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Pre-result estimate of the main agricultural and horticultural[1] crops in 2023

⇩ 1 %

It is estimated that the harvest of total cereals will be around 1% less than last year's and will amount to around 35.2 million tonnes

The results of the preliminary production estimate for the main agricultural and horticultural crops in 2023 are as follows:

- **the harvest of total cereals will be around 1% less than last year's and will amount to around 35.2 million tonnes;**
- production of basic cereals with cereal mixtures is estimated at 26.1 million tonnes, i.e. about 3% less than last year's harvest;
- the harvest of rape and turnip rape is estimated at about 3.7 million tonnes, i.e. about 1% more than last year's harvest;
- potato harvest (including production in kitchen gardens) is estimated at around. 5.5 million tonnes, i.e. about 9% less than the harvest obtained last year;
- the sugar beet harvest is estimated at about 15.9 million tonnes, i.e. about 12% more than the harvest obtained in 2022;
- the production of field vegetables is estimated at over 3.8 million tonnes, i.e. approximately 3% less compared to the previous year;
- it is expected that the harvest of fruit from trees will amount to over 4.3 million tonnes, i.e. over 9% less than last year's production;
- the fruit harvest from fruit bushes and berry plantations is estimated at almost 0.6 million tonnes, i.e. about 3% less than the harvest in 2022.

Cereals

Cereal harvesting began in the third decade of July, and was commonly carried out in the first and second decade of August. The rainfall recorded in August made it impossible to carry out these works efficiently. In many regions of the country, excessive soil moisture was temporarily observed, causing difficulties and delays in the harvest of cereals and rape. August rainfall extended the time of grain harvesting, leading to an increase in grain moisture, the development of fungal diseases and a reduction in the protein level in the harvested grain. By the end of August, harvesting work was completed in almost the entire country.

The production of basic cereals with cereal mixtures is estimated at 26.1 million tonnes, i.e. about 3% less than that obtained in 2022

Based on the estimates, it is assessed that the total area of cereal cultivation in 2022 was about 7.1 million ha, including the area of sowing of basic cereals with cereal mixtures - about 5.7 million ha, of which:

- wheat more than 2.4 million ha;
- rye about 0.7 million ha;
- barley more than 0.6 million ha;

[1] The information contains the results of a pre-result estimation of yields and harvests of cereals, rape and turnip rape, potatoes, sugar beets, ground vegetables and fruit, as well as of the second swath of meadow grasses, developed on the basis of expert opinions of Statistics Poland's (from the municipal level) carried out in August on the basis of inspections of fields, meadows and orchards.

- oats about 0.5 million ha;
- triticale about 1.2 million ha;
- cereal mixtures about 0.3 million ha.

It is estimated that total cereal yields will amount to approximately 49.5 dt/ha, i.e. at the level of the previous year, and the yields of basic cereals with cereal mixtures will amount to 45.4 dt/ha, i.e. by 0.5 dt/ha (by 1%) less than the previous year's yield.

The yield of winter cereals, including winter cereal mixtures, was estimated at 48.6 dt/ha, i.e. 0.2 dt/ha (0.4%) less than the previous year's yield.

The yield of spring cereals, including spring cereal mixtures, was estimated at 33.8 dt/ha, i.e. 2.4 dt/ha (7%) less than last year's yield.

Table 1. Cereal yields and total rape and turnip rape from 2010-2023

Specification	2010	2015	2018	2019	2020	2021	2022	**2023** [a)]	2022 =100
	in decitons per 1 hectare								
basic cereals with cereal mixtures	35.1	36.7	32.3	35.2	44.8	42.6	45.9	**45.4**	99
winter wheat	45.7	47.6	43.0	46.4	54.2	51.8	54.4	**54.5**	100
spring wheat	34.3	33.5	31.5	32.6	41.7	39.6	42.4	**40.3**	95
rye	26.9	27.8	24.2	27.2	35.1	33.1	36.0	**35.0**	97
winter barley	40.7	41.3	37.8	43.0	51.1	47.7	49.6	**50.1**	101
spring barley	33.0	33.0	29.5	32.1	40.0	37.8	39.5	**37.7**	95
oats	26.4	26.5	23.5	24.9	33.2	31.4	32.8	**30.5**	93
winter triticale	35.2	36.3	32.8	35.9	45.0	43.1	45.5	**45.2**	99
spring triticale	28.4	28.4	25.1	27.5	36.4	33.7	35.6	**33.0**	93
winter cereal mixtures	30.9	30.9	28.2	30.6	38.1	36.6	37.5	**37.4**	100
spring cereal mixtures	30.5	27.2	25.0	26.2	34.5	33.7	33.8	**31.3**	93
rape and turnip rape	23.6	28.5	26.1	27.1	31.9	32.1	33.8	**33.8**	100

a) Pre-result yield estimate in 2023

The total cereal harvest is estimated at about 35.2 million tonnes, i.e. 0.4 million tonnes (1%) less than last year's harvest.

