APPLICATION OF NEW INSECTICIDES IN THE CONTROL OF CEUTORHYNCHUS ASSIMILIS AND DASYNEURA BRASSICAE IN WINTER RAPE

Mrówczyński Marek, Ciesielski Florian, Witkowski Witold
Institute of Plant Protection, Poznań, Poland

I. Introduction

The major pests of winter rape in Poland, occurring during flowering, are two species: the pod weevil /Ceutorhynchus assimilis Payk./ and pod midge /Dasyneura brassicae Winn./. The yield losses presently caused by these pests are significant and tend to increase /Czajkowska, Dmoch, 1975; Lewartowski, Piekarczyk, 1987/. The control of these pests should be commonly used everywhere, where damages are measurable.

An efficient protection of winter rape against pests is plant spraying with relevant chemicals /Alford et al., 1979; Pierre et al., 1983; Roa, Garnier, 1983; Skrocki, 1978/. Until now, however, the assortment of these chemicals has not been wide and only some of the insecticides used for rape protection may be applied for the control of the pod weevil and pod midge /Mrówczyński, Ciesielski, 1983; Mrówczyński et al., 1984/. The main barrier in their application is the toxicity to bees and a long period of prevention /Benedek, 1983 a; Benedek, 1983 b; Bacquet et al., 1983; Shires, Murray, 1983/. Hence there was an urgent need in Poland to study not only effective, but also safe to bees new chemicals, which upon their registration may find a wide application in rape protection. For that purpose the Institute of Plant Protection in Poznań started in 1980 a cycle of experiments on the estimate of the effectiveness of a dozen or so new insecticides, which may be suitable for rape protection during its flowering. Characteristics of the studied chemicals are given in Table 1 /Mrówczyński et al., 1984; Stevenson

et al., 1979; Twinn, Lacy, 1979; Worthing, 1987/.

II. Methods

The field trials on the estimate of the effectiveness of new insecticides were carried out on production rape plantations.

The studied chemicals were applied at different rates. Comparable chemicals were: Thiodan 35 fluid, and Zolone 30 WP. Rape was sprayed at full flowering using pneumatic apparatus, the rate of the working liquid being 300 dm^3/ha. An estimate of the effectiveness of separate chemicals was made during rape ripening. For that purpose 400 pods were randomly collected from each field /in 4 replications with 100 pods each/ and then analysed for the infestation degree by the larvae of the pod weevil and pod midge. The obtained results are given in per cent of injured pods. The results are summarized in Tables 2 and 3.

III. Discussion of Results

On rape plantations the pod injuries caused exclusively by the pod weevil on the control fields was on the average 22.8%, whereas pod damages caused together by the pod weevil and pod midge averagely amounted to 35.4%. On the fields sprayed with the studied chemicals the percentage of injured pods in separate years was from several to over a dozen times lower.

The performed experiments showed that most of the studied new chemicals were sufficiently effective in controlling pod pests in flowering winter rape. No pronounced differentiation in the effectiveness of the new studied chemicals was found in different years, whereas the comparative compounds, Thiodan 35 fluid and Zolone 30 WP, which have been generally recommended until now for the control of the pod weevil and pod midge in Poland, displayed a markedly weaker action.

IV. Conclusions

On the basis of the performed experiments on estimating the effectiveness of new insecticides in the control

of pod pests it has been found that:

1. The pod weevil and pod midge occurred on the fields covered by the experiments at a large intensity and caused serious pod damages;
2. the new insecticides effectively controlled the pod weevil and pod midge, reducing pod injuries manyfold.

