



# Evaluation of the resistance of some varieties and lines of triticale (*Triticosecale wittmack*) to the attack of the pathogene *Puccinia striiformis* in the climatic conditions of 2023 – ARDS Pitești-Albota



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## Introduction

In Romania, although it has not been cultivated for a very long time, the *Triticosecale* species has begun to gain ground because, as a result of genetic advances in breeding, a series of varieties with high production potential and stability have been created, competitive with grassy cereals and even corn, especially for hilly areas with poorly fertile soils, low pH and high aluminum ion content. (Ittu et al., 2005). Foliar and ear diseases in wheat and triticale crops represent a permanent risk factor for the stability and quality of production ( Bărbulescu et al. 2002; Popov et al. 2005 ). Yellow rust, caused by *Puccinia striiformis*, is currently considered one of the most important diseases, the high virulence of the pathogen on both triticale and wheat has been determined and reported by many pathologists. In 2019, Cotuna et al. observed yellow rust attacks ranging from 10 to 90% in different triticale genotypes. Recently in 2023, Cotuna drew attention to the fact that yellow rust is wreaking havoc on susceptible varieties in the west of the country. In 2023 Voica et al., mentioned the danger posed by yellow rust in several areas of the country, including the south. In recent years, an increase in the frequency of yellow rust attacks has been observed, both in Romania and throughout the world, which represents a serious alarm signal.

## Materials and methods

We study the behavior of triticale cultivars to the attack of yellow rust under natural infection conditions, as well as production and productivity elements, observations on biological material from experiments with comparative cultures with triticale varieties and lines, carried out in 2023 at ARDS Pitești-Albota, represented by 25 native triticale varieties and lines, coming from the National Institute for Agricultural Research and Development Fundulea and the Teleorman Agricultural Research and Development Station, were used. The soil in the experimental field of ARDS Pitești-Albota is an albic luvisol with a clayey texture, low in plant-accessible nutrients, with an acid pH and a high content of aluminium ions. The comparative crops were placed in a balanced square grid, with 25 variants in 3 repetitions, with plots of 8 rows, row spacing of 12.5 cm, with a harvestable area of 7 m<sup>2</sup>. To study the behavior of these triticale cultivars to the action of pathogens, the frequency (F%), attack intensity (I%) and attack degree (AD%) were calculated.



Figure 1. *Puccinia striiformis* Westend f.sp. tritici – symptoms and uredosporia on leaves and spike of triticales (original)

## RESULTS AND DISCUSSIONS

Variant	Density pl/m <sup>2</sup>	F% Attack frequency	I % Attack Intensity	A.D % Attack degree
CASCADOR	640	95,0	86,0	81,7
PLAI	584	90,5	52,0	47,0
TITAN	612	90,0	64,0	57,6
STIL	632	92,5	78,0	72,1
HAIDUC	628	96,0	76,0	71,0
NEGOIU	624	90	67,5	60,7
ODA FD	592	86,5	62,0	53,6
PISC	624	90,0	74,0	66,6
TULNIC	616	97,0	68,0	65,9
UTRIFUN	620	92,0	64,0	58,8
VIFOR	600	78,0	70,0	54,6
VULTUR	620	95,0	82,0	77,9
ZORI	596	85,5	62,0	53,0
ZVELT	572	74,0	48,0	35,5
ZARAZA	542	27,5	12,0	3,3
FDL ASCENDENT	576	78,0	50,0	39,6
FDL CORDIAL	568	95,0	27,0	25,6
TELEORMAN 1	580	75,5	57,0	43,0
TELEORMAN 2	564	70,0	30,0	21,0
TELEORMAN 3	552	64,0	32,0	20,4
TELEORMAN 4	560	54,0	30,0	16,2
TELEORMAN 5	556	55,6	27,0	15,0
TELEORMAN 6	544	52,4	25,0	13,1
TELEORMAN 7	572	84,0	45,0	37,8
TF2	568	54,0	46,0	24,8

Table 1. Attack of the pathogen *Puccinia striiformis* on triticale cultivars and lines monitored in 2023 at ARDS Pitești-Albota

