FOREST PROTECTION AND LANDSCAPING

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REGISTRATION TESTS OF INSECTICIDE VIRIY, CS ON FOREST STENDS PESTS

Insecticide viriy, CS (tiakloprid, 245 g/l, distributorship is SLL "Frandesa", Belarus) from the group of neonicotinoides was tested on the pests of forest stands. The insecticide aktara, WSG, competent on the forest stands, was an etalon. The tests of viriy, CS against suctorial pests – *Aradus cinnamomeus* Panz. with rate of application at 0.6 l/ha have provided for almost 90% biological effectiveness on seventh day, against *Cinara pinea* Mord. and other aphides with rate of application at 0.3 and 0.4 l/ha – about 100%. Viriy, CS with rate of application at 0.5 l/ha have showed efficacy against weevil beetles up-to-date of 94.4%, with rate of application at 0.4 l/ha – 88.9%. It is higher than etalon aktara, WSG.

On the deciduous trees application of viriy, CS against alder leaf-eating larvae has given a high performance with rate of application at 0.5 l/ha (death-rate on seventh day was 97.9%), and with rate of application at 0.4 l/ha the efficacy was closely related to etalon aktara, WSG with the same rate of application. Trials with viriy, CS against aphides on birch with rate of application at 0.3 and 0.4 l/ha supplied with biological effectiveness of insecticide practically up-to-date of 100%. As a result of trials insecticide viriy, CS was registered for adaptation in forest stands against pests.

Key words: suctorial and gnaw pests, forest stands, insecticide, rate of application, biological effectiveness.

Introduction. Protective measures against insects-phytophages are an integral part of the general technology of creation of forest cultures and their further cultivation. Therefore selection and tests of new insecticides against pests of forest cultures, their inclusion in the State register of pesticides authorized for usage, have a great value at protective measures systems development. Modern pesticides belonging to the group of neonicotinoides are from such insecticides. It is necessary to note that in SFI, which are passing and passed certification of forest management and forest utilization according to standards of Forest board of guardians (FSC), according to its pesticides policy, the whole groups of pesticides are forbidden for usage, for example, synthetic pyrethroides, included in the State registry and having the state registration, including the authorized ones against the forest cultures pests. Neonicotinoides are not forbidden for usage in the certification system of FSC. During the last three years the list of pesticides for usage in the forest cultures not contradicting the policy of FSC extended. Now it includes 19 insecticides, 18 fungicides and 11 biological preparations [1]. It in 1.5 times more than the authorized ones by the previous State registry [2]. Besides employees of the department of forest protection and wood science took part in tests and registration of 10 pesticides [3].

Main part. Modern pesticides screening to widen the assortment of perspective insecticides for registration on forest cultures was made in 2014. Insecticide viriy CS (tiakloprid, 245 g/l) was chosen for tests from the group of neonicotinoides of the firm SLL "Frandesa" (Belarus), and the working program of tests and the field experiments pattern were coordinated and confirmed with this firm. This insecticide was registered earlier on agricultural cultures and its application against forest cultures pests does not contradict the pesticides policy of the Forest board of guardians (FSC). Recording of pest number and assessment of biological efficiency were made according to Methodical instructions on registration tests of insecticides, acaricides, molluscocides, rodenticides and pheromones [4].

Insecticide viriy, CS was tested by us in cultures of pine, birch and alder against two pest groups: suctorial (pine buck bug, greenfly) and gnawing (imago of billbug, larva of leaf-cutting beetle). Insecticide aktara, WSG, was chosen as the standard, it is authorized for usage on forest cultures.

Viriy, CS tests against pine buck bug (*Aradus cinnamomeus* Panz.), conducting a hidden mode of life [5], with the rate of application of 0.6 l/ha provided

practically 90% efficiency on the seventh day. The result is higher than that of the insecticide used as the standard – aktara, WSG, recommended for use on forest cultures. Viriy, CS efficiency is rather high (78.7%) at the rate of application of 0.5 l/ha (Table 1).

Viriy, CS test results against brown pine (*Cinara pinea* Mord.) and other greenflies showed that at the rate of application of 0.3 and 0.4 l/ha biological efficiency is practically 100% (Table 2).

The biological efficiency assessment of insecticide viriy, CS was made on pine also against gnawing pests – beetles of pine billbug (pollinated billbug) – *Brachideres incanus* L. and other billbugs (Table 3).

