v. 4, n. 3, 2024

Journal of Agricultural Sciences Research

REGIONAL TRIAL OF WHITE OAT LINES CONDUCTED IN MAUÁ DA SERRA – PR, 2022

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The development of new cultivars that are superior in grain yield, technological quality and resistant to biotic (diseases) and abiotic (environmental stress) factors, is fundamental for maintaining a thriving agriculture and contributes enormously to the stability of regional food industries (PACHECO et al.).

The Regional Trial of White Oat Lines (ERLA) constitutes the initial experimental tests of VCU, involving the highlighted lines from the Preliminary Trials conducted by the Genetic Improvement Programs. The results obtained from this trial will define whether or not a lineage is capable of being promoted to the second- and third-year trial called Brazilian White Oat Lineage Trial (EBLA), thus aiming for commercial launch. These trials are coordinated by the Brazilian Oat Research Commission (CBPA) and conducted in a network by participating institutions.

The objective of this work was to evaluate, in the Mauá da Serra - PR region, the behavior of strains that make up ERLA 2022, regarding grain yield and other variables of agronomic and technological interest.

The experiment was conducted in the Mauá da Serra region, northern Paraná, and was installed on the Estância 3M Farm, privately owned by partner Luiz Meneghel Neto, in a distroferric Red Oxisol (SANTOS et.al.), located at the following geographic coordinates: 23° 58' S and 51° 19' W and altitude of 847 m. The rainfall in the experimental period (May to September) was: 110, 75, 0, 115, and 165 mm, respectively.

The experimental design used was randomized blocks, with four replications. In total, 27 strains were evaluated. Sowing was carried out on 05/9/2022, with emergence occurring on 05/18/2022. Base fertilization was carried out using 250 kg. ha^{-1} of the 10-30-10 formula. Each plot consisted of six six-meter rows. The sowing density used was 300 suitable seeds per m^2 and the spacing between lines of 0.17m.

The following evaluations were carried out: Yield of deared grains – RG, Days from emergence to flowering – DEF, Days from emergence to maturation – DEM, Plant height – EP, Reaction to leaf rust – FF, Hectoliter weight – PH, and Mass of a thousand grains – MMG, whose main results are presented in Table 2.

The data obtained were subjected to analysis of variance and the means of the genotypes grouped by the Scott-Knott test at a 5% probability level, using the Genes computer program (CRUZ, 2006).

By analysis of variance, significant differences ($P \leq 0.01$) were found between the genotypes for all characteristics evaluated (Table 1).

The main results obtained from the ERLA conducted in the Mauá da Serra region, in the 2022 harvest, are presented in Table 2.

The average grain yield of the trial was 3688 kg/ha. With an average RG of 3656 kg/ha, the cultivar IPR Artemis proved to be the best control in the Mauá da Serra environment, being significantly surpassed by eight lines (UFRGS 16Q6010-1L, UFRGS 16Q6010-3L, UFRGS 206084-3, UFRGS 206085-1, UFRGS 207026-2, UFRGS 207038-4, UFRGS 207039-7 and UFRGS 208020-1).

The evaluated genotypes showed good variability for the DEF character, with lines occurring with an average period that varied from 58 to 75 days, with the IPR Altiva control flowering at 58 days. Four lines were precocious, similar to IPR Altiva, namely: UFRGS 207042-7, UFRGS 208024-1, UFRGS 206084-3 and UFRGS 207042-2.

Although variability was also observed for the DEM trait, which ranged from 102 to 126 days, the vast majority of lines were later than URS Altiva. In the group of the earliest ones, the following stood out: AL 21007, UFRGS 208024-1, UFRGS 206084-3, UFRGS 206085-

1, and UFRGS 207039-7.

EP was a characteristic with wide variability in the group of genotypes evaluated, ranging from 107cm (AL 21007) to 154 cm (UFRGS 206347). Lines with a height similar to the control IPR Artemis (132 cm) were: AL 21001, AL 21004, UFRGS 19Q9006-3, UFRGS 19Q9007-2, UFRGS 207038-4, UFRGS 208024-1, and UFRGS 208020-1.

Although significant differences were detected between the genotypes for the variable susceptibility to FF, 17 (seventeen) lines were similar to the IPR Artemis cultivar, presenting a very low level of infection, indicating that several promising lines for this characteristic were developed.

In relation to PH, the variability found was 43 to 58 kg/hl, with the best control URS Altiva having a PH of 51 kg/hl. Sixteen lines were superior to the best control in the experiment.

The assessment for MMG was carried out in a single repetition, and no analysis of variance was carried out. However, ten lines presented values higher than 32 g, which was the value obtained by the best control URS Altiva.

