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Result estimate of the main agricultural and horticultural¹ crops in 2023

 **0.5 %**

It is estimated that the harvest of total cereals will be around 0.5% larger than last year's and will amount to around 35.8 million tonnes

The results of a result estimation for the main agricultural and horticultural crops in 2023 are as follows:

- **the harvest of total cereals will be around 0.5% more than last year's and will amount to around 35.8 million tonnes,**
- production of basic cereals with cereal mixtures is estimated at 26.5 million tonnes, i.e. about 2% less than last year's harvest,
- the harvest of rape and turnip rape is estimated at about 3.7 million tonnes, i.e. about 3% more than last year's harvest,
- potato harvest (including production in kitchen gardens) is estimated at around 5.6 million tonnes, i.e. about 7% less than the harvest obtained last year,
- the sugar beet harvest is estimated at about 16.0 million tonnes, i.e. about 13% 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,
- the tree fruit harvest amounted to approx. 4.4 million tonnes, i.e. nearly 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 6% less than the harvest in 2022.

Cereals

The harvesting of cereals was commonly conducted in the first and second decades of August. August rainfall extended the duration of cereal harvesting, leading to an increase in grain moisture and a reduction in protein levels in the harvested grain. By the end of August, harvesting activities were completed in almost the entire country.

Based on the estimates, it is assessed that the total area of cereal cultivation in 2023 was about 7.2 million ha, including the area of sowing of basic cereals with cereal mixtures - about 5.8 million ha, of which:

- ✓ wheat more than 2.4 million ha,
- ✓ rye about 0.7 million ha,
- ✓ barley more than 0.6 million ha,
- ✓ oats about 0.5 million ha,
- ✓ triticale about 1.2 million ha,
- ✓ cereal mixtures about 0.3 million ha.

The production of basic cereals with cereal mixtures is estimated at 26.5 million tonnes, i.e. about 2% less than that obtained in 2022

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

The yield forecast for corn, winter wheat and winter rape and turnip rape was developed using satellite images from the Copernicus program and MODIS satellite images.

It is estimated that total cereal yields will amount to approximately 49.9 dt/ha, i.e. 0.4 dt/ha (by 1%) more than the previous year's yield, and the yields of basic cereals with cereal mixtures will amount to 45.6 dt/ha, i.e. by 0.3 dt/ha (by 1%) less than the previous year's yield.

The yield of winter cereals, including winter cereal mixtures, was estimated at 48.8 dt/ha, i.e. at the level of the previous year.

The yield of spring cereals, including spring cereal mixtures, was estimated at 34.0 dt/ha, i.e. 2.2 dt/ha (6%) less than last year's yield.

The total cereal harvest is estimated at about 35.8 million tonnes, i.e. 0.2 million tonnes (0.5%) more than last year's harvest.

The harvest of basic cereals with cereal mixtures is estimated at 26.5 million tonnes, i.e. 0.4 million tonnes (2%) less compared to last year's harvest.

The winter cereal harvest was estimated at 22.2 million tonnes, i.e. 0.2 million tonnes (1%) more than previous year's harvest.

The spring cereals harvest, including spring mixtures, was estimated at 4.2 million tonnes, i.e. 0.6 million tonnes (by 13%) less than last year's harvest.

The winter cereal harvest including winter cereal mixtures was estimated at 22.2 million tonnes, 1% more than last year

The spring cereal harvest including spring cereal mixtures was estimated at 4.2 million tonnes, 13% less than last year

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	45.6	99
winter wheat	45.7	47.6	43.0	46.4	54.2	51.8	54.4	54.8	101
spring wheat	34.3	33.5	31.5	32.6	41.7	39.6	42.4	40.4	95
rye	26.9	27.8	24.2	27.2	35.1	33.1	36.0	35.5	99
winter barley	40.7	41.3	37.8	43.0	51.1	47.7	49.6	50.7	102
spring barley	33.0	33.0	29.5	32.1	40.0	37.8	39.5	37.9	96
oats	26.4	26.5	23.5	24.9	33.2	31.4	32.8	30.8	94
winter triticale	35.2	36.3	32.8	35.9	45.0	43.1	45.5	45.4	100
spring triticale	28.4	28.4	25.1	27.5	36.4	33.7	35.6	33.3	94
winter cereal mixtures	30.9	30.9	28.2	30.6	38.1	36.6	37.5	37.3	100
spring cereal mixtures	30.5	27.2	25.0	26.2	34.5	33.7	33.8	31.5	93
rape and turnip rape	23.6	28.5	26.1	27.1	31.9	32.1	33.8	33.9	100