The harvest of basic cereals with cereal mixtures is estimated at 26.1 million tonnes, i.e. 0.9 million tonnes (3%) less compared to last year's harvest.

The winter cereal harvest was estimated at 21.9 million tonnes, i.e. 0.2 million tonnes (1%) less than previous year's harvest.

The spring cereals harvest, including spring mixtures, was estimated at 4.2 million tonnes, i.e. 0.7 million tonnes (14%) less than last year's harvest.

The winter cereal harvest including winter cereal mixtures was estimated at 21.9 million tonnes, 1% less than last year

The harvest of spring cereals including spring cereal mixtures was estimated at 4.2 million tonnes, 14% lower than last year

Table 2. Cereal production and total rape and turnip rape from 2010-2023

Specification	2010	2015	2018	2019	2020	2021	2022	**2023** [a)]	2022 =100
	In million of tonnes								
basic cereals with cereal mixtures	25.1	24.7	22.8	25.1	28.6	27.0	26.9	**26.1**	97
winter wheat	8.5	9.9	8.3	9.5	12.0	11.3	12.6	**12.3**	98
spring wheat	0.9	1.1	1.5	1.5	0.6	0.9	0.9	**0.7**	77
rye	2.9	2.0	2.2	2.5	3.0	2.5	2.4	**2.5**	104
winter barley	1.0	1.0	0.8	1.0	1.4	1.4	1.5	**1.7**	113
spring barley	2.4	2.0	2.3	2.4	1.6	1.6	1.3	**1.1**	85
oats	1.5	1.2	1.2	1.2	1.7	1.7	1.5	**1.5**	97
winter triticale	4.2	4.7	3.6	4.1	5.9	5.2	5.3	**5.1**	96
spring triticale	0.4	0.6	0.4	0.5	0.3	0.2	0.2	**0.2**	83
winter cereal mixtures	0.3	0.3	0.2	0.2	0.4	0.4	0.2	**0.2**	79
spring cereal mixtures	3.0	1.9	2.3	2.3	1.7	1.9	1.0	**0.8**	79
rape and turnip rape	2.2	2.7	2.2	2.4	3.1	3.2	3.6	**3.7**	101

a) Pre-result production estimate in 2023

Rape and turnip rape

The rape and turnip rape harvest was estimated at 3.7 million tonnes, about 1% more than last year's

Rape overwintered without major losses (only about 0.1% of the area sown with winter rape was plowed), and the condition of the winter rape plantation that was left for this year's harvest was assessed as better than last year. Rape vegetation in spring was generally undisturbed. Despite the late spring rainfall deficit, plant branching and pod filling were adequate. The rape harvest began locally in the second half of July and was generally completed in the second half of August. Unfavorable weather conditions during the harvest period with frequent and heavy rainfall made harvest work difficult. Rape seeds from this year's harvest are of good quality and have a high degree of oil content (above 40%).

It is estimated that the area under rape and turnip rape this year increased by about 1% compared to last year and amounted to about 1.1 million ha. The rape and turnip rape harvest was estimated about 3.7 million tons, i.e. about 1% more than last year.

Potatoes

The potato harvest is estimated at about 5.5 million tonnes, i.e. 9% less than last year's harvest

Vegetation conditions from planting to mid-September - were not very favorable for potato crops. The lack of rainfall in May, June and July, as well as their uneven distribution, meant that the yield potential of potatoes would not be fully utilized. However, the condition of plantations varies regionally and even locally. It is estimated that the quality of tubers from this year's harvest will be average.

The area under potato cultivation in 2023 is estimated at about 0.2 million ha. It is estimated that potato yields this year will amount to 294 dt/ha and will be about 4% lower than last year's. The potato harvest is estimated at about 5.5 million tons, i.e. 9% less than last year's harvest.

