Radoslav Koprna
OSEVA PRO Ltd., Research Institute of Oilseed Crops at Opava, Czech Republic

Dynamics of occurrence of winter rapeseed pests in the Czech Republic in the years 1990–2000

Dynamika występowania szkodników rzepaku ozimego w Republice Czeskiej w latach 1990–2000

Key words: rapeseed, pests, dynamics of occurrence

Słowa kluczowe: rzepak ozimy, szkodniki, dynamika występowania

Celem pracy była ocena dynamiki występowania szkodników rzepaku ozimego w Republice Czeskiej w latach 1990–2000. Pierwszy pojaw słodyszka rzepakowego, chowacza brukwiaczka oraz chowacza czterozębnego zależał wyłącznie od sumy aktywnych temperatur (powyżej 10^{o}C). Wzrost powierzchni uprawy nie był skorelowany z pierwszym pojawem tych szkodników. Powierzchnia upraw chronionych przed chowaczami brukwiaczkiem i czterozębnym wzrastała proporcjonalnie do wzrostu powierzchni uprawy rzepaku. Występowanie szkodników łuszczynowych, chowacza podobnika i pryszczarka było częściowo zależne od udziału procentowego chronionej powierzchni w uprawach rzepakowych, jak również zależało od sumy temperatur aktywnych. Powierzchnie chronione przed szkodnikami łuszczynowymi *Ceutorrhynchus assimilis* i *Dasyneura brassicae* były częściowo zależne od sumy temperatur aktywnych w poszczególnych latach. Tylko występowanie mszyc nie korelowało z żadnym z badanych czynników.

The aim of this work was to evaluate the dynamics of winter rapeseed pests in the Czech Republic in the years 1990–2000. The first occurrence of pollen beetle *Meligethes aeneus, Ceutorrhynchus napi* and *Ceutorrhynchus quadridens* depended on the sum of active temperatures over 10°C only, the increase of rapeseed sowing area did not correlate to the first occurrence of these pests. Area protected against *C. napi* and *C. quadridens* increased proportionally to the increase of area under the rapeseed crops. The occurrence of pod insects (*Ceutorrhynchus assimilis and Dasyneura brassicae*) was partially dependent on the percentage of protected area under the rapeseed and also on sum of active temperatures. Area treated against pod pests (*Ceutorrhynchus assimilis* and *Dasyneura brassicae*) partially depended on the sum of active temperatures during several years. Only occurrence of aphids did not correlate to any observed indicators.

Area under the rapeseed crops increased during last ten years more than three times (Fig. 1.). Permanently extension of rapeseed sowing area supports the increase of pest occurrence on winter rape. This extension can also be affected by the course of temperatures, rainfall quantity, crop location etc. Complex evaluation of these factors is necessary for the assessment of dynamics of pest occurrence.

