

## WINTER RAPE PROTECTION IN POLAND

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In 1986 highest during 40 year period winter rape yield has been obtained, amounting to 1304 thousands tonnes. So high yield is the results both of increase of rape area and of improvement of cultivation, new varieties as well as modernization of rape protection against pests, weeds and diseases.

Number of pest and diseases species occurring in rape cultures in Poland is high, but their economical importance is different in separate regions of the country and in successive years. Damages of rape plants caused by most important pest species in 1981-1986 are presented in Table 1.

Many pest species are of low, sometimes local importance so in this report only important pest and disease species will be discussed according to their importance in separate development stages of rape plants.

One of the pest occurring on winter rape in the earliest period and requiring control treatments is cabbage stem flea-beetle /*Psylliodes chrysocephala* L./. Its noxiousness consists in the feeding of larvae in the veins and petioles as well as in basal part of plant, mainly during autumn development of plants. These damages cause plant freezing in winter period.

The occurrence of cabbage stem flea-beetle is distinctly differentiated in separate regions of rape culture. Plant damages caused by cabbage stem flea-beetle during last 10 years in separate regions of the country are presented in the Figure 1.

Against cabbage stem flea-beetle seed dressing is applied. Presently two seed dressing are applied: OFTANOL T /izophenphos + thiram/ and FURADAN 35 ST /carbofuran/ with the addition of fungicidal seed dressing containing thiram and carbendazim.

Seed dressing protects simultaneously rape plants against cabbage gall weevil *Ceutorhynchus pleurostigma* Mrsh./ occurring in the same time, but of lower importance for rape plants. Average per cent of rape plants damaged by the larvae of cabbage gall weevil during last 10 years is presented on the Figure 2.

Applied seed dressing protect rape plants against other, occasionally occurring pests such as: flea-beetles *Phyllotreta* spp./, flies *Hylemyia* = *Phorbia* spp./ and mining flies *Phytomyza* spp./.

Turnip ceutorhynchus *Ceutorhynchus napi* Gyll./ is one of most important rape pests. Its noxiousness consists in high destructive influence of eggs laid into the stem as well as in the damages caused by feeding larvae. Deformation of plants and checking of their development cause high decrease of rape yield. In the regions where chemical treatments against this pests have not been applied - rape plantation must be ploughed down, especially in the case of drought or other conditions unfavourable for the plants. The occurrence of turnip ceutorhynchus is highly differentiated in separate regions of rape culture, and its extension and numerousness changes all the time.

Occurrence of turnip ceutorhynchus in last 10 years - according to the per cent of damaged rape plants - is presented on the Figure 3.

The condition of effective rape protection against turnip ceutorhynchus is chemical treatment applied after the flight of beetles, but before egg laying. Date of control is announced by plant protection service on the background of registered course of temperature.

Taking into account low temperatures in the period of turnip ceutorhynchus control /in general March, beginning of April/, the choice of pesticide of high activity in low temperatures is of great importance. In Poland most frequently pesticides from the group of synthetic pyrethroids, containing deltamethrin or cypermethrin are applied, and on limited scale organophosphorus pesticides containing chlorfenvinphos or phosalone.

Seedstack curculis /*Ceutorhynchus quadridens* Panz./ is a species commonly and numerously occurring in the regions of rape culture. Occurrence of this pest in Poland during last 10 years according to the per cent of damaged rape plants is presented on the Figure 4. On the background of researches and observations carried out in Poland it has been stated that this species does not cause considerable damages, so its control is not included into the program of rape protection. Early chemical treatment against pollen beetle controls also the beetles of seedstack curculis, occurring somewhat earlier.

Pollen beetle /*Meligethes aeneus* L./ occurs commonly in all the regions of rape culture. The numerousness of this pest is highly differentiated in separate regions and successive years. Losses caused by pollen beetle during last 10 years, expressed in the per cent of damaged buds, are shown on the Figure 5.

