APPLICATION LEAFLET ON THE USE OF 'PERMIT' AND 'PERMASECT 25 EC' FOR PRE-PLANTING TREATMENT OF YOUNG TREES AGAINST HYLOBIUS ABIETIS AND HYLASTES SPP., by J.T. Stoakley and S.G. Heritage

Summary

This Note describes the use of two formulations of permethrin, 'Permit' (PBI) and 'Permasect 25 EC' (Mitchell Cotts) as pre-planting treatments to provide protection of young planting stock — either bare-rooted or raised in containers — against Hylobius abietis and Hylastes spp. which are frequently destructive on felled conifer sites. It takes the form of an 'Application Leaflet', which is a mandatory adjunct to the formal Approval given by the Pesticides Safety Division of MAFF for the described uses under the Control of Pesticides Regulations 1986. The need for specified protective clothing and detailed attention to safety procedures is emphasised throughout. The use of these treatments in the context of the COSHH Regulations, which now apply, is explained. The Approvals to which this publication refers expire on 6 February 1991.

Introduction

1. This Note should be read in conjunction with Research Information Note 140.

2. The use of specified formulations of the insecticide permethrin is currently Approved, under the control of Pesticides Regulations 1986, for pre-planting treatment of bare-rooted plants and of plants raised in containers, which are intended for restocking felled conifer sites. Approval for the use of formulations of lindane for this purpose has been applied for but not granted by the date of this publication.

3. Two products formulated from permethrin, 'Permit', manufactured by Pan Britannica Industries and 'Permasect 25 EC', manufactured by Mitchell Cotts, have received provisional, off-label Approval for use as pre-planting treatments on transplants for forest use. The relevant documents, issued by the Pesticides Safety Division of MAFF, are number 0126/90 for 'Permasect 25 EC' and number 0127/90 for 'Permit', both dated 7 February 1990. The conditions, which are statutory, supersede any on the label which would otherwise apply. These Approvals are each valid until 6 February 1991. After this date the Forestry Commission should be consulted about possible renewal of the Approvals.

Conditions and requirements

4. The Approvals for the uses of the permethrin products include the following specific conditions:

   a. this Application Leaflet must be read and understood prior to use of either product to treat forestry planting stock before planting;

   b. supervisors must notify names and locations of dipping sites to Pesticides Safety Division, MAFF, Hatching Green, Harpenden, Herts AL5 2BD, before the start of operations.

5. It is a general requirement under the Control of Pesticides Regulations 1986 that all personnel involved are sufficiently trained and competent in the use of pesticides. Application of insecticides and all subsequent handling of treated plants should be under the direct supervision of a trained Forestry Commission staff member, or, in the case of private operations or contractors, an equally qualified person. Under the Control of Substances Hazardous to Health (COSHH) Regulations 1988 equipment must be designed, and work systems organised, so as to minimise exposure to dipping solutions. Following the principles of the COSHH Regulations these methods, described as 'engineering control of exposure', are presented by the regulatory authorities, and are to be seen by users, as the first line of protection to be effected wherever practicable. The use of protective clothing is either a secondary measure or a last
resort. The Forestry Commission has, for some time, been working actively to meet these requirements, as far as its own personnel are concerned, although it is not expected that they can be fully met in the current planting season. However, it must now be made clear to all Forestry Commission and Private Forestry staff that the COSHH Regulations have introduced a significant change of philosophy regarding the safe use of pesticides. Under earlier Approvals it may have appeared that managers and supervisors would have fully discharged their duty by strictly following the conditions laid down. This is no longer the case. The onus is on them individually to take all practical steps to avoid exposure of their personnel to pesticides and to be able to justify the actions they have taken. The following details should be read with this in mind.

6. The Approvals provide for the use of 'Permit' and 'Permasect 25 EC' other than on the product labels. Such 'off-label' use is at all times done at the user's choosing, and the commercial risk is entirely his or hers.

Use of 'Permit' and 'Permasect 25 EC'

7. 'Permit' contains 20% weight/volume of permethrin; 'Permasect 25 EC' contains 25% weight/volume of permethrin. It follows that they must be diluted at different rates in order to give solutions of the same strength.

8. a. For bare-rooted plants a 0.8% solution of either product may be applied to the shoots and upper root systems by dipping. Recommendations for mixing either product to this concentration in dipping tanks and detailed procedures for safe treatment and handling of treated plants are given below.

b. Intending users should be aware that these treatments have only been tested for phytotoxic effects on a very limited range of commonly used conifers. In normal circumstances no serious effects are anticipated on these or other species but the Forestry Commission gives no guarantee that the treatments will be without such effects.

9. a. For plants raised in containers a 0.8% solution of either product may be applied, pre-planting, to hardened-off seedlings as an overall spray to run-off. Details are given below.

b. Intending users should be aware that the Forestry Commission's experience of these treatments has been limited to Corsican pine raised in Japanese paper pots (JPPs). It has no experience with the use of these treatments on plants raised in other container systems and gives no guarantee that any use will be without phytotoxic effects.

