CHEMICAL CONTROL OF ZETHENIA RUFESCENTARIA
MOTSCH

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ABSTRACT Zethenia rufescentaria Motsch. has outbroken successively in the larch plantation of Jixi region and seriously damaged stands since 1990. Chemical control was studied for controlling the occurrence of the pest. The results showed as follows: When the third or the forth instar larvae was controlled with smoke agent of 5% Lindane, the most suitable time was July 10-13. The area controlled was 2000 hm². The dosage was 7.5 kg/hm² and the mortality of the pest reached 93.5%. 25% dimilin III (flowable formulation) was used to prevent the third instar larvae. The best time was about July 5. The dosage was 150g/hm². The mortality of the pest reached 89.85%. 3% Hexyclan dusting was also used to control adults of the pest. The best time was before the peak of their emergence (June 3), the dosage was 11.3 kg/hm². The mortality of the pests reached 89.6%.

Key words: Zethenia rufescentaria Motsch; Chemical control; Occurrence regularity

Zethenia rufescentaria Motsch is one of the main pests in larch man-made forest, which damages 19-35 years old trees. This pest has outbroken successively in Jixi since 1990. The pest density is up to 1300 head/tree in the badly damaged stands. The needles of larch almost was eaten out by this pest. The normal growth of man-made forest was badly influenced. So the occurrence regularity of the pest was observed detailedly in 1990. On the base of this observance, the best time and methods for controlling pest were found. 3rd to 4th instar larva with smoke agent was controlled in a widespread area in 1991. A spraying test against 3rd larvae was made in a small area in 1992. At the same time, dusting test against adult just emerged from the cocoon was conducted in small area in 1991. The results above were got satisfactorily.

METHODS

Insecticides 5% Lindane smoke agent was produced by Pingshan Insecticide Factory in Heilongjiang Province. 5% dimilin III in flowable formulation was produced by Tonghua Insecticide factory in Jilin Province. 3% lindane dust agent was produced by Pingshan Insecticide Factory in Heilongjiang Province.

Control to Larvae with Smoke Agent
The area of Z. rufescentaria damaging was large, scattering, almost mountainous region, and intersect with residents in Jixi. Smoke agent control is the best way because airplane spraying control is not accessible. It was investigated that adults age, larvae dentistry, damaged area, and dosage used before smoke agent was used. The first test was conducted on a small area. Then the test was on the large area. Because control stands were almost on the main ridge of the mountain, the smoke-points were set up every 5-7 m intervals. When the steep length was over 300 m, supplementary smoke-point should be put up every 10-15 m intervals. This work should be
finished during the day. After the sun was down, and atmosphere revered increasing, the smoke agent should be ignited one by one and the time of the smoke and time of smoke staying in the forest was observed.

Control To Larvae with Normal Quantity Spraying Agent The characteristic stands with high density of larvae and young age trees were selected as test field of spraying. 3rd instar larvae was controlled with 25% dimuln III in normal quantity. A contrast plot was taken in similar stands with water.

Control to Adults with Dusting The distribution condition of pupae should be investigated. In the stands with high density of pupae, the area of 13.3 hm² was selected as the test plot. Before the peak of adult’s emergence (June 3), adult was prevented with 3% Lindane dust-agent. Contrast plot was set in similar stands.

Inspection Methods The control results of smoke agent were analyzed by three statistical methods such as sampling tree, sampling branch and caging. According the method of sampling tree. 50 standard trees were selected and plastic cloth was put under the trees before control. The larvae in these trees were stacked down 1-1.5 h after the control and were put into cages and hung up on the trees. The death result of larvae was observed after 72 h. The sampling branch method is similar to the sampling stand method. The difference is only that sampling branches was regarded as unity. The caging method is that the larvae were put into the cages which were hung up on the trees before control. The death results of larva were observed in three levels of tree height such as above, middle and low after 72 h control.

Control results of spraying agent were statistical and analyzed by sampling branch method. The larvae began to die in 6th days and the death investigation continued until 18 days after the control.

The investigation control result of dusting was a unity as sample plots. The number of died and living adults just emerged and the peak times of emergence of Z. Rufescentaria were investigated.

The Occurrence Regularity and the Best Time of Preventing of Z. Rufescentaria The pupae of this pest overwintered under litter or inside 1-2 cm depth soil in Jixi. The adults begin to emerge in mid May next year and have a peak emergence in early June. Most adults stay on weeds in the forest and fly on the height of 2-3 m above the ground when shocked. Adult is phototropism. The mating happens within 1-2 days after emerging. The eggs lay on the needles, bark seams and twigs singly. The average egg stage is 10.2 days. Larvae begin to hatch in last May. The peak of hatching is in mid June and finishes in early July. The first instar larvae have the characters of eating eggs, spiting silk to drop down when shocked and disburssing with wind; and they have strong characteristic of enduring hungry. Larvae ages are add up to 6 instars, the first and 2nd instar larvae usually eat the new needles below the crown. 3rd instar larvae damage the crown and matured larvae enter into litter or soil. The pupae overwinters in early August.

According to the occurrence characteristic of Z. Rufescentaria, the best time preventing 3-4th instar larvae with smoke agent should be between July 10 and July 13 when all the larvae hatched and damaged the forest crown. The best time against 3rd instar larva with spraying agent was about July 5 when most of the larvae hatched. The best time that the adult was controlled with dust agent was June 3 before the adults got out from the earth.

RESULTS

Control Result by 5% Lindana Smoke-Agent In Datong Forest Farm of Jixi City, from July 15 - 17 in 1991, the larvae of Z. Rufescentaria were controlled with 5% Lindane (7.5 kg/hm²) in 2000 hm² 30-year-old larch stands. The weather was sunny. The average temperature was 24°C and southwest wind was 1.0 m/s within the stands.