REPORT

«Skhidne» LLC

Crop type: winter wheat

Field: #7, observations in April and May 2021, yield forecasting

Kharkiv oblast, Balakliya Rayon, village Skhidne

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1. Weather conditions

The analysis of weather and climate data showed that during the spring growing season in April-May 2021, the content of available soil moisture was insufficient. In April, there was no more than 25 mm of precipitation, in May - up to 17 mm. In early April, night frosts were observed, which negatively affected the formation of generative organs.

In general, the conditions of the spring growing season were not entirely favorable for the development of winter wheat. At the time of the survey, the crops were in good condition due to the fact that during the critical periods of generative organs formation there were no significant drops and high temperatures.

2. General comments on the state of the crops

The winter wheat crops of Skhidne LLC were inspected on 28-29.04 and 30-31 May 2021. The condition of the crops at the time of the inspection was good. The stages of plant development are the beginning of stemming (at the end of April) and earing (at the end of May). The predecessor is soybean. Plants are developed quite evenly. The density of productive shoots is 390 - 420 pcs/m2. The winter wheat crops have not suffered any losses or deaths.

2.1 Forecast of the yield

Yield forecasting was carried out on the basis of using vegetation parameters of winter wheat plants according to remote sensing data. The variation of yields in the field was determined and productivity zones were identified for two periods of research. The predicted average yield over the field is 5.95 t/ha at the beginning of stemming and 6.62 t/ha in the earing phase. Uneven development of the crop across the field was observed at the beginning of the earing phase.

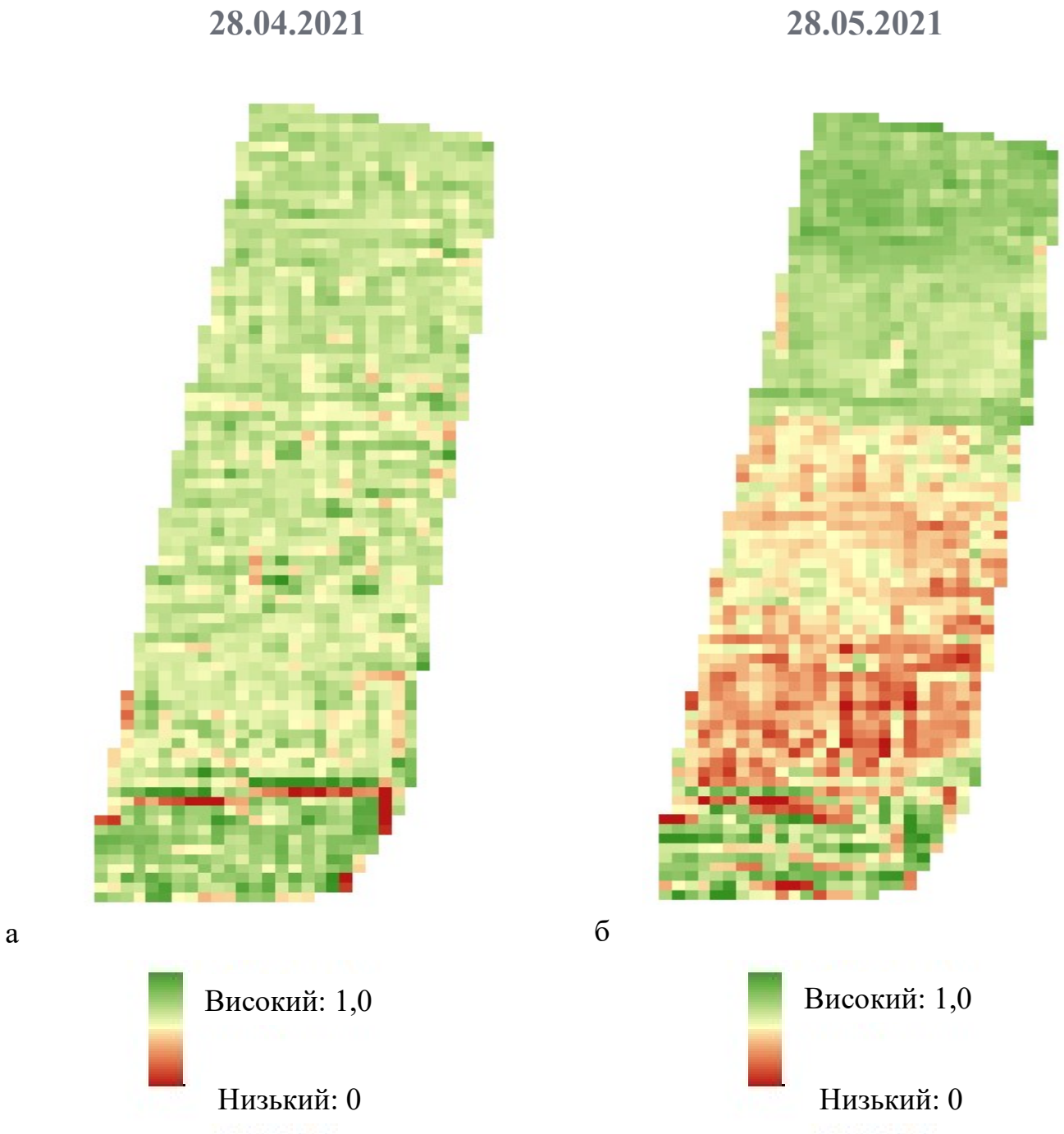
Statistical analysis of the distribution of yields across the field showed that yields varied from < 1.34 t/ha to 8.28 t/ha in the stemming phase, and from 1.23 t/ha to 10.7 t/ha in the earing phase.

