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THE BEHAVIOUR OF THE OANA MAIZE HYBRID TO THE ATTACK OF PATHOGENIC AGENTS, BY USING CHEMICALLY TREATED SEED, AT THE AGRICULTURAL RESEARCH AND DEVELOPMENT STATION OF PODU-ILOAIEI, IAŞI COUNTY

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ABSTRACT *– The results of experimental investigations, conducted during 2001-2003 at the Agricultural Research and Development Station of Podu-Iloaiei, on the behavior of the Oana maize hybrid, treated with insectofungicides, for the prevention and diminution of the attack of pests and pathogens during plant sprouting and vegetation, have shown that the products used for seed treatment, before sowing, ensured a good plant germination, sprouting and development. The attack of Agriotes spp. was much diminished in the variants treated with insecticides (F%=0-0.6) and in the ones where insectofungicides were used (F%=0-0.7). At the fungicide-treated variant, the attack was greater (5.4%-7.4%). Under conditions of using insectofungicides, the attack of pathogenic agents (Drechslera turcica and Gibberella roseum) has registered the lowest values (F%=1.1, respectively, 2.4).*

Key words: Oana maize hybrid, pathogenic agents, pests, treated seed, insectofungicides

REZUMAT - Comportarea hibridului de porumb Oana la atacul de agenţi patogeni, în condiţiile utilizării de sămânţă tratată chimic la S.C.D.A. Podu-Iloaiei, jud Iaşi. *Rezultatele studiilor şi cercetărilor experimentale, efectuate în perioada 2001-2003 la S.C.D.A. Podu-Iloaiei, privind comportarea hibridului de porumb Oana, cu sămânţă tratată cu insecto-fungicide, pentru prevenirea şi reducerea atacului de patogeni şi dăunători, în perioada răsăririi şi vegetaţiei plantelor, evidenţiază următoarele: produsele folosite la tratamentul*

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semințelor, înainte de semănat, au asigurat o bună germinație, răsărire şi dezvoltare a plantelor; atacul de Agriotes spp. a fost mult diminuat la variantele tratate cu insecticide (F%=0-0,6) şi la cele la care s-au folosit insectofungicide (F%=0-0,7). La varianta tratată cu fungicide, atacul a fost mai mare (5,4%-7,4%). În condițiile folosirii de insectofungicide, atacul agenților patogeni (Drechslera turcica şi Gibberella roseum) a înregistrat cele mai reduse valori (F%=1,1, respectiv 2,4).

Cuvinte cheie: hibribul de porumb Oana, agenți patogeni, dăunători, sămânță tratată, insectofungicide

INTRODUCTION

During 2001-2003, a comparative crop of the Oana maize hybrid was set up at the Agricultural Research and Development Station of Podu-Iloaiei, by using chemically treated seed (Baicu, 1971; Baicu, 1982; Şandru, 1996). The aim of our experiment was to investigate the behaviour of this hybrid during many years and to point out the influence of the products used for maize seed treatment on the frequency (F%) of the attack of pathogenic agents in this hybrid.

MATERIALS AND METHODS

In Oana maize hybrid, seed has been chemically treated with one of the following products: Tiradin 500 SC (tiram 70%) – fungicide; Semafor (bifentrin 200 g/l) – insecticide; Gaucho 600 FS (imidacloprid 600 g/l) – insecticide; Miclodan Extra 335 (myclobutanil 5% + thiophanate methyl 20% + lindane 35%) – insectofungicide.

The experiment was carried out in four variants: Variant 1 – treated seed - Tiradin 500 SC (3.5 kg/t); Variant 2 – treated seed– Semafor (2,0 l/ t); Variant 3 – treated seed - Gaucho 600 FS (10.0 l/t) and Variant 4 – treated seed - Miclodan Extra 335 (3.0 l/t).

Each variant was formed of two rows, having the length of 8.5 m. The observations were carried out on seed germination, plant development (height), frequency (F%) of pest attack (as vectors of pathogenic agents).

RESULTS AND DISCUSSION

Table 1 shows that the products used for seed treatment have ensured good seed germination and plant development. The attack of *Agriotes spp*. was much diminished in the insecticide-treated variants (Variant 2 and Variant 3) (F% = 0 – 0.6) and in the variant in which insectofungicide was used (Variant 4) (F% = 0 – 0.7). The attack has registered frequency values between 5.4% and 7.4% in the fungicide-treated variant (Variant 1). The *Ostrinia nubilalis* attack was present during the growth season and was not influenced by the products used for seed treatment.