TREATMENT OF BARE-ROOTED STOCK BY DIPPING

Mixing and maintaining a 0.8% solution of permethrin

10. Mixing

a. 'Permit' should be diluted at the rate of 1 litre of the product to 24 litres of water to make up 25 litres of a 0.8% solution, and pro rata according to the size of the dipping tank.

b. 'Permasect 25 EC' should be diluted at the rate of 1 litre of the product to 30.25 litres of water to make up a 0.8% solution, and pro rata.

c. Solutions of permethrin in dipping tanks should be stirred thoroughly at the beginning of each day, after rest periods and at intervals while work is in progress and especially after breaks in use.

11. Maintaining the dipping solution

a. 'Permit' and 'Permasect' are both emulsifiable concentrate (EC) formulations. They can be poured readily from containers (unlike 'Gamma-Col' and 'Lindane Flowable') and it is a characteristic of such formulations that they mix readily with water. Also, as they are EC formulations there is no loss of concentration of dipping solutions related to through-put of plants (as is the case for the suspension concentrate formulations of lindane mentioned above) but there will be loss of volume with usage, which can be simply corrected, if necessary, by adding more solution made up as described in paragraph 9.a. or 9.b.

b. When, under previous Approvals, plants were dipped in diluted 'Gamma-Col' or 'Lindane Flowable', which are suspension concentrates, much active ingredient was readily carried down with soil washed from the plant roots and accumulated as a sludge in the tank. This is not such a serious problem when using EC formulations, which mix easily with water. Nevertheless this soil will be contaminated and when stirring and dipping becomes impractical all of the tank contents should be transferred into sound, clearly marked, containers for safe disposal and a fresh solution made up.
Dipping procedure

12. a. The following procedure applies when plants are to be dipped in a solution of permethrin made up from 'Permit' or 'Permasect 25 EC'.

b. The protective clothing prescribed for workers involved in dipping is given in paragraph 15.a. below. In this connection dipping is considered to include all operations from the making up of suspensions and preparation of plants immediately prior to dipping, up to and including the sheughing ('heeling-in') of wet plants.

c. The process of dipping is exceptional amongst forest operations in placing workers at risk of prolonged contact with insecticides. Very high standards of practice and personal hygiene are therefore essential. Speed of work must be carefully regulated to ensure safety.

d. Immediately prior to dipping, plants should be grouped into loose bundles of a size convenient for handling. Plants with inter-twined roots must have been fully separated prior to dipping. Culling and any grading of plants must have been done before dipping.

e. Loose bundles of plants should be inverted and the shoots and the uppermost part of the root systems immersed in the dipping solution for 5 seconds to ensure adequate penetration and wetting.

f. After dipping, the loosened bundles should be laid on racks for a short period to allow surplus liquid to drain off and to minimise the contamination of fine roots with insecticides.

g. The drainage racks must be sufficiently low to ensure that workers do not have to lift bundles of plants above the level of their elbows. This is to ensure that dip solution on the gloves of workers handling the wet bundles runs down to the fingertips, not towards the elbows. Otherwise insecticide will seep round the openings of gloves and contaminate the inside.

h. After draining, the plants, still in loosened bundles, should be sheughed ('heelied-in') to allow tops to dry off as soon as possible. Where large numbers of plants have to be dipped, a roofed area with free ventilation from all sides should be used for this purpose.

It is essential that insecticide solutions dry on to plant surfaces to ensure weather fastness.

i. Plants should not be put into cold storage after dipping.

Packing procedure

13. Once the insecticide has dried, plants may be packed into polythene bags for transport. Where possible, these bags should be of a suitable size for subsequent placing directly into the planting bag. However, they must be big enough to be tied and the plants fully enclosed. Plants should not be put into polythene bags when wet with rain or dew.

TREATMENT OF SEEDLING RAISED IN CONTAINERS

Pre-planting spray procedure

14. a. The same procedure should be followed whether plants are to be sprayed with a permethrin solution made up from 'Permit' or 'Permasect 25 EC'. For recommended protective clothing, see paragraph 16.

b. A 0.8% solution should be made up (see paragraph 9).

c. Sprays should be applied to run-off using a conventional knapsack sprayer or other spraying system and lance with a conic nozzle giving coarse droplets and working at 10 lb psi (0.7 bar) pressure.

SAFETY CONSIDERATIONS

Protective clothing to be used

15. The protective clothing to be worn varies according to the task to be performed — dipping, spraying plants in containers, or handling chemically treated plants and planting. This is detailed below for circumstances in which there are no effective engineering controls. However, it should be noted that engineering controls may replace items of personal protective equipment if a COSHH assessment shows that they would provide an equal or higher standard of protection.

16. Dipping

a. The following items of protective clothing must be worn when dipping;

i. face shield and suitable respirator. The latter should be to a standard not less than BS6016;
ii. one-piece coverall with hood of neoprene or similar material;

iii. rubber apron;

iv. elbow-length, chemical-proof gloves, worn outside the sleeves of the protective suit;

v. wellington boots.

b. Clean gloves must be put on at the start of each work period.

c. Care must be taken to minimise contamination of skin when taking off protective clothing prior to meals, attending to personal needs and at the end of the working day. Care must also be taken to avoid contamination of other workers and of plant packaging by protective clothing which has been used at the dipping tank.

d. On no account should workers who have been engaged on dipping move on to packing unless they have carefully removed their protective clothing worn for dipping, as prescribed at the end of a work period, and have put on the appropriate clean protective clothing for packing.

e. Protective clothing used when dipping should be kept separate from other clothing.