The most representative zone in the field is the zone with a yield of 3.9-6.0 t/ha, which is 49% of the field area (beginning of stemming), and the zone of 6.5-8.5 t/ha - 55%, respectively, in the earing phase.

The predicted value of the gross biological yield varies significantly across the productivity zones and ranges from 0.03 to 54.87 tons at the beginning of the stemming phase to 0.02 to 71.96 tons at the earing phase.

Low gross yields in some locations are associated with small areas with very poorly developed plant biomass.

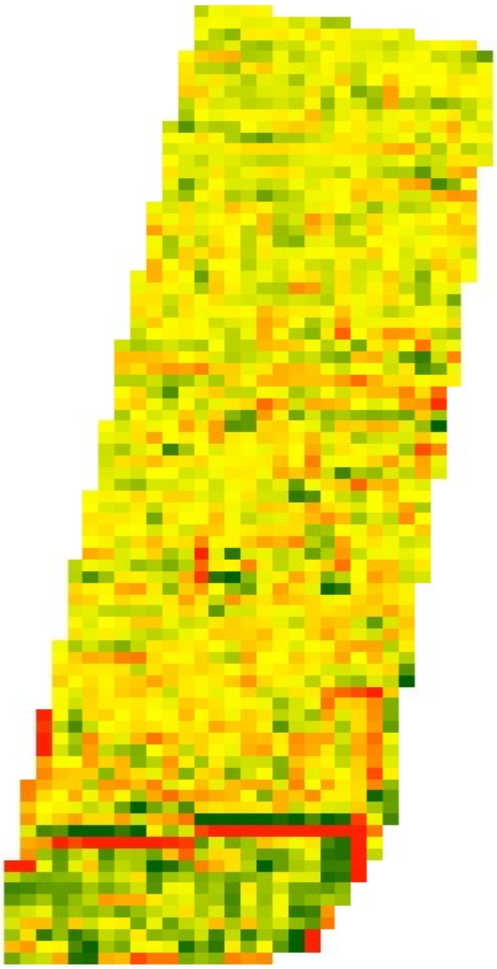
Spring vegetation and general state of the crop



Distribution of NDVI values at the beginning of stemming phase (a) and at the earing phase (б)

