

## CURRENT TRENDS IN CEREALS PRODUCTION AND MARKETING FOR THE NORTH-WEST REGION OF ROMANIA

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### Abstract

*The paper presents the main trends manifested in the production and marketing of cereals in the North-West Region of Romania, in the period 2014-2019. The paper analyzed the main indicators that point to the evolution of the cereal sector in this region. The indicators presented in the paper varied from one year to another. The largest area cultivated with grain cereals in the North-West Region of Romania was 522,405 hectares, registered in 2016, representing 9.52% of the area cultivated with cereals at national level. The largest areas in the analyzed region were cultivated with corn in 2016, namely 279,496 hectares. Also, it was found that the highest production was also obtained for corn, in 2018, of 1,953,648 tons. This was due on the one hand to the large cultivated areas and, on the other hand, to the high yields per hectare achieved for the maize crop. The statistical data that formed the basis of this paper were provided by the National Institute of Statistics.*

**Key words:** average production per hectare of cereal grains; cereals; commercialization; North-West Region; price

### INTRODUCTION

The North-West Region of Romania is included in Macroregion 1 and was created based on Law 151/1998. This region has in its composition the following counties: Bihor; Bistrita-Nasaud; Cluj; Maramures Satu Mare and Sălaj. The North-West region has an area of 34,160 km<sup>2</sup>, which represents 14.3% of the total territory of Romania, occupying the 4th place nationally (<https://www.nord-vest.ro/wp-content/uploads/2020/02/0.-Profil-socio-economic-Regiunea-Nord-Vest-draft-1.pdf>).

In the North-West Region, according to official statistics, agriculture has played a significant role for the regional economy. Thus, in 2016, the share of the agricultural sector in gross value added was 4.58%. This share registered in the North-West region was higher than the European average registered in 2017, which was only 1.6% (<https://www.nord-vest.ro/wp-content/uploads/2020/06/SWOT-Draft-PDR-2021-2027.pdf>).

In 2014, the value of agricultural production in the North-West region was 10,950,382 thousand lei, representing 12.6% of the value of vegetable production in Romania, in 2019, it was 7,304,362 thousand lei, representing 11.6% of the value of the vegetable product made in Romania. In this region, cereal crops occupy over 50% of the total cultivated areas. Cereals present a particular importance for both human and animal nutrition (*Pânzaru R.L., Medelete D.M., 2017*), (*Popescu A., 2018*). It is important to remember that cereals have a multitude of very important characteristics both in terms of food and economy (*Soare E., Chiurciu I.A., 2016*), (*Soare E., Dobre I., 2016*). Of these, the most representative are:

- low humidity content, which contributes to ensuring preservability for long periods of time;
- the nutritional value of cereals does not change over time;
- cereals represent a valuable raw material for a series of food products that can be consumed daily by people, without affecting the proper functioning of the human body;
- cereals are an important raw material for several industries;
- cereals are well suited for irrigation;
- cereals can be grown in an ecological system without great difficulties;
- ratio between proteins and carbohydrates of 1: 6, very beneficial to the human body;
- the cultivation technology for grain cereals is completely mechanized, etc (*Ion V., 2010*).

## **MATERIAL AND METHOD**

The paper analyzed the specific indicators of the cereal sector in the North-West Region of Romania, for the period 2014-2019. Here, the following indicators were analyzed: the area cultivated with grain cereals at both regional and county level; the area cultivated with the main cereals within the North-West Region; grain production at regional and county level; production for the main categories of cereals at regional level; average production per hectare for grain cereals at national and county level; yield per hectare for the main categories of cereals and average purchase prices for the main categories of cereals registered in the North-West Region. In the present paper, quantitative secondary statistical data were analyzed, taken from the National Institute of Statistics from the Tempo online database. The research results are presented in tabular form, in order to highlight as clearly as possible, the evolution of the analyzed indicators. In order to carry out this paper, a series of specialized materials were also consulted, which are specified both in the paper and in the "Bibliography" section.