References

1. Alford D., Gould H., Graham C., 1979. Chemical control of seed weevil /Ceutorhynchus assimilis/ on winter oil -seed rape in the UK 1975-78. Proceedings British Crop Protection Conference - Pest and Diseases: 111-116.
2. Benedek P., 1983 a. Toxicity of synthetic pyrethroid insecticides to honeybees. 10th International Congress of Plant Protection: 717.
3. Benedek P., 1983 b. Zolone formulations as safe on bees insecticides on flowering winter rape fields. VI-International Rapeseed Conference, Paris: 1120-1125.
4. Bacquet J., Pastre P., Baumeister R., 1983. Bilan de cing annees d'etudes de l'effet de la deltamethrine sur abeilles en conditions naturalles. VI-International Rapseed Conference, Paris: 1114-1119.
5. Czajkowska M., Dmoch J., 1975. Badania nad pryszczarkiem kapustnikiem /Dasyneura Brassicae Winn./. I. Obserwacje nad biologią i ekologią szkodnika na rzepaku ozimym. Rocz. Nauk. Roln., E, 5/1/: 87-98.
6. Lewartowski R., Piekarczyk K., 1987. Stan fitosanitarny roślin uprawnych w Polsce w 1986 roku i spodziewane występowanie agrofagów 1987 roku. IOR, Poznań: 27-31.
7. Mrówczyński M., Ciesielski F., 1983. Zwalczanie szkodników łuszczynowych w rzepaku nowymi insektycydami. Ochrona Roślin, 4: 8-9.
8. Mrówczyński M., Witkowski W., Ciesielski F., Wachowiak H., 1984. Zastosowanie nowych insektycydów do zwalczania chowacza podobnika /Ceutorhynchus assimilis Payk./ i pryszczarka kapustnika /Dasyneura brassicae Winn./ w rzepaku ozimym. Materiały XXIV Sesji Naukowej IOR, Poznań: 209-217.
9. Pierre J., Penot P., Auclert B., Pouzet A., Strizyk S.,

1983. Ceutorhynchus assimilis. Etude en laboratorie de l'influence de la temperature sur l'efficacite et la remanence de differents types de produits insecticides. VI-International Rapseed Conference, Paris: 1202-1208.

10. Roa L., Garnier P., 1983. Interet de la deltamethrine pour lutter contre les ravageurs du colza. VI-International Rapseed Conference, Paris: 1184-1189.
11. Shires S., Murray A., 1983. A field study on the effects of a new insecticide, Fastac, on honeybees. 10th International Congress of Plant Protection: 716.
12. Skrocki C., 1978. Porównanie preparatów chemicznych w zwalczaniu pryszczarka kapustnika /Dasyneura brassicae Winn./ i chowacza podobnika /Ceutorrhynchus assimilis Payk./ na rzepaku ozimym. Rocz. Nauk Rol., E, 8/1/; 57-66.
13. Twinn D., Lacy J., 1979. Honeybee tolerance to phosalone applied to winter oil seed rape. Proceedings British Crop Protection Conference - Pest and Diseases: 121-128.
14. Worhting C., 1987. The Pesticide Manual. British Crop Protection Council, London.

Table 1

Characteristics of the insecticides used for the control of Ceutorhynchus assimilis Payk. and Dasyneura brassicae Winn.

Preparations	Producer	Active ingredient	Prevention period for bees in hours
Ambush 25 EC	ICI	permethrin	2
Bancol 50 WP	Takeda	bensultap	6
Cybolt 100 EC	Cyanamid	flucythrinate	6
Cymbush 10 EC	ICI	cypermethrin	3
Cymbush 25 EC	ICI	cypermethrin	3
Cyperkil 25 EC	Chemie Linz	cypermethrin	3
Decis 2,5 EC	Roussel-Uclaf	deltamethrin	1
Decis 2.5 flow	Roussel-Uclaf	deltamethrin	1
Evisect S	Sandoz	thiocyclam	3
Fastac 10 EC	Shell	alphamethrin	1
Karate 2.5 EC	ICI	cyhalotrin	1
Mavrik 2 E	Sandoz	fluvalinate	2
Permasect 25	Sandoz	permethrin	2
Polytrin 200 EC	Ciba-Geigy	cypermethrin	3
Ripcord 10 EC	Shell	cypermethrin	3
Sherpa 25 EC	Rhône-Poulenc	cypermethrin	3
Sumialpha 5 EC	Sumitomo	esfenvalerate	1
Sumicidin 20 EC	Sumitomo	fenvalerate	4
Talstar 10 EC	FMC	biphenthrin	3
Thiodan 35 fluid	Hoechst	endosulfan	5
Torak 48 EC	Schering	dialifos	1
Trebon 30 EC	Nichimen	ethofenprox	3
Trebon 10 flow	Nichimen	ethofenprox	3
Zolone 35 EC	Rhône-Poulenc	phosalone	3
Zolone 30 WP	Rhône-Poulenc	phosalone	3
Zolone 50 flow	Rhône-Poulenc	phosalone	3