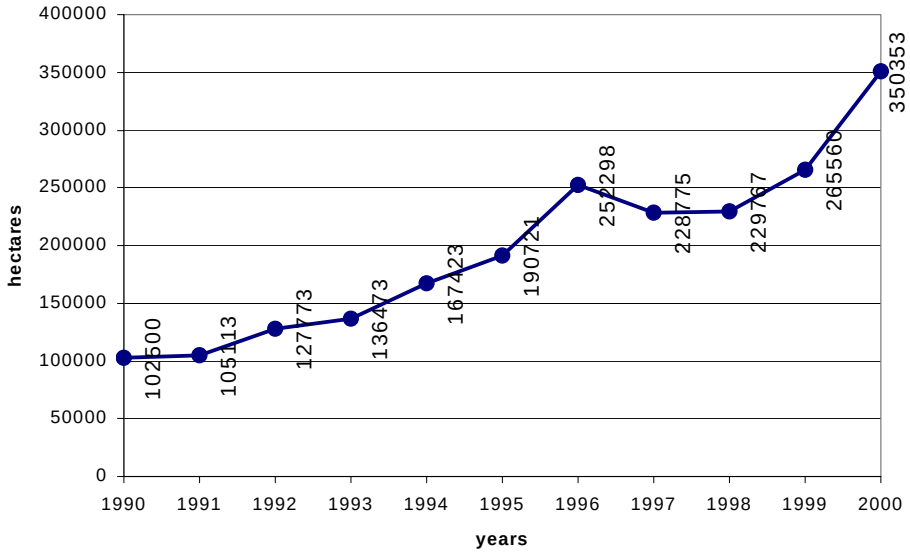

Fig. 1. Increase of rapeseed sowing area in the Czech Republic — *Wzrost powierzchni zasiewów rzepaku w Republice Czeskiej*

Blossom beetle (*Meligethes aeneus*) is mostly extended pest of winter rapeseed. The occurrence of this pest is regular. Adult beetles fly to rapeseed crops at temperature 12–13ºC. They damaged the buds and decreased the number of siliques per crop. Losts caused by blossom beetle can be very large. The seed yield can be reduced from 25 to 75%, if the insecticide control is not realized. Blossom beetle larvaes can also damage the rapeseed, but these losts are not very significant. Fig. 3. shows the first occurrence of this beetle in Czech Republic since the beginning of the year. Course of this occurrence is correlated with sum of active temperatures (temperatures over 10ºC) for every year (Fig. 5.). It results from these fact, that warm years are more suitable for these pests.

Percentage of insecticide treated area against stem weevils (*Ceutorrhynchus napi and C. quadridens*) correlated to course of total areas under the rapeseed during observed period. (Fig. 2.). First occurrence of these pests is showed in figure 3. Losts caused by these weevils are mostly about 10%, combination of strong infestation with absence of pest control can cause the yield losts till 50%. Literature sources says, that *Ceutorrhynchus napi* start attack the rapeseed crops at temperature over 9^{o}C and *Ceutorrhynchus quadridens* needs temperature from 10 to 12^{o}C. Larvae feeding in stems decreases the seed yield, it causes too early ripening of seeds and it supports the extending of stem diseases. The increase of stem weevils infestation markedly correlates with the increase of rapeseed sowing area.

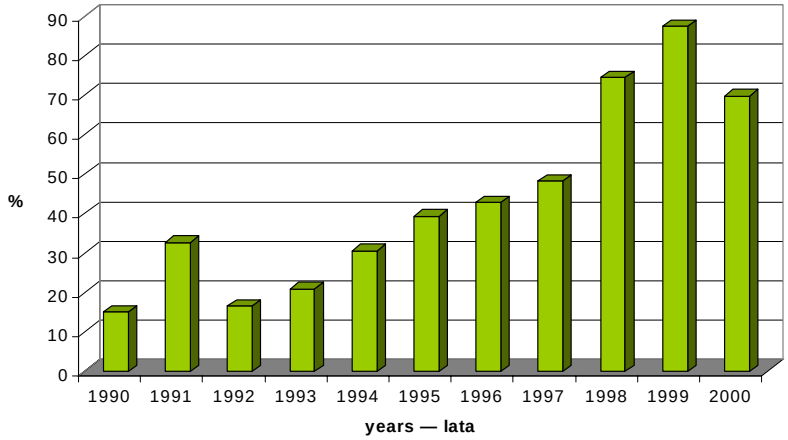

Fig. 2. Percentage of treated area against stem weevils — *Udział procentowy powierzchni uprawy rzepaku chronionej przeciwko szkodnikom łodygowym*