## RESULTS AND DISCUSSION

**Area cultivated with grain cereals.** The area cultivated with grain cereals in the North-West Region of Romania fluctuated from one year to another, during the analyzed period (see Table no.1). This situation has also been registered at national level. It is necessary to remember that, in the North-West Region, grain cereals are cultivated mainly (over 50% of the total cultivated area). From the statistical data presented and analyzed it was observed that the smallest area with grain cereals was cultivated in 2014 (476,597 ha). In 2014, the area cultivated with grain cereals in the North-West Region represented 8.75% of the total area cultivated with grain cereals in Romania. At the opposite pole, the largest area cultivated with grain cereals was registered in 2016 (522,405 ha). The area cultivated with grain cereals from the North-West Region represented 9.5% of the total area cultivated with grain cereals at national level. In 2019, in the North-West Region, the area cultivated with grain cereals increased by 5.9%, compared to 2014. This increase was due to several factors, among which we mention: the increase of farmers' interest in this culture; state subsidies for cereals; increase in demand for grain on the regional market due to the intensification of the livestock sector, which contributes significantly to the regional economy, etc.

*Table 1*

Dynamics of the surface cultivated with cereals for grains in the North-West region, in the period 2014-2019 (hectares)

| Specification                 | 2014    | 2015    | 2016    | 2017    | 2018    | 2019    | 2019/<br>2014<br>(%) |
|-------------------------------|---------|---------|---------|---------|---------|---------|----------------------|
| <b>NORTH-<br/>WEST Region</b> | 476,597 | 516,364 | 522,405 | 492,397 | 504,764 | 504,988 | 105.9                |
| <b>Bihor</b>                  | 174,927 | 214,375 | 211,868 | 201,581 | 202,265 | 204,101 | 116.6                |
| <b>Bistrita-<br/>Nasaud</b>   | 32,162  | 33,912  | 34,078  | 30,339  | 30,090  | 30,102  | 93.5                 |
| <b>Cluj</b>                   | 70,732  | 68,022  | 72,786  | 66,869  | 71,787  | 72,875  | 103.0                |
| <b>Maramures</b>              | 26,957  | 27,663  | 28,783  | 26,062  | 28,857  | 27,977  | 103.7                |
| <b>Satu Mare</b>              | 135,600 | 134,138 | 135,535 | 129,807 | 134,003 | 131,883 | 97.2                 |
| <b>Salaj</b>                  | 36,219  | 38,254  | 39,355  | 37,739  | 37,763  | 38,049  | 105.0                |

Source: Own processing based on NIS, Tempo- Online Database, 2020

Within the counties in the North-West Region, it was observed that the area cultivated with grain cereals changed during the period analyzed differently. The most significant areas are found in Bihor and Satu Mare counties. From the presented statistical data, it is found that, in Bihor county, in 2015, the largest area with cultivated grains was registered, of 214,375 ha. Also here, in 2019, there was the highest percentage increase (+ 16.6%) of the area cultivated with grain cereals, compared to 2014. Satu Mare County ranks 2nd in the top counties in the North-West Region, depending on the

area cultivated with grain cereals. The largest area cultivated with cereals was registered in 2014 (135,600 ha). In 2019, in this county, there is a slight decrease (-2.8%) of the area cultivated with cereals, compared to 2014. Cluj County ranks 3rd in the top grain cereal cultivator counties in the North-West Region. Here, in 2019, the surface cultivated with grain cereals increased by 3.0%, compared to 2014. In Salaj County, the largest cultivated area was 39,355 ha (2016). In Bistrita-Nasaud County, in 2019, the area cultivated with cereals decreased by 6.5%, compared to 2014. In Maramures county, from the presented data, the smallest areas with grain cereals were cultivated. However, in 2019, in this county the area cultivated with grain cereals increased by 3.7%, compared to 2014.

In table no. 2 it is shown the evolution of the cultivated area with the main categories of cereals in the North-West Region of Romania, in the period 2014-2019. From the presented statistical data, it is observed that the corn culture is very well represented in the areas cultivated with cereals. This crop occupies the first position in the ranking of cereal crops, with the largest cultivated area in 2016 (279,496 ha). The smallest cultivated area with cereals was 254,391 ha (2017). In 2019, there was a slight decrease in the cultivated area by 0.3%, compared to 2014. The second place in the ranking of areas cultivated with cereals is occupied by wheat culture. In the North-West region in 2019, the area cultivated with cereals represented only 55.5% of the area cultivated with corn. The area cultivated with wheat registered variations from one year to another. The most significant area related to wheat cultivation was in 2019 (146,911 ha), and the smallest area was 122,922 ha (2014). In 2019, the area cultivated with wheat registered an increase of 19.5%, compared to 2014. This percentage increase for wheat cultivation is the largest increase among the main cereal crops in the North-West Region.