The control of pollen beetle is performed commonly since many years on the majority of rape plantations. Presently the following pesticides are applied: synthetic pyrethroids /containing deltametrin or cypermetrin/, organophosphorous /containing chlorfenvinphos or phosalone/ as well as the mixtures of metoxychlor with propoxur or chlorfenvinphos. The necessity of control is determined by plant protection service on the background of average number of beetles occurring on one plant.

Cabbage shoot weevil /*Ceutorhynchus assimilis* Payk./ is a pest of siliques occurring in differentiated numerousness in all the regions of rape culture. It occurs most numerously on the territory of some eastern and north-western voievodships, as it is presented on the Figure 6.

Second pest of siliques is brassica pod midge /*Dasyneura brassicae* Winn./.. Its noxiousness consists in the destruction of siliques by feeding larvae and it is especially high in the years with dry and warm weather during the flight of flies and egg laying. In the experiments carried out in 1983, a year with such weather conditions during May and June, destruction of siliques on control

plots exceeded 50%.

The control of both the silique pests on large plantations is performed using airplane equipment with the products containing deltamethrin or phosalone. Chemical treatments are performed at the beginning of silique formation.

Turnip sawfly *Athalia colibri* L./ occurs occasionally, but it need control treatments during autumn plant development. For the control of this pest - if necessary - products containing deltamethrin are applied in general.

In last years numerous occurrence of cabbage aphid *Brevicoryne brassicae* L./ is observed at the end of rape flowering or during silique development. The result of numerous aphid occurrence is plant covering with honey-dew, which causes the danger of honey-bees poisoning. For this reason cabbage aphid can be controlled only using the products containing pirimicarb or deltamethrin.

Among rape diseases, presently most dangerous is dry rot of cruciferous plants *Leptisphaeria maculans* Ces. et de Not./, occurring on the whole area of rape culture. Numerous plant infection, amounting to 30%, has been stated on some plantations in Opole and Szczecin voievodships.

Up to now the following methods of prophylaxis are recommended: introduction of less susceptible rape variety - Jet Neuf and destruction of sources of infection by ploughing of plant remains. Methods of chemical control are in the course of elaboration.

Chemical control of other diseases is presently introduced into the program of rape protection. It concerns the following diseases: sclerotia rot *Sclerotinia sclerotiorum* Sacc. et Trott./, grey mould *Botryotinia fuckeliana* Whetzel/ and *Alternaria* spp. Against these diseases plant spraying in the period of first silique formation is recommended with the products containing vinclozolin, iprodione or procymidone.

Fungicides applied for seed dressing protect rape seedlings against damping-off *Pythium debaryanum* Hesse, *Ophioidium brassicae* Dangeard, *Fusarium* spp./ and black rot of cruciferous plants.

Apart from above mentioned diseases common occurrence /on the territory of 24 voievodships/ of downy mildew /*Peronospora brassicae* Gaum/ is observed. Methods of control are in the course of elaboration.

Presented in this report most important pests and diseases of winter rape as well as essential methods of control constitute only general information and simplified program of rape protection in Poland. Complete programs are much larger and they are prepared on the background of researches carried out in Poland on the biology and ecology of separate species, on the determination of dates of their appearance, methods of forecasts, economic thresholds on most effective methods of control with regard to biological factors, on new pesticides taking into account both their effectiveness in the control of separate species and safeness for environment. So large and complex researches allow to meet optimal recommendations accomplishing all the requirements, high effectiveness and safeness.