a) Result yield estimate in 2023

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	26.5	98
winter wheat	8.5	9.9	8.3	9.5	12.0	11.3	12.6	12.5	100
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	2.6	108
winter barley	1.0	1.0	0.8	1.0	1.4	1.4	1.5	1.8	117
spring barley	2.4	2.0	2.3	2.4	1.6	1.6	1.3	1.1	86
oats	1.5	1.2	1.2	1.2	1.7	1.7	1.5	1.5	100
winter triticale	4.2	4.7	3.6	4.1	5.9	5.2	5.3	5.2	98
spring triticale	0.4	0.6	0.4	0.5	0.3	0.2	0.2	0.2	85
winter cereal mixtures	0.3	0.3	0.2	0.2	0.4	0.4	0.2	0.2	75
spring cereal mixtures	3.0	1.9	2.3	2.3	1.7	1.9	1.0	0.7	78
rape and turnip rape	2.2	2.7	2.2	2.4	3.1	3.2	3.6	3.7	103

a) Result production estimate in 2023

Grain maize

This year's weather conditions generally did not favor the dynamic growth and development of corn plants. Low air temperatures in April and May resulted in delayed corn planting, and the emergence of plants was prolonged and uneven. The growth and development conditions of corn plants in subsequent months varied regionally. In many regions of the country (especially in the central-northern part), significant soil drought occurred, leading to incomplete cob kernelization and plant drying (especially on lighter soils). In areas of the country (mainly in the southern part) where rainfall was more regular, corn vegetation conditions were favorable. Plants achieved the proper mass and height, and cobs were well-filled with grain. Therefore, the plant yield will be regionally and even locally diverse. Corn harvesting for grain began in October and was commonly carried out in November. A small portion of the plantations remains unharvested. The yield of plants from plantations left for later harvesting will be lower, and the collected grain will be of lower quality.

It is estimated that the area of corn cultivation for grain increased by about 5% compared to the previous year, reaching approximately 1.3 million ha. The yield of corn for grain is estimated at 72.9 dt/ha and is expected to be higher than the previous year by about 1.8 dt/ha, or 3%. The harvest of corn grown for grain is estimated at approximately 9.2 million tonnes, about 8% more than last year.

It is estimated that the area of corn cultivated for silage is about 4% smaller than last year's, amounting to over 0.6 million ha. The harvest of corn for silage is estimated at approximately 28.5 million tonnes, about 6% less than in 2022.

The harvest of grain maize grown for grain estimated at approximately 9.2 million tonnes, about 8% more than last year's

Rape and turnip rape

The harvest of rape started locally in the second half of July and was commonly conducted in the first and second decades of August. Despite recorded rainfall during the harvesting period in the second half of August, the harvesting activities were completed. The rape seeds from this year's harvest are of good quality and show a high degree of oil content (above 40%).

It is estimated that the area under rape and turnip rape this year increased by about 2% compared to last year and amounted to about 1.1 million ha. The rape and turnip rape harvest was estimated about 3.7 million tonnes, i.e. about 3% more than last year.

Potatoes

Vegetation conditions, from planting to mid-September, were unfavorable for potato crops. Cool spring weather with a lack of rainfall inhibited the growth and development of plants. Insufficient rainfall in June and July, as well as their uneven distribution, resulted in the underutilization of the potato yield potential. 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 296 dt/ha and will be about 4% lower than last year's. The potato harvest is estimated at about 5.6 million tonnes, i.e. 7% less than last year's harvest.

Sugar beets

It is estimated that the sugar beet cultivation area will be larger than last year by approximately 18%, reaching about 0.3 million ha. The course of weather conditions from spring to mid-September, despite the spring coolness and insufficient rainfall, generally favored the growth of sugar beets. Intense rainfall in August led to an improvement in soil moisture levels in many regions of the country and increased the mass of beet roots on plantations, although at the expense of polarization. The sugar beet harvesting campaign, started in the first half of September, proceeded without disruptions according to the planned schedule. In most regions of sugar beet cultivation, harvesting was completed in the first half of November. It is estimated that by the end of November, a small portion of sugar beet plantations in various regions of the country remains unharvested. With the temperature drops and freezing of the topsoil recorded in the third decade of November, along with snowfall, temporary difficulties with sugar beet equipment in the fields have arisen.