*Table 2*

Dynamics of the surface cultivated with the main cereals in the North-West region, in the period 2014-2019 (hectares)

| Specification      | 2014    | 2015    | 2016    | 2017    | 2018    | 2019    | 2019/<br>2014<br>(%) |
|--------------------|---------|---------|---------|---------|---------|---------|----------------------|
| <b>Wheat-total</b> | 122,922 | 146,614 | 144,662 | 142,875 | 144,426 | 146,911 | 119.5                |
| <b>Corn grains</b> | 265,360 | 276,771 | 279,496 | 254,391 | 263,858 | 264,569 | 99.7                 |
| <b>Oat</b>         | 35,159  | 35,516  | 35,793  | 33,951  | 34,667  | 34,101  | 96.9                 |
| <b>Barley</b>      | 11,620  | 14,260  | 15,514  | 14,330  | 15,038  | 13,991  | 120.4                |
| <b>Sorghum</b>     | 1,294   | 805     | 792     | 11,99   | 1,338   | 1,109   | 85.7                 |
| <b>Rye</b>         | 802     | 1,142   | 1,003   | 629     | 692     | 690     | 86.0                 |

Source: Own processing based on NIS, Tempo-Online Database, 2020

The most significant area cultivated with oat was 35,793 ha (2016), and the smallest was registered in 2017 (33,951 ha). In 2019, there is a decrease of 5.1% of the area cultivated with oat, compared to 2014. In order

to form an image about the appearance of this crop in the general picture of cereal crops, it is necessary to remember that, in 2019, the area cultivated with oat represented 12.8% of the area cultivated with corn. The area cultivated with barley registered a minimum in 2014 (11,620 ha) and a maximum in 2016 (15,514 ha). The surface cultivated with sorghum in the North-West Region decreased by 14.3%, in 2019 compared to 2014. Rye culture owned the smallest areas of land in the Northwest Region. The smallest cultivated area with rye was only 629 ha (2017). The surface cultivated with rye in 2019, represented only 0.2% of the area cultivated with corn in the North-West Region.

In the period 2014-2019, cereal growers had at their disposal several forms of support from the state, which contributed to the encouragement of this sector of activity. It is necessary to mention the forms of support for the cereal sector: direct payment schemes; State Aid for diesel used in agriculture and Transitional National Aid 1 (ANT 1) (<https://www.madr.ro/en/field-crops/cereals/wheat.html>).

**Production of grain cereals.** Table 3 shows the production dynamics for grain cereals in the North-West Region of Romania, in the period 2014-2019. Regarding the production of grain cereals, it can be seen that it fluctuated from one year to another in the analyzed interval. The production of grain cereals from the North-West Region registered a maximum in 2018 (2,895,230 tons) and a minimum in 2015 (1,702,708 tons). In 2019, the production of grain cereals represented 8.7% of the production registered at national level. The production of grain cereals from the North-West Region registered in 2019, an increase of 35.6%, compared to 2016. This increase in the production of grain cereals in the mentioned region is due on the one hand to the increase in yield per hectare and, on the other hand, to the increase of the areas destined for cereal crops.

Table 3

Dynamics of grain cereals production in the North-West region, in the period 2014-2019 (tons)

