Pests of Winter-sown Oilseed Rape in England

Margaret E. John
ADAS, Cambridge

Summary

The area of oilseed rape grown in Great Britain has increased from 5315 ha in 1971 to approximately 260,000 ha in 1984. Where the crop has been grown intensively, some pests have increased in importance. ADAS (Agricultural Development and Advisory Service of the Ministry of Agriculture, Fisheries and Food) has monitored many of the pests. Their biology has been investigated, their distribution recorded and field trials carried out to determine the timing and effectiveness of pesticides for their control.

Minor pests

On heavy soils slugs are sometimes a problem on the newly emerged crop. Pellets of methiocarb and metaldehyde are used where necessary. Usually however, slugs are a more serious problem in the cereal crops following oilseed rape. Nematodes *(Heterodera cruciferae, Trichodorus* spp and *Meloidogyne artiellia)* are occasionally found associated with areas of poor growth. Root damage by cabbage root fly *(Delia radicum)* occurs mainly on the earlier August sowings with wilting of leaves only obvious under dry conditions ; crops recover after rain and control measures are not recommended. Some of the granules used at drilling (carbofuran, phorate) for cabbage stem flea beetle also give protection against cabbage root fly but are not widely used. Cabbage stem weevil *(Ceuthorrhynchus quadridens)* has not been considered important on the winter-sown oilseed rape crop but damage assessment trials are now in progress. Pollen beetle *(Meligethes* spp), although important on the spring-sown crop, enters the winter-sown crop shortly before flowering. During the susceptible green/yellow bud stage numbers are usually too low to warrant treatment. The threshold for spraying is 15 to 20 beetles per plant but can be reduced to 5 per plant for backward crops. In surveys during 1981 and 1982, 97 % of the 58 crops examined has fewer than one beetle per plant ; numbers in the remaining crops did not exceed 5 per plant. In 1985, pollen beetles entered crops at an earlier growth stage than usual and numbers were greater but no crops seen exceeded the threshold or warranted treatment.

Coffee break between 2 sessions.

Pests, on which ADAS work has been concentrated, include cabbage stem flea beetle *(Psylliodes chrysocephala),* rape winter stem weevil *(Ceuthorrhynchus picitarsis)* and the summer pests, cabbage seed weevil *(C. assimilis)* and brassica pod midge *(Dasyneura brassicae).*

Cabbage stem flea beetle

This pest was a problem on brassica seed crops in parts of East Anglia before rape was extensively grown. Williams and Carden (1961) studied its biology and found gamma-HCH gave good control. For many years this continued to be the only recommended treatment but control was not always adequate ; in part due to incorrectly timed sprays. Carbofuran was found to be the most effective chemical by Alford (1979) but no manufacturers recommendation was issued as broadcasting granules was considered uneconomic.

Between 1981 and 1984 ADAS entomologists have carried out 24 trials on cabbage stem flea beetle control. On the chemicals tested between 1981 and 1983, carbofuran granules broadcast at sowing or in September/October, or cypermethrin sprays applied either in September/October or when larvae were hatching, were found to be the most effective treatments. Cypermethrin consistently reduced larval numbers by at least 70 %, the effect persisting until late spring. Fonofos granules at sowing, or carbaryl or gamma-HCH applied at the time of larval damage were least effective (John and Holliday, 1984). In 1983, cypermethrin and additional synthetic pyrethroids (deltamethrin, fenvalerate) were tested either as single sprays (at the time of adult damage or at larval hatch) or as a two spray programme with applications made at both timings. Single sprays of cypermethrin and deltamethrin reduced larval numbers per plant on average by more than 80 % while two sprays gave a mean reduction of 93 %, the effect persisting into spring. Fenvalerate was slightly less effective (ANON, 1985).

For the 1985/86 season, granules of Yaltox (carbofuran) and sprays of Ambush C (cypermethrin), Decis (deltamethrin), Gamma-Col and Lindane 20 (gamma-HCH) were approved for the control of cabbage stem flea beetle under the Agricultural Chemicals Approval Scheme. Several other pesticides were recommended by manufacturers. Synthetic pyrethroid sprays are now the most widely used insecticides for cabbage stem flea beetle control.

The distribution of cabbage stem flea beetle on oilseed rape in the UK was first recorded by Graham and Alford (1981) who found infestations mainly in Buckinghamshire, Cambridgeshire and Northamptonshire. An ADAS survey of approximately 500 oilseed rape crops in 1981/82 showed that the pest had spread, being most widely distributed in the Eastern, Midland & Western and South Eastern Regions. On 58 % of the crops the pest was not recorded but it had become established in areas which, until that time, were free from the pest. Further recording of local surveys and specimens sent to Plant Clinics for diagnosis showed that *P. chrysocephala* is now widely distributed. In 1985 it can be found on oilseed rape from the east coast to the Welsh borders and from Yorshire to the south coast.

