

EFFECTIVENESS OF SEED DRESSINGS IN PROTECTION OF ONION AGAINST ONION FLY (*HYLEMYIA ANTIQUA* MEIG.)

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Abstract: On the basis of the presented studies, it was established that seed dressing by coating protects effectively onion crops against onion fly (*Hylemyia antiqua* Meig.). In all seed dressing treatments, a significant decrease of number of damaged plants was found in comparison to the control. The highest efficacy in protection of onion against onion fly was shown in the case of insecticide Super Homai 70 DS. The effectiveness of this seed dressing reached 80.40% in the year 2001 and 85.44% in the year 2002.

Key words: onion fly, seed dressings, effectiveness

INTRODUCTION

In Poland onion production is of a high economic importance. About 700 thousand ton of onion are harvested every year. This plant ranks in the third position regarding the cultivation area. The share of onion in the export of fresh vegetables is high and amounts to 30%–55% of the total production (Rumpel 2000). Striving to obtain higher yields of high quality onion has become increasingly more frequent. Solutions are requested for in new cultivars, modern growing technologies and plant protection methods, particularly against pests.

In Polish onion plantations 25 species of pests occur. Onion fly (*Hylemyia antiqua* Meig.) undoubtedly belongs to the most dangerous onion pests. The larvae of this pest feeding inside onion plants may significantly decrease the yield, sometimes even by 80% (Szwejd 1996; Narkiewicz-Jodko 1997; Rumpel 2000). Because of a high harmfulness of onion fly, it is essential to elaborate effective methods of controlling this pest. One of them is the chemical method.

The objective of presented studies was the evaluation of efficacy of seed dressing applied by coating seeds with a substance protecting onion plants against onion fly.

MATERIAL AND METHODS

Studies on effectiveness of selected seed dressings in controlling onion fly (*Hylemyia antiqua* Meig.) were carried out in the area of Experimental Station "Marcelin" of the Horticultural Faculty, Agricultural University in Poznań. The experiments were carried out in two years in the period from April 27 till September 19, 2001 and from April 30 till September 23, 2002.

In the first year of studies, treatments with the following seed dressings were applied: Gaucho 350 FS, Promet 400 CS at the dose 50 ml/kg, Super Homai 70 DS at the dose 60 g/kg, Nomolt 150 SC at the dose 70 ml/kg and Zaprawa Marshal 250 DS at the dose 70 g/kg. In untreated control, no seed dressing was used.

In the second year of studies, the same preparations were applied except for seed dressing Gaucho 350 FS. This preparation was excluded from the experiment because of its phytotoxic effect.

The above mentioned seed dressings were applied as seed coating. Onion seeds, cultivar Sochaczewska were obtained from KOLT Company in Nochów. The effectiveness of seed dressings was evaluated on experimental plots measuring 2×3 m (6 m^2). Each treatment, comprised five replications (plots). On each plot, onion seeds were manually sown in six rows spaced at 30 cm intervals. After germination, observations were carried out. Growing plants were precisely inspected in order to find any damage caused by larvae of onion fly feeding inside the plants. Observations were conducted at 14-day intervals. Damaged plants were counted and obtained results were statistically analysed and compared using Duncan's test at the level of significance $p=0.05$.

RESULTS AND DISCUSSION

The effectiveness of seed dressings in protection of onion against onion fly (*Hylemyia antiqua* Meig.) in successive two years of studies is shown in table 1. In all seed dressing treatments, a statistically significant decrease of number of damaged plants was found in comparison to the control.

Table 1. Effectiveness of seed dressings in onion protection against onion fly (*Hylemyia antiqua* Meig.) in 2001 and 2002

Seed dressings	Number of damaged plants (Total)		Mean number of damaged plants per one plot		Effectiveness of seed dressings in %	
	2001	2002	2001	2002	2001	2002
Gaucho 350 FS	38	–	2.53 a	–	84.51	–
Super Homai 70 DS	48	58	3.20 a	3.35 a	80.40	85.44
Zaprawa Marshal 250 DS	56	97	4.00 ab	4.85 a	75.50	78.91
Nomolt 150 SC	61	93	4.07 ab	5.10 a	75.08	77.83
Promet 400 CS	108	163	7.20 b	9.05 b	55.91	60.65
Control	245	461	16.33 c	23.00 b	–	–