| Specification                | 2014      | 2015      | 2016      | 2017      | 2018      | 2019      | 2019/<br>2014<br>(%) |
|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------------------|
| <b>NORTH-WEST<br/>Region</b> | 1,955,323 | 1,702,708 | 1,977,559 | 2,431,034 | 2,895,230 | 2,652,989 | 135.6                |
| <b>Bihor</b>                 | 683,228   | 719,885   | 758,467   | 990,140   | 1,120,102 | 1,138,916 | 166.7                |
| <b>Bistrita-Nasaud</b>       | 101,732   | 81,404    | 96,694    | 115,940   | 136,838   | 124,845   | 122.7                |
| <b>Cluj</b>                  | 308,380   | 221,470   | 297,439   | 298,191   | 441,057   | 361,896   | 117.3                |
| <b>Maramures</b>             | 95,181    | 75,218    | 94,542    | 133,082   | 150,310   | 118,145   | 124.1                |
| <b>Satu Mare</b>             | 640,532   | 494,534   | 599,305   | 720,565   | 856,120   | 742,818   | 115.9                |
| <b>Salaj</b>                 | 126,270   | 110,197   | 131,112   | 173,116   | 190,803   | 166,369   | 131.7                |

Source: Own processing based on NIS, Tempo- Online Database, 2020

Regarding the production of grain cereals made in the counties of the North-West Region, it was found a change from one year to another in the period under analysis. As expected, in Bihor county were registered the most significant productions for the category "Cereal grains". The largest cereal production in Bihor County was achieved in 2019 (1,138,916 tons). The production of grain cereals in Bihor county registered an increase of 66.7%, in 2019, compared to 2014. Bihor County, in 2019, achieved 3.7% of the grain production achieved at national level. Satu Mare County is on the second place in terms of grain production. The highest cereal production was 742,818 tons (2019). In this county, in 2019, the production of grain cereals increased by 15.9%, compared to 2014. Cluj County ranks 3rd in the ranking of counties in the North-West Region, in terms of cereal grains production. The highest production was 441,057 tons (2018). In 2019, in Cluj County we witnessed an increase in cereal grains production by 17.3%, compared to 2014. Productions under 200,000 tons were obtained in the counties: Salaj Bistrita-Nasaud and Maramures. From the data presented and analyzed regarding the production of grain cereals in the counties from the North-West Region, a common element emerges, namely, that in 2019 there were increases in all counties, compared to 2014. This has had a positive impact on the economy of the North-West Region.

In table no. 4 it is shown the evolution of the production for the main categories of cereals in the North-West Region of Romania, in the period 2014-2019. From the presented data it was found that the cereal productions evolved differently from one year to another. An important contribution to this situation was represented by: the level of yields per hectare; climatic conditions; areas cultivated with different cereal crops, etc. The highest production was achieved for corn crops, of 1,953,648 tons (2018). The production of corn grains obtained in the North-West Region increased by 44.3%, in 2019, compared to 2014. Wheat production in the analyzed region was between 472,422 tons- 618,173 tons. Wheat production increased by 25.6% in 2019, compared to 2014. Oat production increased by 6.1% in 2019, compared to 2014, and the highest production in absolute value was 86,118 tons (2018). Barley production registered a maximum in 2018 (67,802 tons). Sorghum production and rye production are poorly expected in cereal production. In 2019, sorghum production decreased by 3.8%, compared to 2014. Rye production registered a maximum in 2015 (2,662 tons). In 2019, rye production increased by 15.2% compared to 2014.

Table 4

Dynamics for the main grain cereals production in the North-West Region, in the period 2014-2019 (tons)

| Specification      | 2014      | 2015    | 2016      | 2017      | 2018      | 2019      | 2019/2014 (%) |
|--------------------|-----------|---------|-----------|-----------|-----------|-----------|---------------|
| <b>Wheat-total</b> | 472,422   | 570,476 | 488,888   | 607,996   | 618,173   | 593,588   | 125.6         |
| <b>Corn grains</b> | 1,226,272 | 873,385 | 1,191,614 | 1,503,998 | 1,953,648 | 1,769,558 | 144.3         |
| <b>Oat</b>         | 70,814    | 69,997  | 83,007    | 86,118    | 83,771    | 75,146    | 106.1         |
| <b>Barley</b>      | 41,665    | 48,483  | 61,316    | 65,631    | 67,802    | 58,229    | 139.7         |
| <b>Sorghum</b>     | 3,946     | 2,257   | 2,230     | 3,743     | 5,428     | 3,799     | 96.2          |
| <b>Rye</b>         | 1,914     | 2,662   | 2,311     | 1,696     | 1,834     | 2,205     | 115.2         |