The amount of sugar beet yields was estimated to be lower than last year's by about 4% - at the level of 613 dt/ha. The sugar beet harvest is estimated at about 16.0 million tonnes, i.e. about 13% more than in previous year.

Meadow hay

The vegetation conditions of meadow plants after the harvest of the second cut were generally favorable, although regionally highly diverse. Across the majority of the country, the August rainfall was sufficient for the regrowth of meadow vegetation in preparation for the third cut. The harvesting of the third cut of grass in meadows generally began in September. However, due to favorable weather conditions conducive to biomass accumulation, the subsequent hay cut from meadows was even carried out in October.

The yield of the third cut of meadow grasses converted into hay was estimated at about 11.7 dt/ha, while the harvest from permanent meadows (converted into hay) from the third cut amounted to about 2.6 million tonnes, i.e. about 7% less than last year's harvest.

The rape and turnip rape harvest was estimated at 3.7 million tonnes, about 3% more than last year's

The potato harvest is estimated at about 5.6 million tonnes, i.e. 7% less than last year's harvest

The sugar beet harvest is estimated at about 16.0 million tonnes, i.e. 13% more than last year

The harvest from permanent meadows of the third cut (converted into hay) amounted to about 2.6 million tonnes, i.e. about 7% less than last year's harvest

Field vegetables

Vegetation conditions for vegetable plants in 2023 were generally less favorable in comparison to the previous year. Vegetables were sown with some delay due to low air temperatures and excessive soil moisture. The warming observed in the following weeks favored planting seedlings and sowing late varieties of vegetables. A significant drop in air temperatures at the beginning of May was a strong stress factor for plants, especially on plantations where no covers were used. In the second half of May, weather conditions got better, enabling improvement in the condition of plants and an intensive increase in crops. This process slowed down in June and July, which was caused by high air temperatures and a persistent rainfall deficit. In the second half of July and August there was an increase in the number of precipitations, but both their intensity and scope varied. 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 some crops were lost. The crucial issue during this year's growing season was strong pressure from fungal diseases and numerous plant pests. Due to unfavorable weather conditions, the protection measures carried out were of limited effectiveness. Due to a significant increase in the prices of plant protection products, some producers limited their use. Relatively high air temperatures in September and October favored the weight gain of late varieties of vegetables, and harvesting conditions in the main production areas were good. Due to the significant variation in weather conditions during the season, the quality of the crops obtained is usually weaker than in previous years. Harvested vegetables weigh less, and due to physiological changes, their ability to be stored for a long time may be worse.

The total production of field vegetables (early and late) is estimated at over 3.8 million tonnes, i.e. less by 3% than in last year. The obtained production result was significantly influenced by favorable weather conditions in the last weeks of the growing season. The cabbage harvest this year amounted to approx. 632 thousand tonnes, i.e. 2% less than in 2022. Cauliflower production was estimated at over 128 thousand tonnes, i.e. 3% less than last year, and the quality of the collected heads was usually unsatisfactory. Onion production was estimated at approx. 636 thousand tonnes, i.e. about 2% less than in the previous year, the carrot harvest decreased by almost 7% to 578 thousand tonnes, while beets increased by approx. 7% to almost 259 thousand tonnes. The harvest of field tomatoes was estimated at 171 thousand tonnes, i.e. at a level similar to that achieved in 2022, and cucumber production decreased by 9% to almost 132 thousand tonnes. The parsley harvest amounted to 148 thousand tonnes, i.e. approx. 10% less than in the previous year, celery decreased by approx. 4% to 106 thousand tonnes, and sweet corn increased by approx. 16% to 154 thousand tonnes. The total production of pumpkins, squashes and zucchini amounted to 405 thousand tonnes and was over 7% lower than the year before, while the harvest of all other species of field vegetables is estimated slightly above 502 thousand tonnes.