Yield forecasting

28.04.2021



High: 8,0

Low: 4,0

Yield forecast at the beginning of stemming phase - 5,95 t/h

SE1 - 8,46%

SE2 – 1,85%

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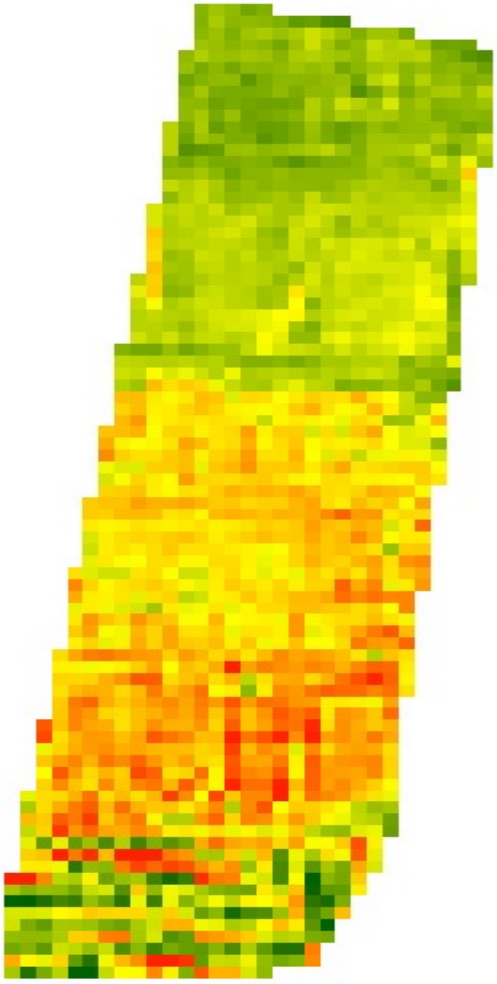

High: 8,0

Low: 4,0

Yield forecasting at the beginning of earing phase – 6,62 t/h

*SE- Standard error

Yield zones

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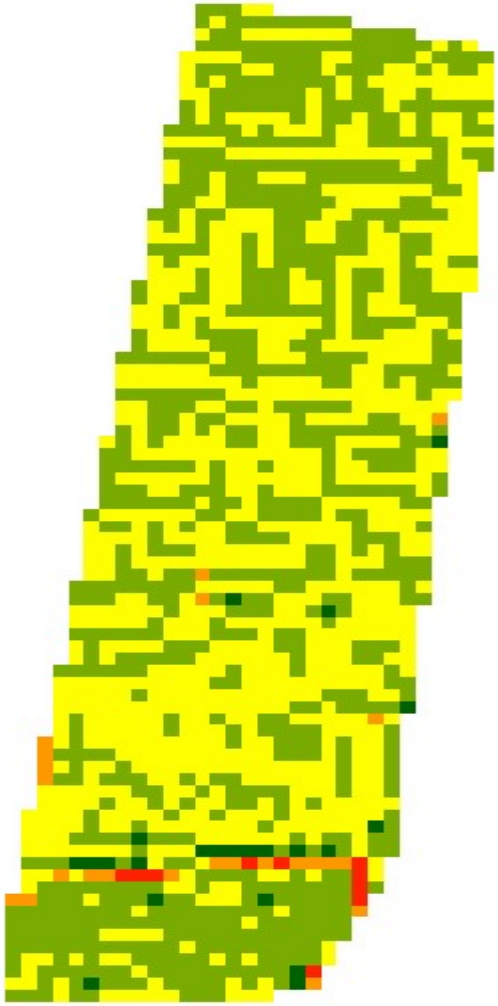

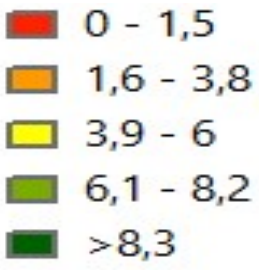

Yield zones, t/h

(early stemming phase)

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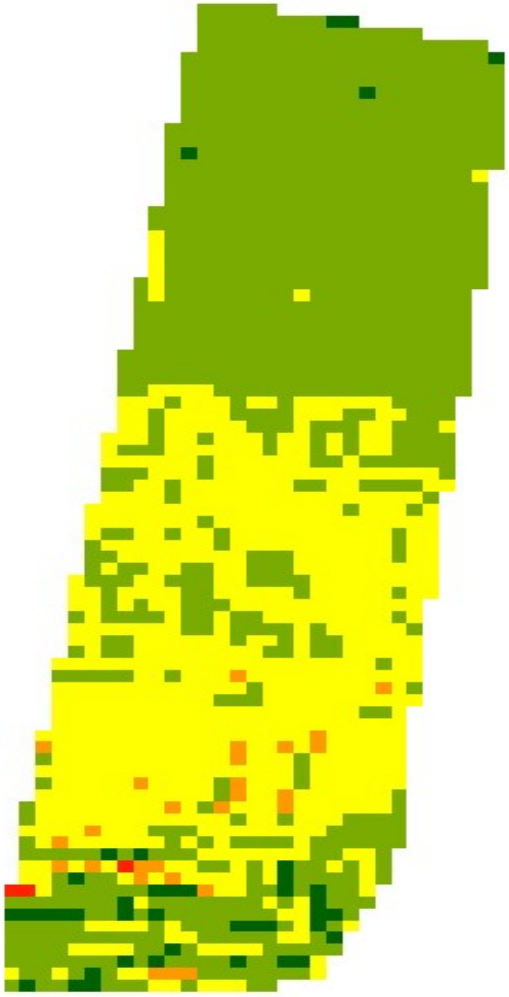