Source: Own processing based on NIS, Tempo-Online Database, 2020

**Average production per hectare of cereal grains.** The average production per hectare of grain cereals for the period 2014-2019, in the North-West Region is shown in table no. 5. The highest average production per hectare for grain cereals was recorded in 2018 (5,736 kg/ha). This average production per hectare realized in the North-West Region, did not exceed the average production per hectare registered at national level (5,999 kg/ha) in 2018. At the opposite pole, the lowest average production per hectare for grain cereals was 3,297 kg / ha (2015). A positive aspect in terms of yield per hectare for cereals in the North-West Region is represented by the fact that it increased by 28.0% in 2019, compared to 2014. Productivity per hectare shows the interest of cereal growers to increase this indicator which entails a number of economic advantages. Increasing the average production per hectare for grain cereals is an important goal for every farmer in order to cope better with competitive pressure. In Bihor County, the highest average production per hectare for grain cereals was 5,580 kg / ha (2019), being higher than the average registered in the North-West Region (5,254 kg / ha), in 2019. The lowest average production per hectare for grain cereals in the aforementioned county was 3,358 kg /ha (2015). Productivity per hectare for grain cereals in Bihor County increased by 42.8% in 2019, compared to 2014. In Bistrita-Nasaud County, the most significant average production for grain cereals was registered in 2018 (4,548 kg/ha), and the lowest was 2,400 kg/ha (2015). In Cluj County, the highest average production per hectare for grain cereals was 6,144 kg / ha (2018), which exceeded the average registered in the North-West Region for 2018 (5,736 kg /ha). In Maramures county, the average production per hectare increased by 19.5% for grain cereals, in 2019, compared to 2014. The highest average production per hectare for grain cereals was recorded in Satu Mare County, in 2018 (6,389 kg / ha). In

this county, the average production per hectare increased by 19.2%, in 2019, compared to 2014. In Salaj county, the average production per hectare increased by 25.4%, in 2019, compared to 2014.

Table 5

Dynamics of average production per hectare for grain cereals in the North-West Region, in the period 2014-2019 (kg / hectare)

| Specification                 | 2014  | 2015  | 2016  | 2017  | 2018  | 2019  | 2019/<br>2014<br>(%) |
|-------------------------------|-------|-------|-------|-------|-------|-------|----------------------|
| <b>NORTH-<br/>WEST Region</b> | 4,102 | 3,297 | 3,785 | 4,937 | 5,736 | 5,254 | 128.0                |
| <b>Bihor</b>                  | 3,906 | 3,358 | 3,580 | 4,912 | 5,538 | 5,580 | 142.8                |
| <b>Bistrita-<br/>Nasaud</b>   | 3,163 | 2,400 | 2,837 | 3,821 | 4,548 | 4,147 | 131.1                |
| <b>Cluj</b>                   | 4,358 | 3,256 | 4,084 | 4,459 | 6,144 | 4,966 | 113.9                |
| <b>Maramures</b>              | 3,531 | 2,719 | 3,285 | 5,106 | 5,209 | 4,223 | 119.5                |
| <b>Satu Mare</b>              | 4,724 | 3,687 | 4,422 | 5,551 | 6,389 | 5,632 | 119.2                |
| <b>Salaj</b>                  | 3,486 | 2,881 | 3,332 | 4,587 | 5,053 | 4,372 | 125.4                |

Source: Own processing based on NIS, Tempo- Online Database, 2020

In table no. 6 is presented the evolution of the average production per hectare for the main categories of cereals in the North-West Region of Romania, in the period 2014-2019. For wheat, the highest average production was 4,280 kg/ha (2018). For corn grains, the highest yields per hectare were recorded. In 2018, a maximum yield was reached for corn, this being 7,404 kg / ha. In 2019, the average production per hectare for corn grains registered the highest percentage increase (+44.7%), compared to 2014. Increases for the average production per hectare in 2019, compared to 2014, were registered for: rye (+33.8%); barley (+16.0%); sorghum (+ 12.2%) and oat (+ 9.4%).