Table 1

Occurrence of main winter rape pests in Poland in 1981-1986

Pest	Per cent of damages in							Damaged parts of plants
	1981	1982	1983	1984	1985	1986	1986	
<i>Meligethes aeneus</i>	12,9	16,8	11,3	18,4	16,2	14,6	buds	
<i>Ceutorhynchus napi</i>	15,5	18,1	16,0	12,8	12,7	11,0	plants	
<i>Ceutorhynchus quadridens</i>	29,6	30,5	27,3	29,2	31,6	29,9	plants	
<i>Ceutorhynchus sesamillie</i>	6,0	6,9	8,6	6,6	5,4	5,1	siliques	
<i>Ceutorhynchus pleurostigma</i>	2,6	4,9	5,6	4,3	4,3	2,3	plants	
<i>Oxyneura brassicae</i>	4,5	5,2	6,5	5,3	4,2	4,4	siliques	
<i>Psylliodes chrysocephala</i>	3,1	3,7	2,9	4,4	2,8	1,7	leaves	

FIGURE 1

**AVERAGE DENSITY OF CABBAGE STEM FLEA-BEETLE (*PSYLLIODES CHRYSOCEPHALA*) IN WINTER RAPE IN POLAND IN 1977-1986**

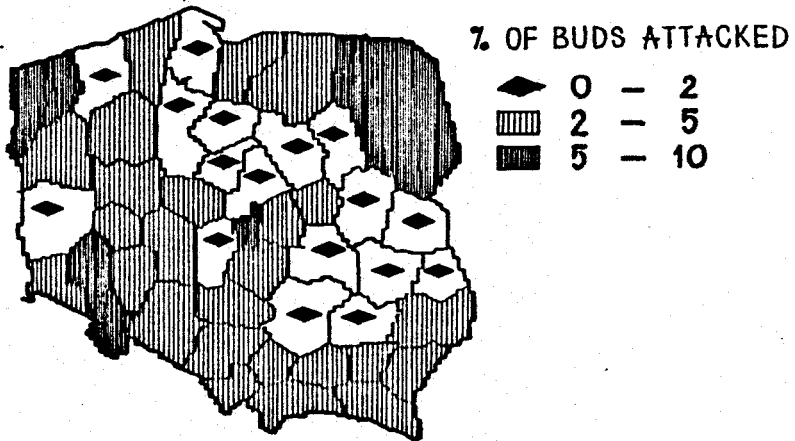


