

ABC-XYZ MODEL OF REGIONAL ASSESSMENTS OF CEREALS PRODUCTION

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For a long time Ukraine is the world leader in producing and exporting grain crops such as wheat, maize, and barley. Each region is more or less involved in their cultivation. Evidently, the achieved results differ year by year and among regions. To give an unbiased assessment over this situation we applied a mathematical method of the ABC-XYZ distribution.

In our study, A, B, and C grades corresponded to Large, Average, and Small average regional harvests. Consistent with the traditional ABC distribution, the grade A aggregated 80% of cereals producers. Meanwhile the grades B and C integrated regional growers of the next 15% and last 5% of grain crops. X, Y, and Z grades associated with High, Medium, and Low yields relative to the mean yields across the country. In conformity with the classic XYZ distribution, regions with high yields by over 10% were incorporated in the grade X. The grade Y assembled regions where yields varied between -10% and $+10\%$ around the average one in Ukraine. The grade Z covered the rest of the regions with low yields by over -10% .

The offered distribution among 9 intersections featured 4 groups of regional producers by common prospects in the cereals segment, namely:

- the cells AX, AY, BX, BY embedded the main grain growers;
- the cells AZ, BZ involved producers who should raise their yields through the relevant crop varieties;
- the cells CX, CY engaged growers who should focus on increasing their harvests via expanded sown areas;
- the cell CZ identified regions with an inappropriate agricultural specialization in the national cereals segment.

The research calculations covered 24 regions in Ukraine described by their average yields and harvests of cereals for 2016-2018. The proposed ABC-XYZ model generated assessments given in Table 1-3 concerning wheat, maize, and barley productions. The study concluded that 13 regions were the key national wheat producers. 6 regions ought to tackle low yields. 4 regions should enlarge the wheat sown areas. 1 region must revise its cereals' specialization (see Table 1). According to Table 2, 12 regions were the major maize growers. 5 regions ought to adjust their maize hybrids. 2 regions should expand the maize sown areas. 5 regions chose a non-optimal cereals' specialization. Table 3 revealed that 12 regions were the core barley producers in Ukraine. 6 regions need to improve barley productivity. 4 regions were advised to augment the barley sown areas. 2 regions selected the non-efficient cereals' specialization.

In our opinion, implementations of the listed recommendations would foster further development of grain production in Ukraine.

Table 1. Output of the ABC-XYZ Model for Wheat

Harvest	Yield		
	X – High	Y – Medium	Z – Low
A – Large	Cherkasy Khmelnyskiy Sumy Ternopil Vinnytsya	Kharkiv Kirovohrad Odesa Poltava	Dnipropetrovsk Donetsk Kherson Mykolayiv Zaporizhyya
B – Average	Kyiv Lviv	Chernihiv Volyn	Luhansk
C – Small	Chernivtsi Ivano-Frankivsk Rivne	Zhytomyr	Zakarpattya

Table 2. Output of the ABC-XYZ Model for Maize

Harvest	Yield		
	X – High	Y – Medium	Z – Low
A – Large	Cherkasy Chernihiv Khmelnyskiy Kyiv Sumy Vinnytsya	Poltava	Kharkiv Kirovohrad
B – Average	Lviv Rivne Ternopil Zhytomyr	Ivano-Frankivsk	Dnipropetrovsk Mykolayiv Odesa
C – Small	Volyn	Kherson	Chernivtsi Donetsk Luhansk Zakarpattya Zaporizhyya

Table 3. Output of the ABC-XYZ Model for Barley

Harvest	Yield		
	X – High	Y – Medium	Z – Low
A – Large	Khmelnyskiy Ternopil Vinnytsya	Kharkiv Odesa Poltava	Donetsk Donetsk Kherson Kirovohrad Mykolayiv Zaporizhyya
B – Average	Cherkasy Ivano-Frankivsk Kyiv Lviv Rivne Sumy	–	–
C – Small	Chernihiv	Chernivtsi Volyn Zhytomyr	Luhansk Zakarpattya