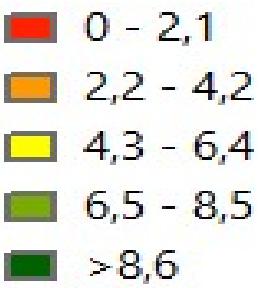

Yield zones, t/h

(earing phase)

Yield distribution histogram (pixel by pixel)

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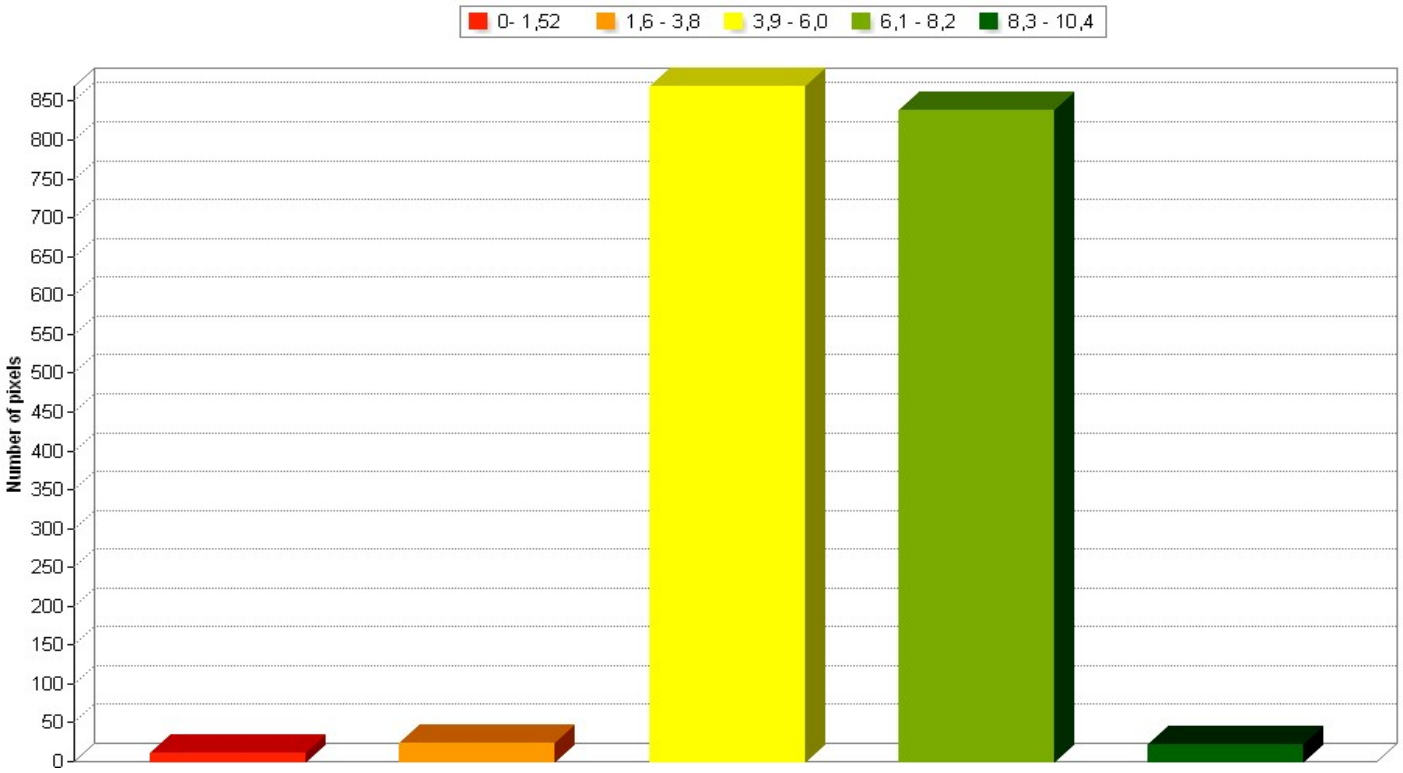
Yield distribution histogram, t/h