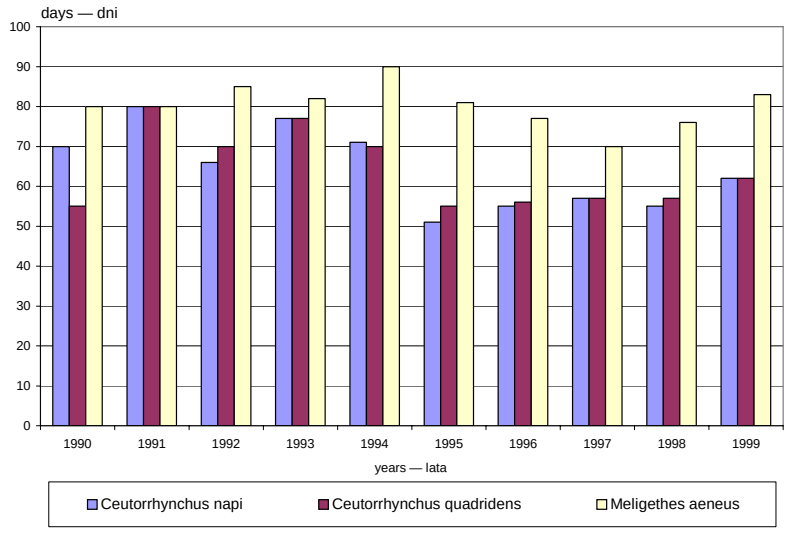

Fig. 3. First occurrence of some rapeseed pests (days since begin of year) — *Pierwszy pojaw niektórych szkodników rzepaku (ilość dni od początku roku)*

The intensity of pest attack by the pod pests (*Ceutorrhynchus assimilis*, *Dasyneura brassicae*) and rapeseed aphids (*Brevicoryne brassicae*) is not so markedly depending on the treated area (Fig. 4.). Larvae of silique pests damage seeds and pod walls, it causes pod cracking and extension of rapeseed pod diseases. Local losts can be till 70%, the losts at center of rapeseed field are approximately

till 10%. It seems, that the occurrence of silique pests is depending on temperature course in years. The attack of these pests is supported by warm and dry wheather at May.

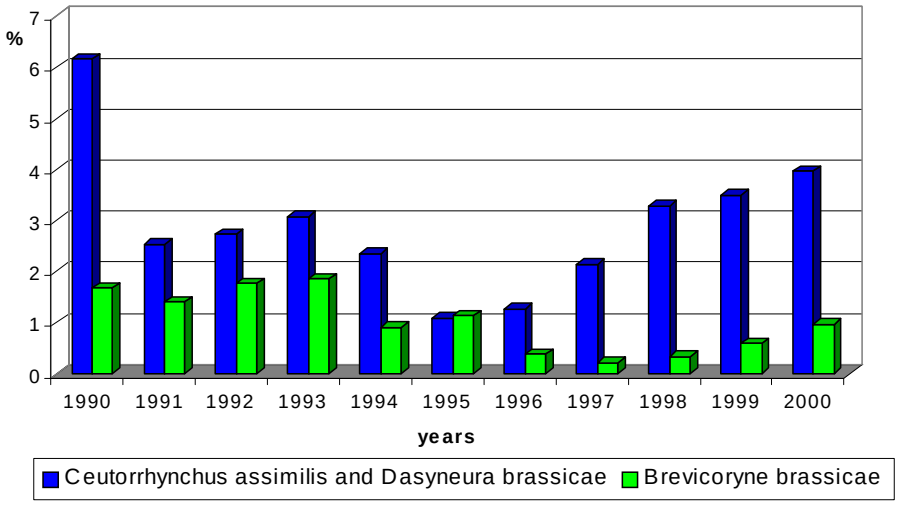

Fig. 4. Percentage of treated area against rapeseed pests — *Udział procentowy powierzchni rzepaku chronionej przeciwko szkodnikom*