Based on the results obtained in the ERLA conducted in the Mauá da Serra region, several lines are capable of being promoted, as they surpassed the grain yield of the best test control. The decision on promoting the best strains to the 2023 EBLA will be made based on the results of the joint analysis to be carried out, considering all environments in which ERLA 2022 was conducted and evaluated by the different CBPA member institutions.

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FV	GL	Medium Square					
		RG	DEF	DEM	EP	FF	PH
Blocks	3	429584.4	0.64	3.51	144.08	62.03	7.44
Treatment	26	5143278.7 **	97.5**	136.8 **	424.84 **	875.0 **	76.86 **
Residue	78	512625.2	2.22	3.54	41.76	41.04	4.61
CV (%)		19,42	2,23	1,63	4,66	58,14	4,08

**= significant at 1% probability by the test F; FV= Source of Variation; GL= Degree of Freedom; RG= Grain Yield; DEF= Days from Emergence to Flourishing; DEM= Days from Emergence to Maturation; EP= Plant Height; FF= Reaction to Leaf Rust; PH= Weight of Hectoliter.

Table 1: Summary of the analysis of variance of the Regional Trial of White Oat Lines (ERLA) in traits of agronomic interest, Mauá da Serra, PR, 2022.

Grow crops	RG (kg/ha)	DEF (days)	DEM (days)	EP (cm)	SFF (%)	PH (kg/hl)	MMG (g)
URS Brava	2432 c	70 b	115 d	145 b	38 a	51 c	29
URS Altiva	1745 d	58 g	102 g	132 c	45 a	51 c	32
IPR Artemis	3656 b	69 b	116 d	129 c	0 c	48 d	29
AL 21001	3468 b	74 a	121 b	132 c	11 c	54 b	33
AL 21004	3787 b	69 b	115 d	131 c	20 b	55 b	31
AL 21007	3450 b	65 d	108 f	107 d	23 b	50 c	31
CGF 62007	2662 c	67 c	118 c	151 a	23 b	49 c	30
CGF 62010	2333 c	66 d	117 c	140 b	25b	45 d	27
CGF 62013	1709 d	68 c	122 b	146 b	21 b	45 d	34
CGF 62020	1252 d	69 b	119 c	145 b	38 a	43 e	26
CGF 62026	2383 c	68 c	115 d	143 b	38 a	46 d	27
UFRGS 16Q6010-1L	5071 a	72 a	126 a	152 a	0 c	52 c	28
UFRGS 16Q6010-3L	5112 a	71 b	126 a	152 a	0 c	51 c	30
UFRGS 19Q9003-4	3616 b	74 a	123 b	137 b	0 c	52 b	29
UFRGS 19Q9006-3	3934 b	75 a	123 b	129 c	0 c	53 b	28
UFRGS 19Q9007-2	3796 b	75 a	122 b	131 c	0 c	53 b	30
UFRGS 206084-3	5255 a	61 f	110 e	145 b	0 c	56 a	38
UFRGS 206085-1	5303 a	64 e	110 e	143 b	0 c	57 a	37
UFRGS 206343-2	3727 b	69 b	118 c	150 a	0 c	58 a	32
UFRGS 206347-2	4136 b	66 d	113 d	154 a	0 c	57 a	34
UFRGS 207026-2	4587 a	65 d	114 d	140 b	0 c	57 a	39
UFRGS 207038-4	4392 a	63 e	115 d	135 c	0 c	58 a	40
UFRGS 207039-7	4921 a	66 d	111 e	138 b	5 c	56 a	37
UFRGS 207042-2	4298 b	61 f	116 d	149 a	0 c	56 a	40
UFRGS 207042-7	3754 b	58 g	110 e	138 b	5 c	57 a	42
UFRGS 208024-1	4250 b	59 g	108 f	126 c	0 c	57 a	31
UFRGS 208020-1	4539 a	66 d	115 d	132 c	0 c	56 a	30
AVERAGE	**3688**	**67**	**116**	**139**	**11**	**53**	**32**
C.V.(%)	19.42	2.23	1.63	4.66	58.14	4.08	

Means followed by the same letter in the column constitute statistically homogeneous groups using the Scott-Knott test at 5% probability. RG= Grain Yield; DEF= Days from Emergence to Flourishing; DEM= Days from Emergence to Maturation; EP= Plant Height; SFF= Leaf Rust Severity; PH= Weight of Hectoliter; MMG= Thousand Grain Pasta.

Table 2: Grouping of means from the Regional Trial of White Oat Lines (ERLA) into characters of agronomic interest, Mauá da Serra, PR, 2022.