17. Pre-planting spraying of plants in containers

In general the same protective clothing and equipment must be worn as for dipping and the same procedures followed.

18. Handling chemically treated plants and planting

a. These operations include:

i. packing treated bare-rooted plants into polythene bags;

ii. removal of treated bare-rooted plants from polythene bags;

iii. handling trays of seedlings in containers and removal of containers from trays;

iv. planting bare-rooted plants or seedlings raised in containers.

b. The following protective clothing must be worn:

i. either a chemical-proof bib and brace overall, of neoprene or similar material and elasticated elbow length plastic sleeves;

or a chemical-proof two-piece suit of neoprene or similar material;

(in the first case a quarter length jacket may also be worn as protection from the weather);

ii. wrist-length chemical-proof gloves, with cuffs inside the elasticated sleevelets or jacket sleeves.

c. Clean gloves and sleevelets must be put on when required at the start of each work period.

d. Exceptionally, treated plants wet with dew or rain may have to be packed into polythene bags, short term, for transport to the planting site although this is not recommended as a general practice. In this case protective clothing to the same specification as for dipping should be worn.

Care of protective clothing — all operations

19. a. If gloves become damaged during use they must be discarded, hands washed and new gloves put on.

b. When gloves and sleevelets have to be taken off, their outsides must be washed and surplus moisture wiped off before removal.

c. At the end of each work period the outside of all protective clothing should be carefully washed down and surplus moisture wiped off.

d. Protective clothing, such as gloves and plastic sleevelets, which become difficult to clean effectively should be replaced.

e. Protective clothing must be put on, taken off and stored, away from rest and refreshment facilities. Ventilated accommodation must be provided for protective clothing with separate facilities for storage of contaminated and clean clothing. Cross-contamination of protective clothing and contamination of personal clothes must be avoided.
Avoiding contamination

20. Dipping

Workers dipping plants must be alert to the need to prevent dip solution working on to the inside of protective clothing, especially gloves, and the need to clean clothing thoroughly whenever this is thought to have occurred. Prevention of contact with insecticide entails strict attention to good work practice at all times. Observance of this recommendation will ensure that the effect of any minor contamination is minimised.

21. Plant handling

a. It has to be recognised that traces of insecticide deposited on plants are removed whenever a plant is handled. A worker handling a large number of plants over a short period will accumulate a deposit of dry insecticide, especially on his gloves, which may then be transferred by contact to any exposed skin on the face and neck. Insecticide can also penetrate small holes in gloves and the join between gloves and other garments. While protective clothing minimises exposure to pesticides, it cannot eliminate it entirely. Therefore the use of protective clothing has to be combined with good routine personal hygiene and, in particular, washing of hands before eating, smoking or attending to personal needs. Routines for removal of protective clothing must be observed.

b. NOTE. It is a specific requirement of the Approvals that before planting, bags containing treated plants must be opened and ventilated for at least one hour in the open air.

Surveillance

22. It is a specific condition of the Approvals that appropriate programmes of health surveillance must be carried out under COSHH and a report of all incidents be submitted within 6 weeks of the end of planting.

Restricted work periods

23. It is also a specific condition that operators must not work more than 80 hours in any two week period and any period of between 40-80 hours spent by an operator continuously dipping must be followed by a similar period engaged in work not involving permethrin.

Safe disposal of insecticide residues

24. Surplus insecticide solution remaining after dipping must be disposed of safely by a method acceptable to the Regional Water Authority, or in Scotland, to the appropriate agencies. Permethrin is EXTREMELY DANGEROUS to fish and must on no account be discharged into watercourses, directly or indirectly. If the surplus cannot be disposed of safely by spraying over dry waste ground, where it will be absorbed, the liquid should be stored in secure containers pending removal by a firm specialising in safe disposal of pesticide wastes. Sludge from the bottom of dipping tanks should be disposed of similarly. It is recommended that insecticide solution and sludge should not be spread on out-of-use nursery beds.

Records

25. Records of dipping, spraying and planting operations should be kept, as recommended in the Provisional code of practice for the use of pesticides in forestry (Forestry Commission Occasional Paper 21 available from the address below, priced £2 + 40p P&P). These should include notes of hours worked and numbers of plants treated, handled or planted as appropriate.

Further information

26. Further relevant information on safe working methods and the use of protective clothing will be given in the following Safety Guides issued by the Forestry Safety Council:

Dipping Plants in Insecticide

Pre-planting Spraying of Containerised Seedlings

Planting (including Plants Treated with Insecticide)

These should be studied by all involved.

Expiry of approval

27. The Approvals issued under the Control of Pesticides Regulations 1986, to which this Application Leaflet relates, expire on 6 February 1991.