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THE USE OF NEGUVON FOR CONTROL OF GRUBS IN ANGORA GOATS

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Summary: Neguvon was used in a field trial against grubs on 736 Angora goats. It was washed on the skin or given by oral route.

A single wash with Neguvon as 2 % solution in the middle of November, December or January resulted in the decrease of 64. 07 %, 92. 41% and 98.60 % of grub infestation respectively.

Oral treatment was applied to animals once, twice and thrice at an interval of 1 month, starting at the beginning of September or October. 50 mg of Neguvon as 10 % solution was used per kilogram of body weight. In September groups, grub reduction was 66.54 % with single treatment, 57.84 % with two treatments and 92.56 % with three treatments. In October groups, it was 57.02 % with single treatment, 91.72 % with two treatments and 96. 71 % with three treatments.

Single oral treatment with Neguvon at a rate of 75 mg per kilogram of body weight in October, November and December resulted in 48.90 %, 82.23 % and 69.94 % grub reductions respectively.

Neguvon'un Keçi Hypodermosis'i üzerine etkisi

Özet: Bu çalışma 1 veya 2 mevsim meraya çıkmış 736 Ankara keçisi üzerinde yapılmıştır. Neguvon bazı hayvanlara ağızdan verilmiş, diğer bazılarına haricen tatbik edilmiştir. Ağızdan verilenlere tek doz veya birer ay arayla 2 ya da 3 doz halinde uygulanmıştır. Neguvon'un 50 ila 75 mg/Kg dozları, % 10 luk solusyon şeklinde, hayvanlara içirilmiştir. Haricen tatbik edilenlerde, Neguvon'un % 2 lik solusyonu ile hayvanların sırt bölgesi yıkanmıştır. İlaçlama zamanı, larvaların hayvan organizmasındaki göç durumuna göre tayin edilmiştir.

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Eylül'de başlayıp ağız yoluyla hayvanlara 1 defa Neguvon (50 mg/Kg) verildiği zaman % 66. 54, birer ay arayla 2 defa verildiği zaman % 57. 84, 3 defa verildiği zaman % 92. 56 oranında bir etki meydana gelmiştir. İlaçlamaya Ekim ayında başlandığı taktirde etki nisbetleri sırasiyle % 57, 02, % 91. 72 ve 96.71 olmuştur. Neguvon'un dozu artırıldığı zaman (75 mg/Kg), 1 defa ilaçlamak suretiyle, Ekim tedavisinde % 48.90, Kasım tedavisinde % 82.23 ve Aralık tedavisinde % 69.94 oranında bir etki görülmüştür.

% 2 lik Neguvon solusyoniyle haricen tedavi edilen hayvanlardan, Kasım'da 1 defa yıkananlarda % 64.07, Aralık'da 1 defa yıkananlarda % 92.41 ve Ocak'da 1 defa yıkananlarda % 98. 60 nisbetinde etki tesbit edilmiştir.

Introduction

The population of Angora goats is nearly six millions in Turkey. They are mostly bred for mohair and meat, and have been a great source of income for the economy of the country.

Parasitic diseases of Angora goats show a wide and large scale distribution [6]. They have a harmful effect on the development of young animals and reduce their productivity. Among the parasitic diseases, the warble fly (Przhevalskiana silenus) invasion appears to be very prevalent [7, 10, 13, 14, 25]. It is particularly spread in the dry and hilly parts of the country. Certain herds in some provinces (Ankara, Eskişehir and Yozgat) of Central Anatolia are found to be infested to an extent of more than 95 percent, and in a number of cases 40 to 45 larvae have been recorded from a single animal [7, 10, 13, 25]. At present no measure has been taken to control this widely distributed parasite.

In the control of cattle grub, Neguvon has been used, on a large scale, in spray or washing of 2 % aquous solution and it has a strong effect both on subcutaneous grub and the migrating larvae [3, 9, 11, 12, 15 19, 20, 21, 22, 23, 26, 27]. Subcutaneous injection [5] or oral administration [1, 2, 4, 8, 9, 17, 18] of the preparation also give satisfactory results in the reduction of grubs of infested animals. The safety of Neguvon for cattle is confirmed either when used by dermal application [1, 12, 15, 22, 23] and subcutaneous injection [5] or by oral route [18, 19] although some undesirable side effects were observed after oral administration [9].