Mean values marked with the same letter do not differ at the significance level $P=0.05$ according to Duncan's test

In 2001, the highest efficacy in protection of onion against onion fly was stated for Gaucho 350 FS. The effectiveness of this seed dressing amounted to 91.86%. However, this seed dressing had a phytotoxic effect on plants because after its application, seeds showed a decreased germination ability. Therefore, this preparation was not applied in the second year of experiments. A high effectiveness of Gaucho 350 FS in protection of onion against onion fly was also reported by Kotliński (1996). The efficacy of this seed dressing with a joint application of adjuvant Polikrust 9.5 PS in the years 1994 and 1995 was 99.00% and 94.00%, respectively. Without adjuvant, the effectiveness was 96.00% and 98.00%. Kotliński (1996), however, has not found any phytotoxic effect after the application of Gaucho 350 FS.

Our studies show that seed dressing with Super Homai 70 DS provided a very good onion protection showing in the year 2001 80.40% and in the year 2002 85.44% efficacy. There are no literature data referring to the effectiveness of Super Homai 70 DS in protection of onion against onion fly.

Successful protection of onion against onion fly was also provided by Zaprawa Marshal 250 DS in 2001 and 2002 showing 75.50% and 85.44% efficacy, respectively. A significantly higher protection was obtained by Kotliński (1996). With the use of Polikrust 9.5 FS, Kotliński (1996) obtained 97.00% effectiveness and 94.00% without adjuvant. In the successive year, his results were still better giving 100.00% of effectiveness. Similar results were obtained by Kotliński (2001) with Zaprawa Marshal 250 DS applied together with fungicides (Zaprawa Funaben T and Apron 35 DS) resulting in 100.00% effectiveness in the first year, and 92.80% of effectiveness in the following year.

In our studies, Nomolt 150 EC in 2001 provided onion protection at the level of 75.08%, and in 2002 at the level of 77.83%. Significantly higher efficacy was recorded by Narkiewicz-Jodko (1995) who obtained 98.00% of protection in the first year and 97.00% in the second year of study.

In our studies, the least effectiveness in protection of onion against onion fly was shown by the seed dressing Promet 400 CS: 55.91% in 2001 and 60.65% in 2002. In the studies carried out by Narkiewicz-Jodko (1995), the application of Promet 400 CS, depending on the observation region, provided 89.9% to 94.5%.

CONCLUSIONS

1. Seed dressing protects effectively onion against onion fly (*Hylemyia antiqua* Meig.). In all seed dressing treatments, a significant decrease of the number of damaged plants was found in comparison to the control.
2. Seed dressing Super Homai 70 DS can be useful in onion protection against onion fly (*Hylemyia antiqua* Meig.).

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POLISH SUMMARY

SKUTECZNOŚĆ ZAPRAW NASIENNYCH W OCHRONIE CEBULI PRZED ŚMIETKĄ CEBULANKĄ (*HYLEMYIA ANTIQUA* MEIG.)

Badania nad skutecznością działania zapraw nasiennych w zwalczaniu śmietki cebulanki (*Hylemyia antiqua* Meig.) przeprowadzono na terenie Stacji Doświadczalnej „Marcelin” Wydziału Ogrodniczego Akademii Rolniczej w Poznaniu. Obserwacje prowadzono przez dwa lata, tj. w okresach od 27 kwietnia do 19 września 2001 roku i od 30 kwietnia do 23 września 2002 roku.

W badaniach zastosowano następujące kombinacje zapraw nasiennych: Gaucho 350 FS, Promet 400 CS w dawce 50 ml/kg, Super Homai 70 DS w dawce 60 g/kg, Marshal 250 DS w dawce 70 g/kg, Nomolt 150 SC w dawce 70 ml/kg. Obserwacje prowadzono na cebuli odmiany Sochaczewska.

We wszystkich kombinacjach zapraw nasiennych stwierdzono istotne obniżenie liczby uszkodzonych roślin przez śmietkę cebulankę w porównaniu z kontrolną. Wysoką skutecznością działania charakteryzowała się zaprawa Super Homai 70 DS. Efektywność tej zaprawy wynosiła 80,40% w 2001 roku i 85,44% w 2002 roku. Najniższą skuteczność działania wykazywała zaprawa Promet 400 CS, tj. 55,91% w 2001 roku i 60,65% w 2002 roku.