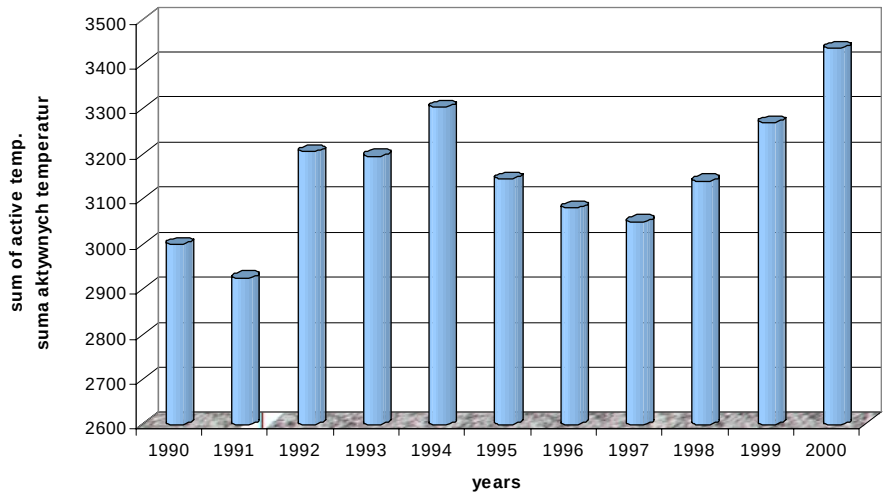

Fig. 5. Sum of active temperatures over 10ºC at observed years — *Suma aktywnych temperatur (powyżej 10ºC) w latach prowadzenia obserwacji*

The percentage of treated area against rapeseed aphids decreased irregularly during the last ten years only (Fig. 4). Plants are damaged by sucking of aphid colonies on stems, these damaged plants are getting fade and dry. Yield losts caused by aphids can extend to 30%. Important pests are also flea beetles (*Psyliodes chrysocephala*), field slugs (*Deroceras reticulata, D. agreste*), weevils (*Ceutorrhynchus pleurostigma*) and sawfly (*Athalia rosae*). The occurrence of these pests is depending on locality and year with focus character of pest attack. Yield losts caused by these pests can be significant. The occurrence of these pest can not be evaluated, while the informations about the occurrence of these pests are not sufficient yet.

Conclusion

Different dependence of individual pests to environmental factors results from the comparation of informations about percentage of treated area, range of sowing area, first occurrence of individual pests and sum of active temperatures over 10ºC. Date of first occurrence of blossom beetle (*Meligethes aeneus*) depended on sum of active temperatures over 10ºC. Blossom beetle is mostly extended rapeseed pest in Czech Republic and the control of this pest is a regular part of growing technology. Therefore the percentage of treated area was not observed for this pest. First occurrence of stem weevils was similar like blossom beetles, the growth of insecticide controlled area against stem weevils correlated to the extension of rapeseed sowing area. Treated area against pod pests (*Ceutorrhynchus assimilis* and *Dasyneura brassicae*) was partially depended on sum of active temperature during several years. Only occurrence of aphids didn’t correlate to any observed indicators.

Wnioski

Zróżnicowana zależność poszczególnych szkodników od czynników środowiska wynikała z porównania informacji na temat procentu chronionych upraw, powierzchni uprawy rzepaku, pierwszego pojawu poszczególnych szkodników i sumy temperatur aktywnych (powyżej 10ºC). Termin pierwszego pojawu słodyszka zależał od sumy temperatur aktywnych. Słodyszek jest najbardziej rozpowszechnionym w Republice Czeskiej szkodnikiem, a ochrona przed nim jest regularną częścią technologii uprawowych. Dlatego nie przeprowadzono obserwacji procentu chronionej przed nim powierzchni.

Pierwszy pojaw chowaczy łodygowych był podobny do pojawu słodyszka. Wzrost powierzchni chronionej insektycydami przed chowaczami łodygowymi

korelował ze wzrostem powierzchni uprawy rzepaku. Powierzchnie chronione przed szkodnikami łuszczynowymi *Ceutorrhynchus assimilis* i *Dasyneura brassicae* były częściowo zależne od sumy temperatur aktywnych w poszczególnych latach. Tylko występowanie mszyc nie korelowało w żadnym z badanych czynników.

Author thank to State Phytosanitary Administration for kindly supply of source materials.