The appraisal of Neguvon in the control of goat grub infestation is not so far known, althogh a limited number of preliminary reports indicate its sufficient effect to destroy this parasite [14, 16].

This study is concerned with the effect of Neguvon on the control of Angora goat grubs during the years of 1971 and 1972 in Central Anatolia.

Materials and Methods

This study was carried out in the areas of Eskişehir and Ankara where Angora goat population shows a high density and the warble fly invasion appears to be very prevalent. The animals were enlisted for the test in Çifteler and Lalahan Animal Breeding Farms. Only the goats which had had one to two pasture periods, were included in the tests, because we know from experience that such animals have maximum goat grub infestation. The selected animals were separated into groups. Separation was made in such a manner that all groups were approximately equal in size and they were comparable as regards to age of the animals, number of pasture periods and expected goat grub infestation in Spring. A total of 736 goats were treated, of which 530 recieved Neguvon orally at the rates of 50 mg and 75 mg per kilogram of body weight, 200 were subjected to back washing with 2 % aquous solution of Neguvon. Success of treatment was evaluated by counting the number of grubs appearing in February and March under skins of treated and untreated animals. This was done either by manual removal of grubs under the skins of alive animals or by postmortem examinations of slaughtered animals.

Administration of Neguvon by oral route: Two experiments were conducted for the purpose of oral treatment of Angora goats for grubs.

In the first experiment, 336 Angora goats were divided into 7 groups so that each one consisted of 48 animals. First group received Neguvon once in September, second group twice at an interval of 1 month in September and October, third group thrice at interval of 1 month in September, October and November. Fourth, fifth and sixth groups were treated with Neguvon in the same manner as in the preciding groups, except that treatment was started in October instead of September. Seventh group was kept as untreated control. 10 % aquous solution of Neguvon was administered to the animals at a rate of 50 mg/Kg of body weight.

In second experiment, 200 Angora goats were divided into four groups in equal number. One group was treated once in October, another group once in December, a third group once in November. Fourth group was untreated control. The treated animals received orally 10 % aquous solution of Neguvon at a rate of 75 mg/Kg of body weight.

Application of Neguvon by back washing method: Four groups were formed in equal number of 200 Angora goats. Neguvon was applied by back washing to first group once in November, to second group on-

ce in December, to third group once in January. This was done with about 500 ml of 2 % Neguvon solution by throughly wetting the animal's back with a sponge or with hands covered by gloves. A fourth group remained as untreated control.

Results

The results obtained by oral administration of Neguvon at a rate of 50 mg/Kg, are shown in Table 1. The effect of Neguvon is clearly evident from the table, as there is a noticable reduction in the number of grubs in all treated animals as compared to the untreated control. This effect of Neguvon proved to be greatest in those groups which received three treatments. In the groups receiving Neguvon in September, October and November, the average number of grubs reduced from 2.51 grubs for every control animal to 0.18 grubs for every treated animal, namely a reduction by 92.56 %, while in the group treated in October, November and December the reduction was even greater (96.71 %). Results obtained from the groups received two treatments differ from one another in respect of grub reduction. The reduction was 57.84 % in the group treated in September and October, while it was 91. 72 % in the group treated in October and November. This indicated that the group which started to receive Neguvon in October showed a market trend towards increase effectiviness of the treatment. On the other hand in respect of grub reduction there was not much difference between the two groups which received single treatment. Reduction was 66.54 % and 57.02 % for the groups treated in September and October respectively.

The results obtained from oral administration of Neguvon at a rate of 75 mg/Kg in a single treatment are shown in Table 2. As indicated in the table, percent reduction in grub infestation was 48.90 % in October group, 69.94 % in December group and 82.23 % in November group as compared to untreated control. It means that administration of Neguvon in November as a single dose, results obviously in an increased effectiveness of the treatment.