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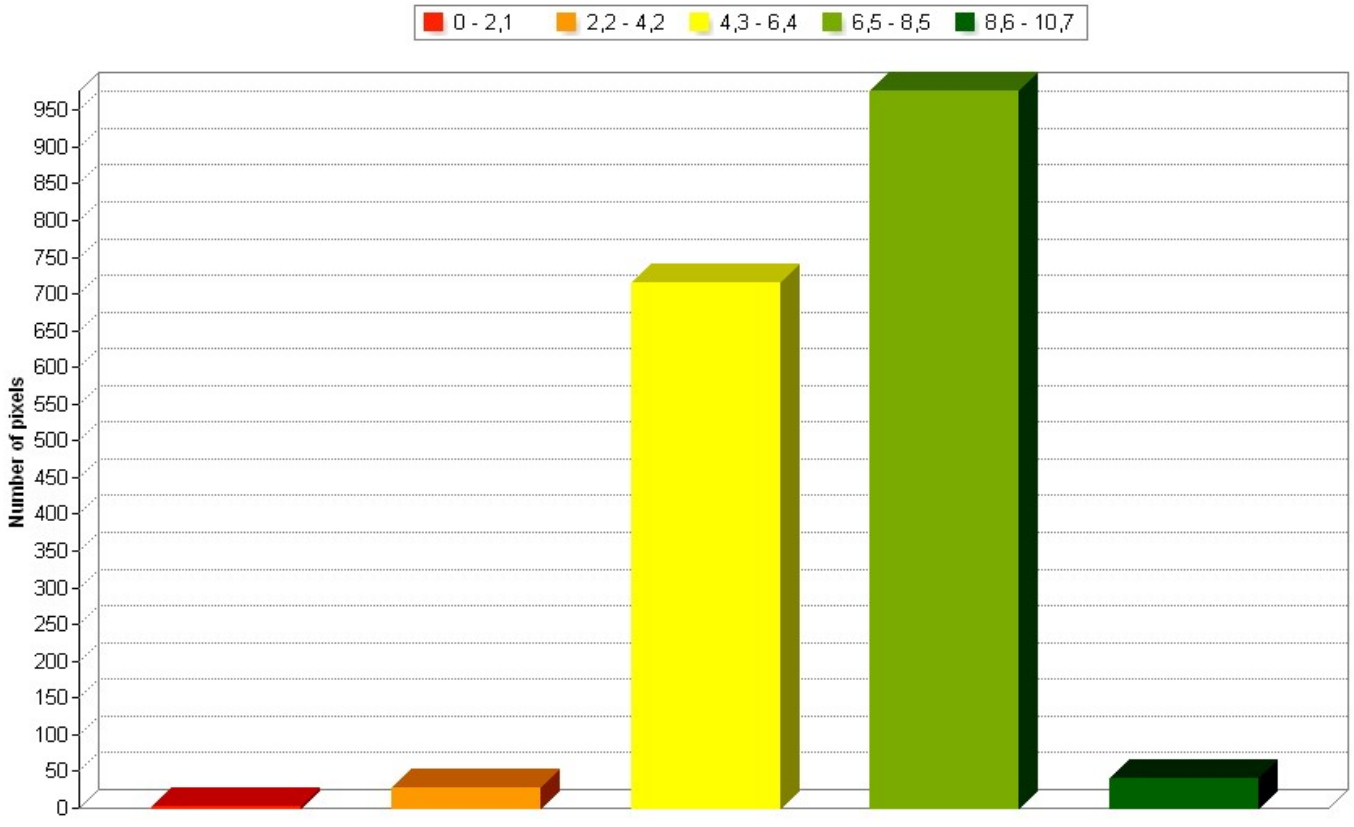
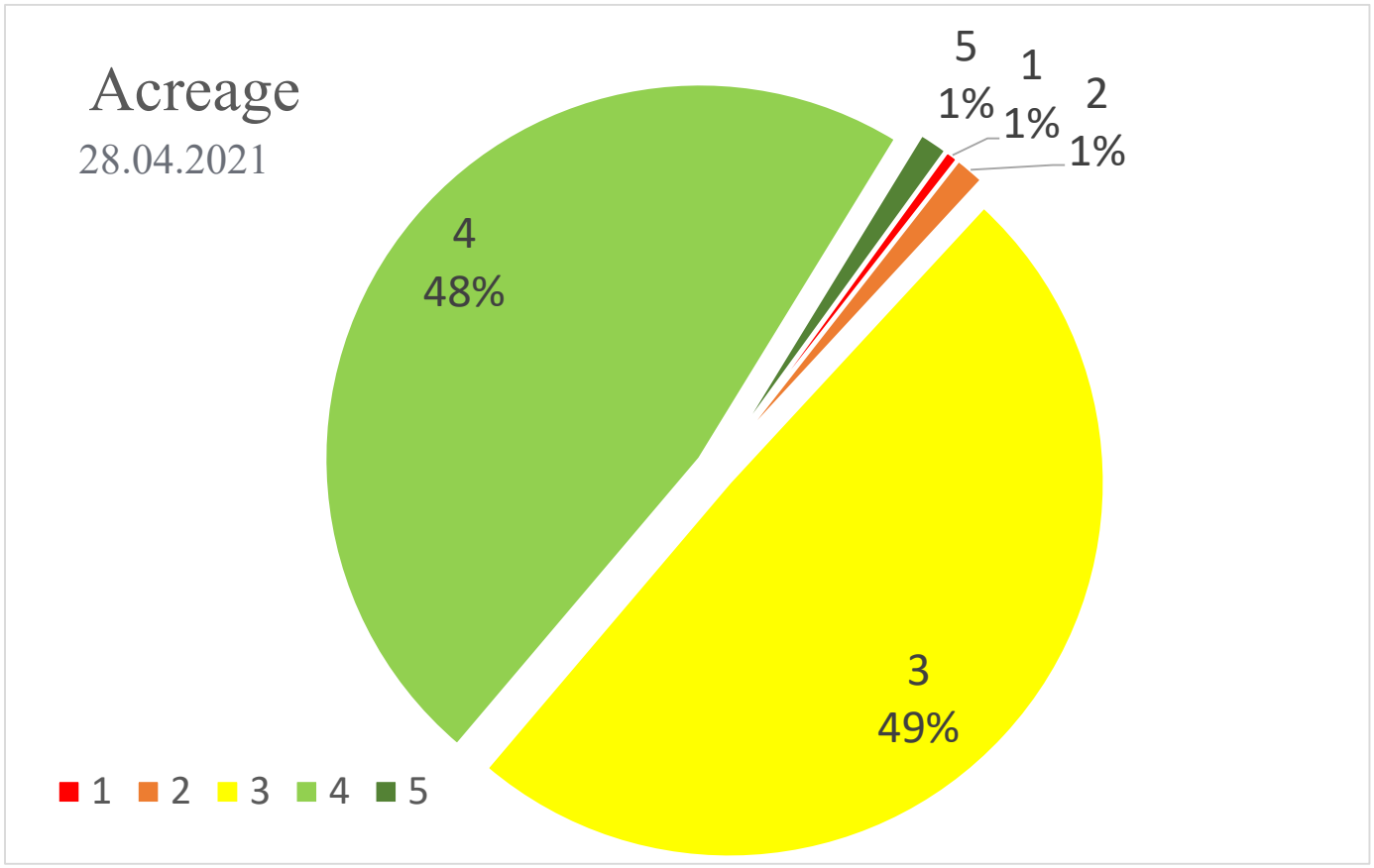