Table 6

Dynamics of average production per hectare for the main cereals in the North-West region, in the period 2014-2019 (kg / hectare)

| Specification      | 2014  | 2015  | 2016  | 2017  | 2018  | 2019  | 2019/<br>2014<br>(%) |
|--------------------|-------|-------|-------|-------|-------|-------|----------------------|
| <b>Wheat-total</b> | 3,843 | 3,891 | 3,380 | 4,255 | 4,280 | 4,040 | 105.1                |
| <b>Corn grains</b> | 4,621 | 3,156 | 4,263 | 5,912 | 7,404 | 6,688 | 144.7                |
| <b>Oat</b>         | 2,014 | 1,971 | 2,319 | 2,537 | 2,416 | 2,204 | 109.4                |
| <b>Barley</b>      | 3,586 | 3,400 | 3,952 | 4,580 | 4,509 | 4,162 | 116.0                |
| <b>Sorghum</b>     | 3,049 | 2,804 | 2,816 | 3,122 | 4,055 | 3,424 | 112.2                |
| <b>Rye</b>         | 2,387 | 2,331 | 2,304 | 2,696 | 2,650 | 3,195 | 133.8                |

Source: Own processing based on NIS, Tempo-Online Database, 2020

**Average purchase prices.** Table 7 shows the average purchase prices for the main categories of cereals in the North-West Region of Romania, in the period 2014-2019. The price for wheat varied between 0.58 lei/ kg- 0.73 lei/ kg. In 2019, the average purchase price for wheat remained constant compared to 2014, being 0.72 lei kg. The highest purchase price for corn was 0.6 lei kg (2016, 2018), and the lowest was 0.55 lei / kg (2015). For winter barley the highest price was 0.66 lei / kg (2019), and for spring barley it was 0.7 lei / kg (2017).

*Table 7*

Average purchase prices for the main categories of cereals in the North-West region of Romania, in the period 2014-2019 (Lei / kg)

| Specification        | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|----------------------|------|------|------|------|------|------|
| <b>Wheat</b>         | 0.72 | 0.73 | 0.58 | 0.6  | 0.66 | 0.72 |
| <b>Winter barley</b> | 0.5  | -    | 0.5  | 0.58 | 0.6  | 0.66 |
| <b>Spring barley</b> | -    | -    | 0.54 | 0.7  | 0.63 | 0.65 |
| <b>Corn grains</b>   | 0.56 | 0.55 | 0.6  | 0.57 | 0.6  | 0.59 |

Source: Own processing based on NIS, Tempo- Online Database, 2020;  
- lack of data.

In order to increase the competitiveness of the cereal sector in the North-West Region of Romania, farmers must pursue:

- increase of the average production per hectare;
- making associations;
- investments in new technologies;
- investments in order to realize the irrigation systems.

## CONCLUSIONS

In the North-West Region, cereals occupy a significant area of the total cultivated area. Following the analysis of the cereals production and marketing activity in the North-West Region, the following can be deduced:

- In the North-West Region, in 2019, the area cultivated with grain cereals increased by 5.9%, compared to 2014;
- In 2015, Bihor county cultivated the most significant area with grain cereals, of 214,375 ha;
- The largest land area at regional level was cultivated with corn grains (279,496 ha), in 2016;
- The smallest areas at the regional level were cultivated with rye. In 2019, the area cultivated with rye held a share of only 0.2% of the area related to corn cultivation in the analyzed region;

- Total grain cereal production achieved at regional level in 2019, represented only 8.7% of cereal production achieved in Romania;
- The most significant production of grain cereals was achieved in Bihor county, of 1,138,916 tons (2019);
- At the regional level, the largest productions were made for corn grains;
- In 2019, the production of corn grains at regional level registered an increase of 44.3%, compared to 2014;
- The highest wheat production was 618,173 tons (2018);
- The lowest production was recorded for rye in 2017 (1,696 tons);
- In Satu Mare county, the most significant average production per hectare for grain cereals was registered, of 6,389 kg / ha (2018);
- The highest yield was obtained for corn grains, of 7,404 kg / ha (2018);
- The average productions per hectare for the main cereal crops registered increases in 2019, compared to 2014;
- The average purchase prices for the main cereals registered variations from one year to another;
- The lowest purchase price for corn was 0.55 lei kg (2015), and the highest was 0.6 lei / kg (2016, 2018).

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