FIGURE 2

**AVERAGE DENSITY OF CABBAGE ROOT WEEVIL (*CEUTORHYNCHUS PLEUROSTIGMA*) IN WINTER RAPE IN POLAND IN 1977-1986**

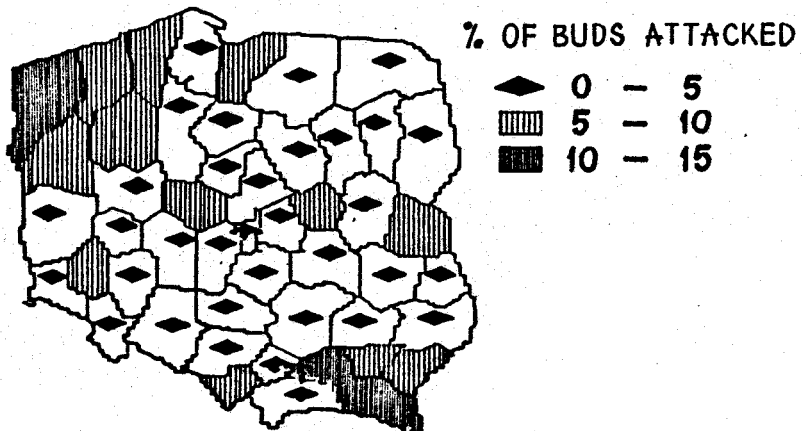


FIGURE 3

**AVERAGE DENSITY OF TURNIP CEUTORHYNCHUS  
(CEUTORHYNCHUS NAPI GYLL.) IN WINTER  
RAPE IN POLAND IN 1977 - 1986**

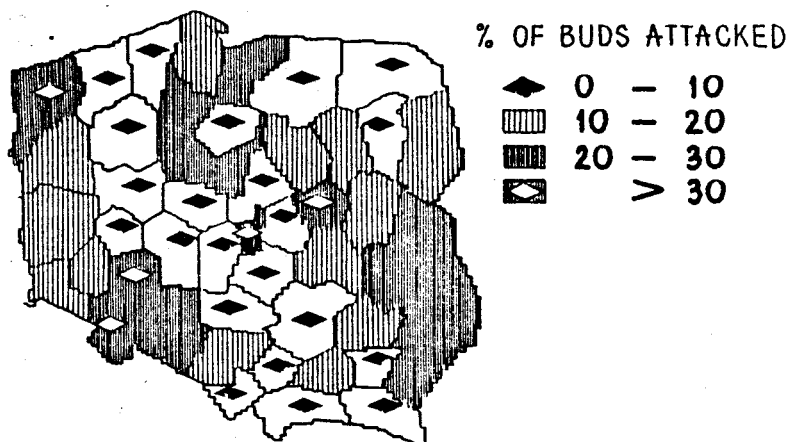


FIGURE 4

**AVERAGE DENSITY OF CABBAGE SEEDSTACK  
CURCULIS (CEUTORHYNCHUS QUADRIDENS )  
IN WINTER RAPE IN POLAND IN 1977 - 1986**

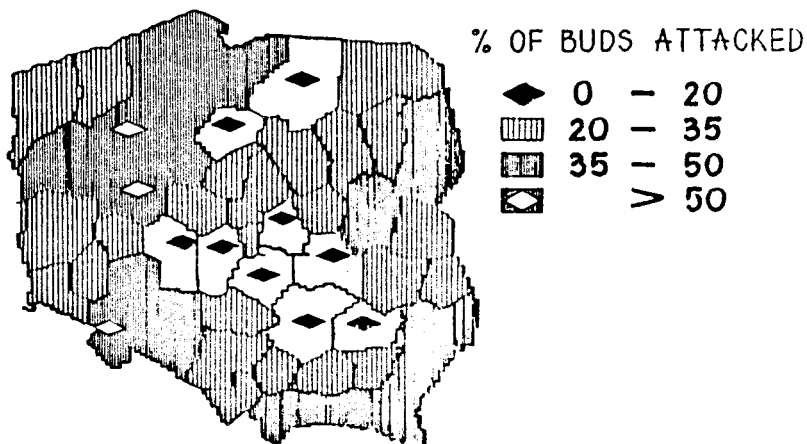




FIGURE 5

**AVERAGE DENSITY OF POLLEN BEETLE  
(MELIGETHES AENEUS) IN WINTER  
RAPE IN POLAND IN 1977-1986**

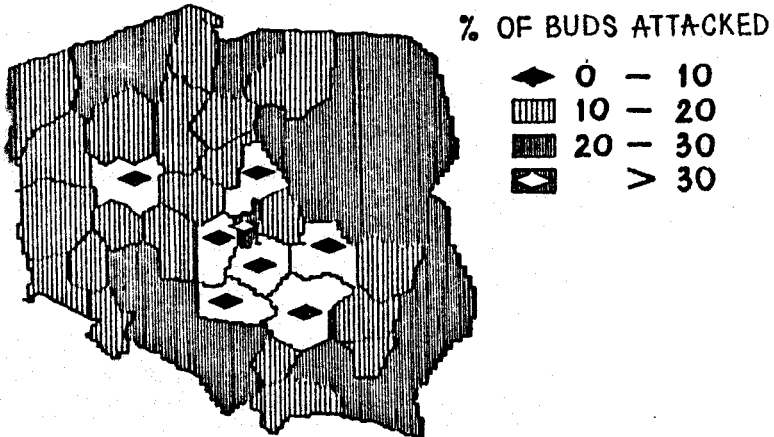


FIGURE 6

**AVERAGE DENSITY OF CABBAGE SHOOT  
WEEVIL (CEUTORHYNCHUS ASSIMILIS)  
IN WINTER RAPE IN POLAND IN 1977-1986**