Table 2

The effectivenes of insecticides from the group of organophosphorus compounds, carbamates and others against Ceuterhynchus assimilis Payk. and Dasyneura brassicae Winn. in the years 1980-1986.

Preparations	Doses used in kg or dm^3 per 1 ha	Averege per cent of injured pods		
		pod weevil	pod weevil + pod midge	total injury
Dancol 50 WP	0.75	1.3	1.0	2.3
Dancol 50 WP	1.0	0.5	0.5	1.0
Dviesect S	0.5	8.5	7.3	15.8
Dviesect S	0.7	5.9	3.7	9.6
Thiodan 35 fluid	1.5	16.3	10.7	27.0
Torak 48 EC	1.0	8.6	7.0	15.6
Trebon 30 EC	0.15	1.6	1.0	2.6
Trebon 30 EC	0.3	0.7	0.4	1.1
Trebon 10 flow	0.3	2.0	1.7	3.7
Trebon 10 flow	0.6	0.7	1.0	1.7
Zolone 35 EC	3.0	8.1	6.4	14.5
Zolone 30 WP	3.0	12.3	7.2	19.5
Zolone 50 flow	2.0	6.2	5.9	12.1
Control	-	22.8	12.6	35.4

Table 3

The effectiveness of pyrethroids against Ceutorhynchus assimilis Payk. and Dasyneura brassicae Winn. in the years 1980-1986

Preparations	Doses used in kg or dm^3 per 1 ha	Average per cent injured pods		
		pod weevil	pod weevil + pod midge	total injury
Ambush 25 EC	0.1	10.9	5.6	16.5
Cybolt 100 EC	0.5	0.7	1.0	1.7
Cymbush 10 EC	0.25	4.4	3.5	7.9
Cymbush 25 EC	0.1	1.2	0.8	2.0
Cyperkil 25 EC	0.1	0.8	0.2	1.0
Decis 2.5 EC	0.3	3.7	2.3	6.0
Decis 2.5 flow	0.3	1.7	1.9	3.6
Fastac 10 EC	0.075	2.2	1.6	3.8
Fastac 10 EC	0.1	1.6	1.0	2.6
Fastac 10 EC	0.12	0.5	0	0.5
Karate 2.5 EC	0.25	0.7	0.4	1.1
Karate 2.5 EC	0.3	0.7	0.3	1.0
Karate 2.5 EC	0.4	0.5	0	0.5
Mavrik 2 E	0.2	2.7	2.2	4.9
Mavrik 2 E	0.25	0.7	1.6	2.3
Mavrik 2 E	0.3	1.2	0.5	1.7
Permasect 25	0.1	11.9	6.0	17.9
Polytrin 200 EC	0.12	0.5	1.0	1.5
Ripcord 10 EC	0.25	3.7	2.2	5.9
Sherpa 25 EC	0.1	1.1	1.0	2.1
Sumialpha 5 EC	0.2	0.6	0.8	1.4
Sumialpha 5 EC	0.25	0	0.5	0.5
Sumicidin 20 EC	0.3	3.6	2.6	6.2
Sumicidin 20 EC	0.5	1.0	0.5	1.5
Talstar 10 EC	0.05	3.5	3.0	6.5
Talstar 10 EC	0.075	2.2	2.2	4.4
Talstar 10 EC	0.1	0.5	1.0	1.5
Control	-	22.8	12.6	35.4