Fruits from trees

The weather conditions during the winter of 2022/23 allowed fruit 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 freezing in early spring. However, the intensity of pollinator flight was lower than last year, which was caused by unfavorable weather conditions. The drop in air temperatures in May led to damage to the flowers, and the drought that continued in the following weeks caused a heavy fall of buds. As a result, the amount of fruit set on many plantations was lower than last year. Repeated periods of relatively low temperatures and long-term rainfall led to increased pressure from fungal diseases and pests. However, due to the high prices of plant protection products and the lack of appropriate weather conditions, the intensity and effectiveness of the treatments were limited. In most parts of the country, weather conditions improved at the turn of June and July, while the first half of August was characterized by large amounts of rainfall and locally occurring storms and hail. Significant damage to plants and fruit was reported in some plantations. High air temperatures in the

Production of field vegetable is estimated at over 3.8 million tonnes, by nearly 3% less than in last year

The harvest of fruit from trees in orchards is estimated at almost 4.4 million tonnes, i.e. about 9% less than the production from the previous year

second half of August, as well as warm and sunny days in September and October, favored the ripening of fruits, including: apples and pears and plums.

The production of fruit from trees in 2023 was estimated at almost 4.4 million tonnes, which is almost 9% less than in 2022. The harvest from apple orchards exceeded 3.8 million tonnes and was almost 9% lower compared to last year. The production of pears in orchards was estimated at 79 thousand tonnes, i.e. 2% less than last year, while the plum harvest decreased by approx. 5% and amounted to 126 thousand tonnes. Cherry production was estimated at 168 thousand tonnes, i.e. over 8% less than a year earlier, and the cherry harvest decreased by over 10% to 69 thousand tonnes. The total production of peaches, apricots and walnuts was estimated at almost 20 thousand tonnes, i.e. approximately 10% less than last year. The harvest of remaining tree fruit amounted to almost 3 thousand tonnes and were close to the result obtained in 2022.

Fruit from fruit bushes and berry plantations

Fruit production from fruit bushes and berry plantations in orchards was estimated at nearly 566 thousand tonnes, i.e. approx. 6% less than in the previous year. The decline in harvest was caused by difficult weather conditions during the growing season, but also by the limited use of fertilizers and plant protection on many plantations due to the increase in the cost of production inputs. The raspberry harvest in 2023 decreased by over 8% compared to the previous year and amounted to 96 thousand tonnes. The total production of currants (black and colored currants combined) was estimated at almost 130 thousand tonnes, i.e. 11% less than in 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 over 91 thousand tonnes, i.e. approx. 10% less than last year. The production of highbush blueberries amounted to almost 62 thousand tonnes, i.e. almost 4% less than in 2022. The strawberry harvest decreased by approx. 3% compared to the previous year to 180 thousand tonnes. Gooseberry production exceeded 8 thousand tonnes and was almost 15% smaller than the year before. The harvest of other fruit from fruit bushes and berry plantations in orchards was estimated at 90 thousand tonnes, i.e. at a similar level to last year. The largest share in this group is chokeberry and caramel berry.

The fruit harvest from fruit bushes in orchards and berry plantations was estimated at almost 566 thousand tonnes, i.e. approx. 6% less than in the previous year

Agrometeorological conditions and autumn assessment of winter crops in 2023

In September, exceptionally high air temperatures were recorded, significantly exceeding long-term averages, while simultaneously experiencing very low (considerably below average) precipitation. Due to the lack of rainfall in many areas of the country, soil drying was observed, making fieldwork, especially pre-sowing plowing and sowing of winter crops, challenging. The warm weather in September generally provided favorable conditions for crop harvesting. Early in September, the sowing of winter rape, pre-sowing plowing, and the sowing of rye and triticale, were completed. Locally, the sowing of winter wheat began in the second, and commonly in the third decade of the month. Soil moisture conditions were not conducive to the emergence of winter crops. In the first half of September, the harvest of another cut of meadow grasses and perennial legumes was generally completed, and the sugar beet harvest began. Throughout the month, potato digging, initiated in August, continued. Green maize harvesting was conducted nationwide. Locally, at the end of the month, cover crops were harvested. Warm and sunny weather in October, with locally intense rainfall, generally provided good conditions for fieldwork. By the end of the second decade of the month, the sowing of rye, triticale, and winter wheat, initiated in September, was completed. Winter crops sown in September began to tiller at the end of October. Similar to the previous year, the condition of winter crops' emergence was assessed at 3.8 to 3.9 qualifying degrees. In the second half of the month, potato digging was completed, and the harvest of sugar beets, grain maize, and cover crops continued. Pre-winter plowing was commonly carried out. Until the end of October, the pasture period continued across the entire country. In the