Sugar beets

It is estimated that the sugar beet area will be about 16% larger than last year's and will amount to about 0.3 million ha. The weather conditions in the period from spring to mid-September, despite cold weather and insufficient rainfall, were generally favorable for sugar beet vegetation. Intense rainfall in August improved soil moisture on beet plantations. Good soil moisture in the final phase of vegetation causes an increase in the mass of sugar beet roots, but also a decrease in polarization. The amount of sugar beet yields was estimated to be lower than last year's by about 3% - at the level of 620 dt/ha. The sugar beet harvest is estimated at about 15.9 million tonnes, i.e. about 12% more than in previous year.

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Meadow hay

The vegetation conditions of meadow vegetation after the first cut were generally adverse, although regionally varied. Too little rainfall in June and July and high air temperatures did not favor the intensive growth of meadow vegetation, hence the yields and harvest of the second cut of meadow hay were not high. Unfavorable weather during the harvesting period made it difficult to dry the hay and had an adverse effect on its feed value. The harvesting of the second cut of meadow hay began locally in the second decade of July, and due to rainfall, haymaking lasted until the end of August. The yield of the second cut of meadow grasses converted into hay was estimated at about 18.9 dt/ha, while the harvest from permanent meadows (converted into hay) from the second cut amounted to about 4.3 million tonnes.

The harvest from permanent meadows of the second cut (converted into hay) amounted to about 4.3 million tonnes, i.e. about 7% less than last year's harvest

Field vegetables

Weather conditions during the current growing season are highly variable. Due to low air temperatures and excessive soil moisture, the sowing of early varieties of vegetables was delayed. The warming observed in the following weeks favored the planting of seedlings and sowing of late varieties of vegetables. The deterioration of weather conditions in May made it necessary to cover the plantations, especially those in the early stages of development. More favorable weather in the second half of May contributed to an intensive increase in the marketable yield of plants, but due to drought and high air temperatures in June and early July, plant vegetation slowed down in many regions of the country. In the second half of July and August there was an increase in the amount of rainfall. However, their intensity and scope of occurrence varied greatly. As a consequence, in some regions of the country the water balance improved, but in areas where heavy rains and hailstorms occurred, plants were damaged and crops were lost. A serious problem during this year's plant vegetation is strong pressure from fungal diseases and plant pests, and the possibility of effective fighting these pathogens is sometimes limited. The weather conditions have been hitherto the least favorable for growing cabbage, cauliflower and broccoli. In carrot and parsley crops, root cracking is observed due to intense rainfall and a rapid increase in the biological mass of the plants. The quality of the onion crop may also be lower.

The production of field vegetables is currently estimated at over 3.8 million tons, i.e. at a level of approximately 3% lower compared to last year

The total production of field vegetables (early and late) is currently estimated at over 3.8 million tonnes, i.e. approximately 3% lower than last year. Due to the improvement of the water balance in the soil and relatively high air temperatures in September, a slight increase in the total production of late varieties of vegetables can be expected. This year's cabbage harvest is estimated at approx. 620 thousand tonnes, and cauliflowers slightly over 126 thousand tonnes. Onion production was estimated at almost 626 thousand tonnes, the carrot harvest will amount to almost 580 thousand tonnes, and beets approx. 252 thousand tonnes. The production of field tomatoes may exceed 170 thousand tonnes, and cucumbers amounted to approx. 132 thousand tonnes. The parsley harvest was estimated at approx. 150 thousand tonnes, celery slightly over 101 thousand tonnes and sweet corn for approx. 154 thousand tonnes. The total production of pumpkins, squashes and zucchini this year will not exceed 415 thousand tonnes, while the harvest of all other species of field vegetables is estimated at almost 509 thousand tonnes. However, the final harvest amount will depend on the amount of rainfall and the air temperature level in the last weeks of the production period.

Fruits

Fruit harvests from trees in orchards are currently estimated at over 4.3 million tons, i.e. over 9% less than the production from the previous year

The total harvest of fruit from trees, fruit bushes and strawberries in 2023 is estimated at 4.9 million tonnes, which is almost 9% lower than in 2022. Mild weather during the winter of 2022/23 allowed the plants to survive the dormancy period in good condition, without significant frost losses. Low temperatures in March and April contributed to the delay in vegetation, which at the same time helped protect flower buds against frost. Due to unfavorable weather conditions, the intensity of pollinator flights was lower than last year. However, damage to the flowers occurred in May, and the drought that persisted in the following weeks caused a significant fall of buds. On many species of fruit plants, the number of fruit set was also lower. Repeated periods of relatively low temperatures and intense rainfall led to the spread of fungal diseases and pests. In most of the country, weather conditions improved slightly at the turn of June and July, while the first half of August was characterized by large amounts of rainfall, as well as locally occurring storms and hail. Significant damage to plants and fruit was reported on some plantations. High air temperatures in the second part of August, as well as warm and sunny days in September, favored ripening fruits, including apples and pears.