Present ADAS investigations on cabbage stem flea beetle include work on the relationship between visible external petiole damage and larval numbers to enable farmers to assess the necessity for sprays. The benefit from treatments during spring is being investigated and Beet Western Yellow Virus present in trials where automn sprays have been used to control cabbage stem flea beetle is being evaluated. In 1985/86 trials will include autumn treatments to determine the components of yield increase due to control of virus or cabbage stem flea beetle.

Rape winter stem weevil

Serious damage was first reported from Essex and Lincolnshire during 1982. Further infestations have since been recorded but the pest appears to be restricted to Eastern England (ANON, 1985).

Migration of weevil (monitored with water traps) into oilseed rape started in late September/early October in 1983 and 1984. The number of weevils caught was small and was not necessarily related to severity of damage.

Carbofuran granules at drilling or post emergence or synthetic pyrethroids (cypermethrin, deltamethrin) applied in October/November or phorate granules in early November have given good control in trials (ANON, 1985). Routine treatment is not advised but treatment may be justified on farms with a history of damage.

Cabbage seed weevil and brassica pod midge

Each year approximately 70 crops, selected randomly by computer are examined by ADAS entomologists from full flower to assess weevil numbers. In 1985, 53 % of crops have fewer than 0.49 weevils per plant, 22 % had between 0.5 and 0.99 weevils and 25 % over one weevil per plant. In 1983 after a wet May, as eggs and young larvae were found in pods at a late growth stage of the crop, migration into the crop may have been delayed until late flower. A number of crops are not being monitored at regular intervals during flowering to determine more precisely the migration period and to compare assessment methods (visual counts, beating onto trays, sticky and water traps). The proportion of pods found damaged in ADAS surveys and trials for seed weevil (1975-82) was 13 % (range 0-80 %) and for pod midge (1978-82) was 3.4 % (range 0-20 %).

As wheeling damage to the crop has been more accurately quantified at Boxworth and High Mowthorpe Experimental Husbandry Farms (ANON, 1985) the threshold for spraying has been altered. Sprays are considered to be worthwhile if more than 0.5 weevils per plant are found during flowering, if pod midge is also a problem and if mechanical damage to the crop is low.

In the UK the chemicals approved under the Agricultural Chemicals Approved Scheme for control of seed weevil on winter oilseed rape are phosalone (Zolone) and triazophos (Hostathion). Triazophos is dangerous to bees and must not be applied until

flowering has finished and the crop has an overall green appearance ; aerial application is not permitted. Phosalone may be applied by ground machines or from the air between the time when all viable buds are flowering or have flowered on the main raceme and the complete end of flowering (GS 9). Both chemicals have a penetrant action and kill the young larvae within the pods. They are most effective when used near to or at the end of flowering. Synthetic pyrethroids which have a limited clearance for use on oilseed rape during the summer, act as contact insecticides and must be applied before egg hatch. They appear to cause little or no bee mortality when applied at the field dose rates used.

The efficiency of synthetic pyrethroids was compared with phosalone and triazophos in 1983 and 1984 ; on small plots (8 trials) in 1983 and on 1 ha plots to minimize the effect of pest movement in 1984 (14 trials). Generally pyrethroids applied at the end of flowering of the main raceme gave reasonable control of seed weevil and pod midge but when applied earlier were often ineffective. Phosalone applied at the end of flowering in 1983 gave good control, confirming the results of previous ADAS trials. An experimental flowable formulation of phosalone was disappointing in 1984 when applied at the end of flowering of the main raceme ; this timing was sometimes more than 3 weeks before the end of flowering. Triazophos in both years gave the best control (ANON, 1985).

Trials are continuing on the timing of synthetic pyrethroid sprays for the control of seed weevil and pod midge.

References

ANON, 1985. Booklet 2285 (85) Oilseed rape ; recent ADAS experimental work 1985.

ALFORD, D.V. (1977). Chemical control of the cabbage stem flea beetle, *Psylliodes chrysocephala,* on winter oilseed rape. Annals of Applied Biology 85, 369-374.

JOHN, M.E. and HOLLIDAY, J.M. (1984). Distribution and chemical control of *Psylliodes chrysocephala* and *Ceuthorrhynchus picitarsis* in winter oilseed rape. Aspects of Applied Biology 6. 1984 Agronomy, physiology, plant breeding and crop protection of oilseed rape 281-292.

WILLIAMS, J.J.W. and CARDEN, P.W. (1961). Cabbage stem flea beetle in East Anglia Plant Pathology 10, 85-95.