The frequency of the attack of pathogenic agents, under conditions of using insectofungicides, can be maintained at low values, which ensure high yields.

Table 1 - The efficiency of phytosanitary products (applied at seed treatment in Oana maize hybrid) on plant development and frequency of pest attack at Podu-Iloaiei, during 2001-2003

Variant	Tested product	Rate (l/t)	Year of experiment	Analysed seeds (F%)		Plant height (cm)	Attacked plants (F%)	
				Germinated	Non Germinated		*Agriotes spp.*	*Ostrinia nubilalis*
1	Tiradin 500CS	3,5	2001	91.9	2.7	235	5.4	11.5
			2002	89.2	3.8	218	7.0	7.8
			2003	89.7	3.7	220	7.4	8.6
2	Semafor 20ST	2,0	2001	97.3	2.7	240	0	10.7
			2002	95.1	4.5	210	0.4	7.8
			2003	95.8	4.1	234	0.4	8.6
3	Gaucho 600FS	10,0	2001	97.0	2.5	238	0.5	11.0
			2002	96.0	3.4	225	0.6	5.0
			2003	96.8	3.2	230	0.6	7.0
4	Miclodan Extra 335CS	3,0	2001	98.6	1.4	241	0	12.5
			2002	95.3	4.0	213	0.7	7.5
			2003	96.7	3.2	223	0.5	8.8

Table 2 - The efficiency of phytosanitary products (applied at seed treatment in Oana maize hybrid) on the frequency of pathogen attack at Podu-Iloaiei, during 2001-2003

Variant	Tested product	Rate (l/t)	Year of experiment	Attacked plants (F%)			
				Drechslera turcica	*Sorosporium holci-sorghi*	*Ustilago maydis*	*Gibberella zeae*
1	Tiradin 500CS	3.5	2001	0.5	1.0	0	4.3
			2002	4.3	6.1	1.0	3.1
			2003	5.1	3.2	0.5	2.6
			Average	3.3	3.43	0.5	3.33
2	Semafor 20ST	2.0	2001	2.0	0.5	0.1	1.7
			2002	6.0	4.3	0.2	4.7
			2003	5.7	2.8	0.1	3.4
			Average	4.56	2.53	0.13	3.26
3	Gaucho 600FS	10.0	2001	1.8	1.6	0	1.0
			2002	5.7	4.8	2.1	6.1
			2003	4.8	2.8	1.7	4.2
			Average	4.1	3.06	1.26	3.76
4	Miclodan Extra 335CS	3.0	2001	1.0	1.3	0.2	0.7
			2002	1.0	3.8	3.2	4.0
			2003	1.3	3.6	1.1	2.5
			Average	1.1	2.9	1.5	2.4

The attack of the pathogenic agents *Drechslera turcica* and *Gibberella zeae*, which are the most frequent ones and cause the greatest damages, has registered the lowest values of frequency (1.1%, respectively, 2.4%), under conditions of using insectofungicides for seed treatment.

Table 2 shows the efficiency of using complex phytosanitary products – insectofungicides, for seed treatment, in comparison with fungicides or insecticides, used alone.

We recommend the use of insecticides associated with fungicides for seed treatments, as an efficient alternative to the insectofungicide treatment.

CONCLUSIONS

The observations carried out during 2001-2003, at the Agricultural Research and Development Station of Podu-Iloaiei, on Oana maize hybrid, for which we have used seeds chemically treated with different phytosanitary products, show that the products used for seed treatment had a good seed germination and plant development. The attack of Agriotes spp. was much diminished in the insecticide-treated variants (F% = 0 –0.6) and in the variant in which insectofungicides were used (F% = 0 – 0.7). It has registered frequency values between 5.4% and 7.4% in the fungicide-treated variant.

The frequency of the attack of pathogenic agents, under conditions of using insectofungicides, can be maintained at low values, which result in high yields. The attack of pathogenic agents *Drechslera turcica* and *Gibberella roseum*, having the highest frequency in crops and causing the greatest damages, has registered the lowest values of frequency (1.1%, respectively, 2.4%), under conditions of using insectofungicides for seed treatment.

We have demonstrated the efficiency of using complex phytosanitary products – insectofungicides, compared to fungicides or insecticides, used alone.

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