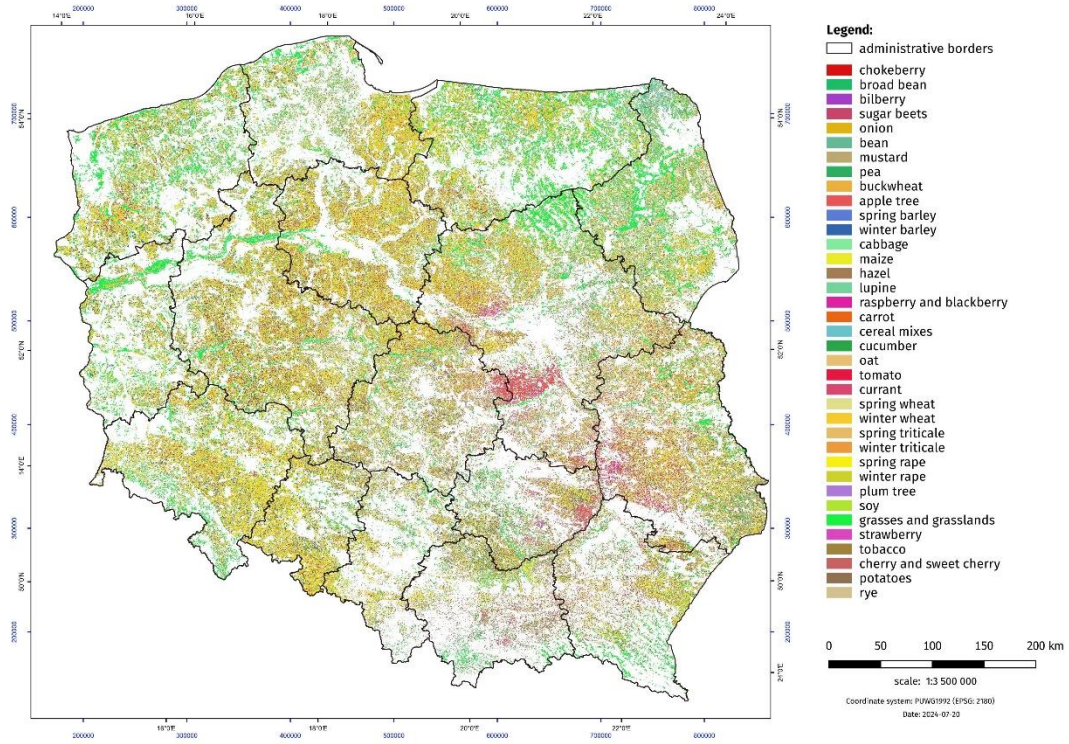
Forecasting the area of agricultural and horticultural crops using satellite remote sensing

In the field of work on the estimation of agricultural and horticultural crops, activities have been carried out for many years to use satellite imagery to forecast the area of agricultural and horticultural crops. The new system for obtaining data on agricultural crops, combined with the possibility of broader use of crop data from ARMA, constitutes the basis for a new methodology of agricultural research.

The resulting estimate of agricultural and horticultural crops was made using satellite remote sensing methods. The basis for its development were Sentinel-1A radar images with a resolution of 13.9x13.9m and Sentinel-2 with a resolution of 10x10m. Satellite data acquisition covered the period from October 15, 2023 to July 15, 2024. Due to the failure of one Sentinel-1 satellite, radar data was available every 12 days (previously ever 6 days). The range of recognized crops included 37 species. A total of 540 SLC (Single Look Complex) radar satellite scenes with a swath width of 250 km (4 TB of data) and Sentinel-2 optical data (306 satellite scenes, 0.5 TB of data) were used. The estimate was developed based on the segmentation and object classification of the T2 coherence matrix and the polarimetric decomposition parameters H/α using machine learning algorithms (Random Forest). Data from the vector database of payment applications obtained by the Agriculture and Environmental Department of the Statistics Poland from the Agency for Restructuring and Modernization of Agriculture were used to train the system and validate the classification results. In order to increase the precision of mapping the crop area, a mask of agricultural plots was used. The overall classification accuracy was achieved at the level of 63%. In 2024, the classification accuracy is lower than in the previous year. This is due to the fact that information about agricultural plots constituting only 55% of the entire collection was obtained for the analysis, while in

the previous year it was about 90%. The development of appropriately large samples for training the system also takes into account plots with small areas, which affects the final classification accuracy.

Map 1. Preliminary estimate of the main agricultural and horticultural crops



To develop estimates of agricultural and horticultural crops in Poland, medium-resolution satellite images from Sentinel satellites were used. Limitations resulting from spatial resolution cause difficulties in accurate identification of small plots (usually less than 10 ares), which negatively affects the quality of results. The problem concerns agricultural plots located mainly in the south-eastern part of Poland. More accurate crop estimates will be achieved by using a longer time series of images in a given vegetation period or by using images with higher spatial resolution for selected areas.

In case of quoting Statistics Poland data, please provide information: “Source of data: Statistics Poland”, and in case of publishing calculations made on data published by Statistics Poland, please include the following disclaimer: “Own study based on figures from Statistics Poland”

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Related information

Production of agricultural and horticultural crops in 2023

Data available in databases

BDL: Sown area

Terms used inn official statistics

BDL: Sown area