	Variant	(I %) Severity attack	Difference from control (-+)	Signification
1	CASCADOR (Control variant)	86,00	-	-
2	PLAI	52,00	-34	000
3	TITAN	64,00	-22	00
4	STIL	78,00	-8	-
5	HAIDUC	76,00	-10	-
6	NEGOIU	67,50	-18,5	-
7	ODA FD	62,00	-24	000
8	PISC	74,00	-12	-
9	TULNIC	68,00	-18	00
10	UTRIFUN	64,00	-22	00
11	VIFOR	70,00	-16	0
12	VULTUR	82,00	-4	-
13	ZORI	62,00	-24	000
14	ZVELT	48,00	-38	000
15	ZARAZA	12,00	-74	000
16	FDL ASCENDENT	50	-36	000
17	FDL CORDIAL	27	-59	000
18	TELEORMAN 1	57	-29	000
19	TELEORMAN 2	30	-56	000
20	TELEORMAN 3	32	-54	000
21	TELEORMAN 4	30	-56	000
22	TELEORMAN 5	27	-59	000
23	TELEORMAN 6	25	-61	000
24	TELEORMAN 7	45	-41	000
25	TF2	46	-40	000
LSD 5 %			12,46	
LSD 0,1%			17,04	
LSD 0,01 %			22,23	

Table 2. Severity Attack of the pathogen *Puccinia striiformis* on triticale cultivars and lines monitored in 2023 at ARDS Pitești-Albota

	Variant	F% Attack frequency	Difference from control (-+)	Signification
	CASCADOR (Control variant)	95,00	0,00	Mt.
1	PLAI	90,50	- 4,50	-
2	TITAN	90,67	- 4,33	-
3	STIL	92,50	-2,50	-
4	HAIDUC	96,00	1,00	-
5	NEGOIU	90,00	- 5,00	-
6	ODA FD	85,50	- 9,50	-
7	PISC	90,00	- 5,00	-
8	TULNIC	97,00	2,00	-
9	UTRIFUN	92,00	-3,00	-
10	VIFOR	73,00	- 22,00	000
11	VULTUR	94,33	- 0,67	-
12	ZORI	85,50	- 9,50	-
13	ZVELT	74,00	-21,00	000
14	ZARAZA	15,00	-80,00	000
15	FDL ASCENDENT	78,00	-17,00	00
16	FDL CORDIAL	91,33	-3,67	-
17	TELEORMAN 1	75,50	-19,50	00
18	TELEORMAN 2	70,00	-25,00	000
19	TELEORMAN 3	64,00	-31,00	000
20	TELEORMAN 4	54,00	-41,00	000
21	TELEORMAN 5	55,60	-39,40	000
22	TELEORMAN 6	52,40	-42,60	000
23	TELEORMAN 7	84,00	-11,00	-
24	TF2	54,00	-41,00	000
25				
LSD 5%			11,74	
LSD 1%			15,68	
LSD 0,1 %			20,46	

Table 3. Attack frequency of the pathogen *Puccinia striiformis* on triticale cultivars and lines monitored in 2023 at ARDS Pitești-Albota

## CONCLUSIONS

The genotypes analyzed responded differently to the pathogen attack:

The disease incidence recorded the highest value (F= 97%) in the Tulnic variety, while the Zaraza variety had a low attack frequency (F=27.5%), this being the lowest value among the triticale genotypes analyzed. The intensity % recorded very different values, ranging between I = 12% for the Zaraza variety (the most resistant of the genotypes analyzed) and I = 86% for the Cascador variety, with the highest sensitivity among the analyzed varieties. Regarding the analyzed lines, the intensity values ranged between 25% for the Teleorman 6 line and 57% for the Teleorman 1 line. The differences in attack recorded may be due to both the high density of plants per square meter, but especially the genetic resistance of the triticale genotypes.

The intensity of the infection depends primarily on the genetic resistance of the cultivated variety, but also on meteorological conditions such as: temperature, air humidity, wind direction and intensity. Cultivating rust-resistant varieties presents a number of advantages such as: reducing or even eliminating chemical treatments; not incurring additional costs after choosing the cultivars and eliminating the negative effects on the environment created by pesticide products used to combat the yellow rust attack.

## REFERENCES

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