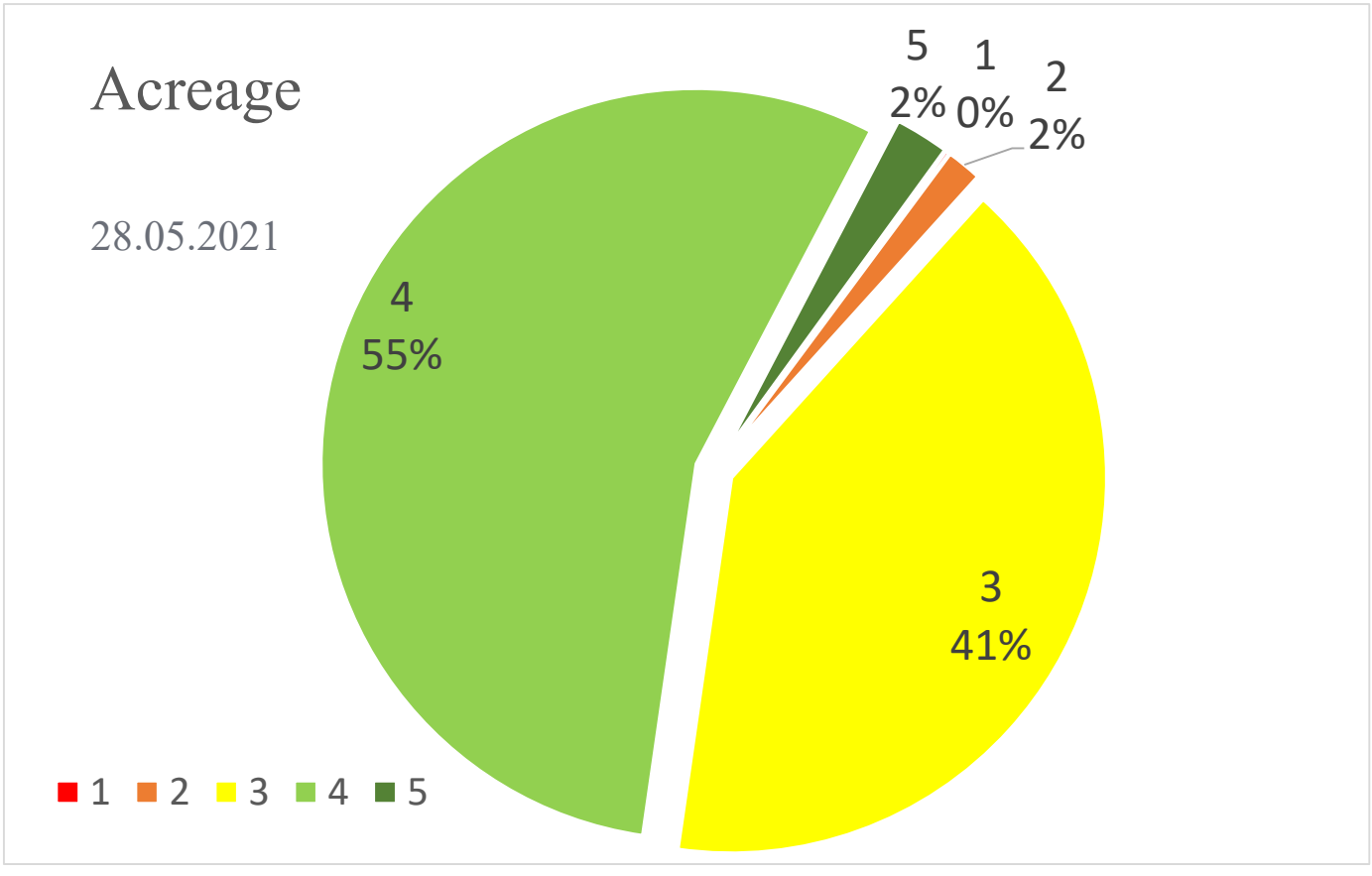
Yield distribution histogram, t/h