The production of fruit from trees was provisionally estimated at over 4.3 million tons, which is over 9% less than in 2022. The harvest from apple orchards will amount to approximately 3.8 million tonnes and will be almost 10% lower compared to last year. The production of pears in orchards is currently estimated at approx. 81 thousand tonnes, i.e. at the level achieved in 2022. The plum harvest was estimated at almost 123 thousand tonnes, i.e. 8% less than in the previous year. Cherry production amounted to approx. 165 thousand tonnes, i.e. 10% less than the year before, while the cherry harvest was estimated at almost 71 thousand tonnes, i.e. about 7% less than in 2022. The total harvest of peaches, apricots and walnuts was estimated at almost 20 thousand tonnes, i.e. approx. 8% less than last year. The harvest of remaining tree fruit amounted to almost 3 thousand tonnes, i.e. 4% less compared to 2022.

The harvest of fruit from fruit bushes in orchards and berry plantations was estimated at almost 0.6 million tons, i.e. about 3% less than in the previous year

Fruit production from fruit bushes and berry plantations in orchards was initially estimated at less than 0.6 million tonnes, i.e. approximately 3% less than in the previous year. The raspberry harvest was estimated at almost 101 thousand tonnes, i.e. about 4% less than in 2022. The decline in raspberry production was influenced by unfavorable weather conditions for this species, as well as low production profitability caused by limited demand for these fruits reported by processing plants. The total harvest of currants (black and colored currants combined) was estimated at approx. 142 thousand tonnes, i.e. almost 3% less compared to 2022. The factor limiting fruiting, similarly to last year, was a strong fall of flowers and then buds caused by drought. The blackcurrant harvest was estimated at 100 thousand tonnes, i.e. approx. 2% less than last year. The production of highbush blueberries was estimated at over 66 thousand tonnes, i.e. 4% more than in 2022. Strawberry production this year amounted to almost 179 thousand tonnes and was approximately 3% lower than last year. The gooseberry harvest was estimated at slightly above 9 thousand tonnes, i.e. 8% lower than in 2022. The production of other fruit from fruit bushes and berry plantations in orchards was estimated at almost 86 thousand tonnes, i.e. approximately 4% less compared to the previous year. Chokeberry and haskap berries have the largest share in this group.

Agrometeorological conditions

The course of agrometeorological conditions from autumn 2022 to summer 2023.

In July, ripening of rape and turnip rape as well as winter and spring cereals was observed throughout the country. In the second decade of the month, mowing of individual winter barley plantations and rape and turnip rape were observed locally. Harvesting work was commonly carried out in the first and second decade of August. In many parts of the country, frequent rainfall caused difficulties and delays in the harvest of cereals and rapeseed. Temporarily excessive soil moisture was also observed locally. In the first half of August, the har-

vest of rape and turnip rape was generally completed, and by the end of the month, the harvest of winter and spring cereals was completed in almost the entire country. Post-harvest treatments were carried out in the fields, stubble cultivation and pre-sowing plowing were carried out, and stubble catch crops were sown. In some areas, excess moisture in the soil made this work difficult. In the third decade of August, potato digging began. During the month, another swath of meadow grasses and perennial legumes was harvested throughout the country. Locally, frequent rainfall made it difficult to dry and harvest hay, but had a positive effect on the regrowth of meadow vegetation.

Table 3. Air temperature and precipitation from autumn 2022 to summer 2023

Specification	National average air temperature		National average rainfall totals	
	°C	deviation from the norm [a]	mm	% norm [a]
AUTUMN [b] 2022				
September	12.4	-1.4	69.3	117.6
October	11.2	2.5	26.6	57.1
November	4.3	0.3	19.7	51.5
WINTER [b] 2022/2023				
December	0.5	0.4	45.3	123.9
January	2.9	4.1	51.7	146.2
February	1.5	1.7	40.7	129.0
SPRING [b] 2023				
March	4.6	1.5	38.9	103.1
April	7.7	-1.0	41.8	110.9
May	12.9	-0.6	40.2	57.4
SUMMER [b] 2023				
June	17.6	0.8	54.0	75.7
July	19.5	0.6	71.8	78.3
August	19.7	1.2	104.6	155.9

a) From 2021 IMiGW adopts as the average norm from years 1991-2020.