Viriy, CS with the rate of application of 0.5 l/ha provided biological efficiency against beetles of billbugs at the level of 94.4%, with the rate of application of 0.4 l/ha – 88.9%, and that is essentially higher than with aktara, WSG (81.2%).

The preparation viriy, CS was tested against suctorial and gnawing pests on deciduous species (Table 4, 5).

Table 1

Biological efficiency of viriy, CS against pine buck bug

Variant	Average number, pieces/dm^2			Biological efficiency, %	
	before treatment	after treatment		on 3^d day	on 7th day
		on 3^d day	on 7th day		
Control (without insecticide application)	0.61	0.54	0.57	–	–
Aktara, WSG (standard), 0.4 l/ha	0.82	0.53	0.51	35.2	38.3
Viriy, CS 0.6 l/ha	1.04	0.17	0.11	84.0	89.6
Viriy, CS 0.5 l/ha	0.35	0.10	0.07	72.4	78.7
Viriy, CS 0.3 l/ha	0.52	0.24	0.21	53.8	59.3

Table 2

Biological efficiency of viriy, CS against greenfly in pine cultures

Variant	Average number on 1 m of shoots, pieces			Biological efficiency, %	
	before treatment	after treatment		on 3^d day	on 7th day
		on 3^d day	on 7th day		
Control (without insecticide application)	62.1	65.3	68.0	–	–
Aktara, WSG (standard), 0.4 l/ha	56.5	3.8	1.1	93.3	98.1
Viriy, CS 0.4 l/ha	72.3	1.2	0	98.4	100.0
Viriy, CS 0.3 l/ha	60.2	1.8	0.4	97.0	99.3
Viriy, CS 0.2 l/ha	58.0	12.4	6.7	79.7	88.6

Table 3

Biological efficiency of viriy, CS against beetles of billbugs

Variant	Average number, pieces/20 trees			Biological efficiency, %	
	before treatment	after treatment		on 3^d day	on 7th day
		on 3^d day	on 7th day		
Control (without insecticide application)	28	26	25	–	–
Aktara, WSG (standard), 0.4 l/ha	32	8	6	75.0	81.2
Viriy, CS 0.5 l/ha	36	3	2	91.7	94.4
Viriy, CS 0.4 l/ha	27	4	3	85.2	88.9
Viriy, CS 0.3 l/ha	21	6	4	71.4	81.0

Table 4

Biological efficiency of viriy, CS against larva of alder leaf-cutting beetle

Variant	Average number, pieces/10 trees			Biological efficiency, %	
	before treatment	after treatment		on 3^d day	on 7th day
		on 3^d day	on 7th day		
Control (without insecticide application)	59	58	56	–	–
Aktara, WSG (standard), 0.4 l/ha	42	7	4	83.3	90.5
Viriy, CS 0.5 l/ha	48	3	1	93.7	97.9
Viriy, CS 0.4 l/ha	56	10	8	82.1	85.7
Viriy, CS 0.3 l/ha	51	12	11	76.5	78.4

Table 5

Biological efficiency of viriy, CS against greenfly on birch

Variant	Average number on 2 m of branches, pieces			Biological efficiency, %	
	before treatment	after treatment		on 3^{d} day	on 7th day
		on 3^{d} day	on 7th day		
Control (without insecticide application)	52.1	50.2	52.4	–	–
Aktara, WSG (standard), 0.4 l/ha	46.5	4.0	1.9	91.4	96.0
Viriy, CS 0.4 l/ha	48.9	0	0	100.0	100.0
Viriy, CS 0.3 l/ha	50.2	3.2	1.0	93.6	98.0
Viriy, CS 0.2 l/ha	42.4	9.9	5.3	76.7	87.4

Usage of viriy, CS against larva of alder leaf-cutting beetle showed its high efficiency with the rate of application of 0.5 l/ha (death rate on the seventh day is 97.9%). Viriy, CS with the rate of application of 0.4 l/ha had efficiency close to the standard aktara, WSG with the same the rate of application (85.7 and 90.5% accordingly). Test results of viriy, CS against greenfly on birch showed that at the rate of application of 0.3 and 0.4 l/ha biological efficiency of the insecticide is practically 100%.

Conclusion. According to the test results the preparation viriy, CS is registered in 2014 in the State register for usage on forest cultures against suctorial and gnawing pests [6].

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