first half of November, higher than usual for this time of year, air and soil temperatures sustained vegetation and created favorable conditions for the emergence, growth, and development of late-sown winter crops. The weather also favored autumn fieldwork and the harvest of root and forage crops. Winter crops sown at optimal agronomic times were tillering, and the daily temperature fluctuations promoted the hardening of plants. Mid-November marked the end of the sugar beet and cover crop harvest nationwide. Winter plowing and other autumn fieldwork were also being completed. Throughout the month, the harvest of grain maize continued. Thermally favorable conditions in many regions of the country prolonged the pasture season until the third decade of November. Substantial cooling and snowfall in the third decade of November contributed to slowing down the life processes of plants.

Table 3. Air temperature and precipitation from spring 2023 to autumn 2023

Specification	National average air temperature		National average rainfall totals	
	°C	deviation from the norm ^{a)}	mm	% norm ^{a)}
SPRING ^{b)} 2023				
March	4.5	1.4	40.5	107.0
April	7.7	-0.9	39.8	109.0
May	12.8	-0.6	36.0	57.0
SUMMER ^{b)} 2023				
June	17.5	0.7	52.4	76.0
July	19.3	0.5	66.3	76.0
August	19.6	1.1	100.6	152.0
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

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

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

In the optimal agronomic timeframe, approximately 89% of the country's area designated for winter cereal crops was sown with winter crops, while the remaining area was sown even with a 1-2 week delay.

According to the November assessment conducted by Statistics Poland field experts, it is estimated that approximately 4.5 million ha of winter cereals were sown for harvest in 2024, which is similar to the previous year. This includes:

- ✓ Winter wheat on approximately 2.3 million ha,
- ✓ Winter rye on over 0.7 million ha,
- ✓ Winter triticale on approximately 1.1 million ha,

- ✓ Winter barley on over 0.3 million ha,
- ✓ Mixtures of winter cereals on about 0.1 million ha.

The area sown with winter rape and winter turnip rape is estimated to be around 1.0 million ha.

The sowing of winter cereals for the 2024 harvest, before entering the winter dormancy, was assessed in qualifying degrees as follows:

- ✓ Mixtures of winter cereals at 3.8 degrees,
- ✓ Winter rye at 3.9 degrees,
- ✓ Winter triticale at 4.0 degrees,
- ✓ Winter barley at 4.0 degrees,
- ✓ Winter wheat at 4.0 degrees.

The condition of the sown winter cereals, including wheat, rye, triticale, and barley, was assessed slightly higher than the previous year, while the sown mixtures of winter cereals were assessed at a level similar to the previous year.

Territorially, the state of winter cereal plantations varied significantly. Assessments of the condition of individual species of winter cereals ranged as follows:

- ✓ For winter wheat, from 3.4 qualifying degrees in the Dolnośląskie Voivodeship to 4.5 degrees in the Opolskie Voivodeship,
- ✓ For winter rye, from 3.5 qualifying degrees in the Dolnośląskie Voivodeship to 4.5 degrees in the Podkarpackie Voivodeship,
- ✓ For winter barley, from 3.5 qualifying degrees in the Dolnośląskie and Mazowieckie Voivodeships to 4.5 degrees in the Kujawsko-Pomorskie and Podkarpackie Voivodeships,
- ✓ For winter triticale, from 3.5 qualifying degrees in the Dolnośląskie Voivodeship to 4.4 degrees in the Kujawsko-Pomorskie, Opolskie, Podkarpackie and Śląskie Voivodeships,
- ✓ For mixtures of winter cereals, from 3.6 qualifying degrees in the Dolnośląskie, Mazowieckie and Pomorskie Voivodeships to 4.4 degrees in the Opolskie Voivodeship.

The average assessment for winter rape and turnip rape plantations nationwide was 4.0 qualifying degrees. Assessments for these plantations ranged from 3.6 qualifying degrees in the Mazowieckie Voivodeship to 4.7 degrees in the Podkarpackie Voivodeship.

In optimal agronomic timing, 85% of the area designated for winter wheat, nearly 93% of the area designated for winter rye, over 92% of the area designated for winter barley, nearly 93% of the area designated for winter triticale, about 90% of the area designated for winter cereal mixtures, and over 82% of the area designated for winter rape and turnip rape were sown.

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