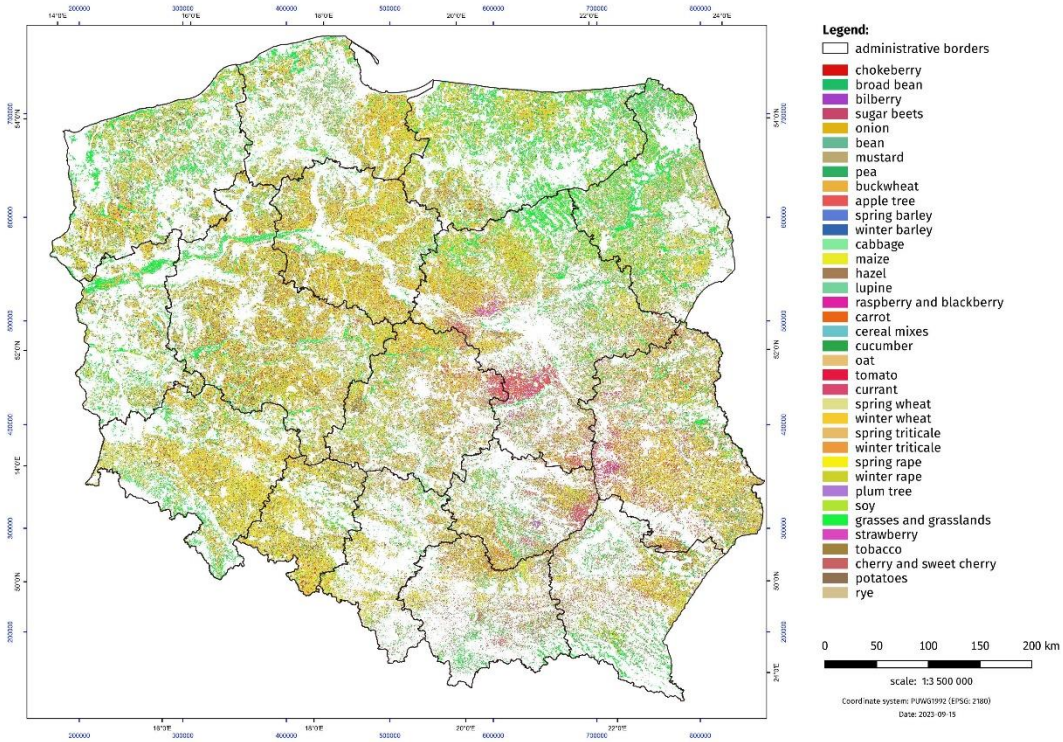
b) Monthly averages /Statistics Poland calculations based on IMiGW data/.

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

In terms of work on agricultural and horticultural crop estimates, efforts have been underway for many years to use satellite imagery to forecast agricultural and horticultural crop acreage. The new system for obtaining agricultural crop data, combined with the possibility of making greater use of crop data from ARMA, forms the basis of a new methodology for agricultural surveys.

The estimate of agricultural and horticultural crops was made using satellite remote sensing methods. It was based on Sentinel-1A radar images with a resolution of 13.9x13.9m and Sentinel-2 with a resolution of 10x10m. Satellite data recording covered the period from 15.10.2022 to 15.09.2023 (excluding winter months). Due to the failure of one Sentinel-1 satellite, radar data were available every 12 days. The range of crops identified included 37 species. A total of 540 satellite scenes (4.5 TB of data) of 250 km wide SLC (Single Look Complex) radar data and Sentinel-2 optical data (3225 satellite scenes, 3.5 TB of data) were used. The estimation was developed on the basis of segmentation and classification of the object-based T2 coherence matrix and H/α polarimetric de-composition parameters using machine learning algorithms (Random Forest). To teach the system and validate the classification results, data from a vector database of payment applications obtained by the Department of Agriculture and Environment of the Statistics Poland from the Agency for Restructuring and Modernisation of Agriculture were used. In order to increase the precision of crop area mapping, a mask of agricultural parcels was used. An overall classification accuracy of 74% was obtained.

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



The estimation of agricultural and horticultural crops for Poland was developed on the basis of satellite images with a resolution of more than 100 m². The current use of images from Sentinel-type satellites results in inaccurate identification of small plots (usually less than 10 acres) and adversely affects the quality of the results. The problem concerns a part of agricultural plots in south-eastern Poland. Estimates obtained from the satellite crop identification system using higher-resolution images for this area are the future of the system.

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

Land use and sown area in 2019
Production of agricultural and horticultural crops in 2022

Data available in databases

BDL: Sown area

Terms used inn official statistics

Crop area