Yield zones acreages to the field acreage ratio





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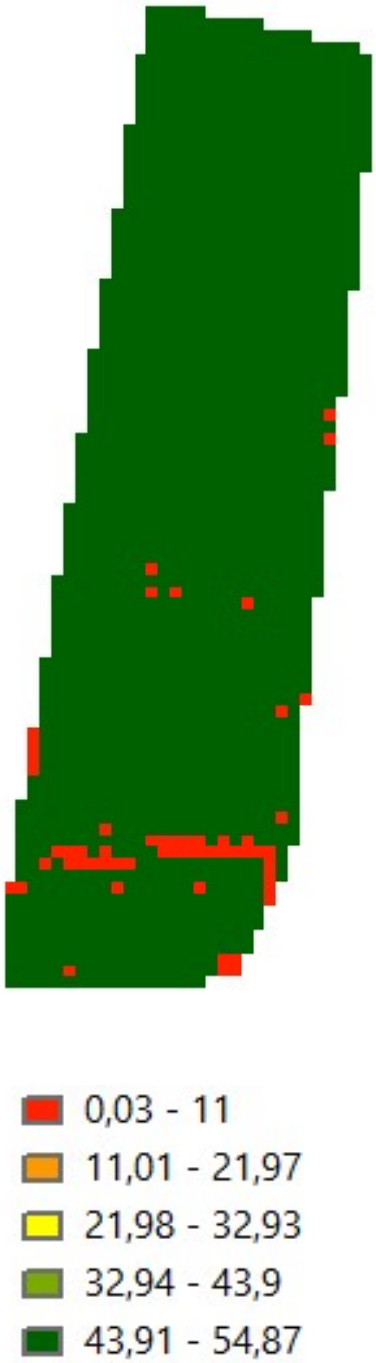
Zones	1	2	3	4	5
Yield t/h	0 - 1,5	1,6 – 3,8	3,9 – 6,0	6,1 – 8,2	8,3 – 10,4
Acreage of zone, ha	0,1	0,23	8,69	8,38	0,22
MIN	-0,71	1,56	3,77	5,99	8,28
MAX	1,34	3,72	5,99	8,19	10,46
RANGE	2,05	2,16	2,22	2,20	2,18
MEAN	0,33	2,80	5,46	6,55	8,89
STD	0,70	0,72	0,44	0,48	0,61
SUM	3,28	64,31	4741,87	5486,64	195,52
Gross biological harvest, t	0,03	0,64	47,42	54,87	1,96

28.05.2021

Zone	1	2	3	4	5
Yield, t/h	0 - 2,1	2,2 – 4,2	4,3 – 6,4	6,5 – 8,5	8,6 – 10,7
Acreage of zone, h	0,03	0,27	7,15	9,76	0,41
MIN	-0,09	2,15	4,23	6,39	8,55
MAX	1,23	4,21	6,38	8,51	10,70
RANGE	1,32	2,06	2,15	2,12	2,16
MEAN	0,60	3,63	5,61	7,37	9,07
STD	0,54	0,56	0,55	0,52	0,53
SUM	1,79	98,11	4011,06	7196,03	371,69
Gross biological harvest, t	0,02	0,98	40,11	71,96	3,72

28.04.2021



Gross biological harvest per zone (stemming phase)

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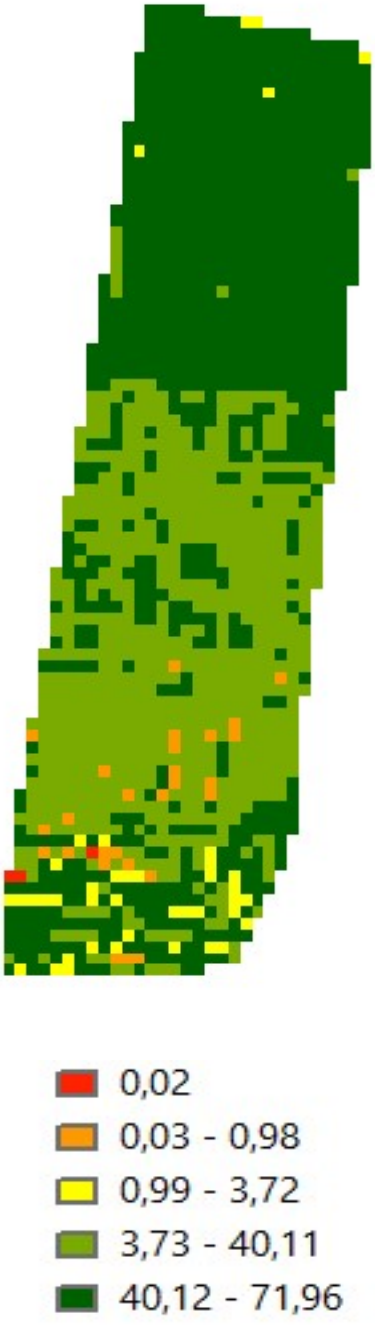

Gross biological harvest per zone (earing phase)

Gross biological harvest per field

17,62 ha

Acreage of field

104,92 t

Gross biological harvest, t

17,62 ha

Acreage of field

116,79 t

Gross bio harvest

Conclusions of the expert

Based on the results of the inspection, it can be stated that winter wheat crops are in good condition and with further favorable weather conditions, especially moisture supply, it is possible to form the planned yield.

The gross harvest on the field area may reach 116.79 tons.