As shown in Table 3, application of Neguvon by back washing method also gave satisfactory results in most of the treated animals to kill the larvae under the skin. It reduced the number of grubs at the rates of 64.07 % in the November group, 92.41 % in the December group and 98. 60 % in the January group as compared to untreated control animals. This trial proved that the effect was greatest in the group washed in January. Success of the treatment in the January

TABLE 1.

Results of the trials with oral administration of Neguvon at the rate of 50 mg/Km against *Przhevalskiana* migrating larvae in Angora goats

Number of groups		Number of treatment	Time of treatment	Number of animal	Number of grub (total and average) per animal				Total number of grub and its average per animal in February and March		% average reduction in the number of grub in treated animals compared to controls
					February		March				
					total	average	total	average	total	average	
Treated animals	I	once	Sep. 4	48	36	0.75	4	0.08	40	0.83	66.54
	II	twice	Sep. 4 Oct. 4	48	49	1.02	2	0.04	51	1.06	57.84
	III	thrice	Sep. 4 Oct. 4 Nov. 4	48	9	0.18	0	--	9	0.18	92.56
	IV	once	Oct. 4	48	52	1.08	0	--	52	1.08	57.02
	V	twice	Oct. 4 Nov. 4	48	10	0.20	0	--	10	0.20	91.72
	VI	thrice	Oct. 4 Nov. 4 Dec. 4	48	3	0.06	0	--	3	0.06	96.71
Untreated control	VII	no treatment		48	111	2.31	10	0.20	121	2.51	

Table 2.

Results of the trial with oral administration of Neguvon at the rate of 75 mg/Kg against *Przhevalskiana* migrating larvae in Angora goats

	Number of groups	Number of treatment	Time of treatment	Number of animal	Number of grub (total and average) per animal				Total number of grub and its average per animal in February and March		% average reduction in the number of grub in treated animals compared to control
					February		March				
					total	avare	total	average	total	average	
treated animals	I	once	Oct. 15	50	164	3.28	92	1.84	256	5.12	48.90
	II	once	Nov. 15	50	57	1.14	32	0.64	89	1.78	82.23 *
	III	once	Dec. 15	50	88	1.56	65	1.30	1.53	3.05	69.94
Untreated control	IV	no treatment		50	267	5.34	234	4.68	501	10.02	

Table 3.

Results of trials with external application of Neguvon (back washing) against *Przhevalskiana* larvae under the skins of Angora goats

Treated animals	Number of groups	Number of treatment	Time of treament	Number of animal	Number of grub (total and average) per animal				Total number of grub and its average per animal in February and March		% average reduction in the number of grub in treated animals compared to control
					February		March				
					total	average	total	average	total	average	
	I	once	Nov. 15	50	120	2.40	60	1.20	180	3.60	64.07
	II	once	Dec. 15	50	34	0.68	17	0.34	38	1.00	92.41
	III	once	Jan. 15	50	5	0.10	2	0.04	7	0.14	98.60
Untreated control	IV	no treatment		50	260	5.34	234	4.68	501	10.02	

group was about the same as that obtained with three oral treatments started in October.

During these experiments, no undesirable side effects of Neguvon were observed when it was applied to animals either orally or externally.

Discussion

So far several methods of treatment with Neguvon were introduced to control cattle grubs [10, 12]. Of these, oral treatment, spray treatment and washing treatment are commonly used [10].

The object of oral treatment is to kill the migrating larvae in the body of animal. Therefore it should be applied to animal by the middle of Autumn [10]. Several test showed that three times oral treatment with Neguvon with doses of 60 mg to 80 mg/Kg of body weight at interval of 1 month, beginning in November or December resulted in a decrease of % 95 to 97.4 % of cattle grub infestation [9, 10, 17, 18, 19]. It was also reported that 86.59 % grub reduction was produced when angora goats received 50 mg / Kg. of Neguvon for three times at intervals of 4 weeks, starting at the beginning of October [14]. In the present study, similar results were obtained in the treatment of Angora goats for grub by using three times oral treatment, but one or two oral treatments were not found to be valuable.

Back washing treatment is recommended for use in Spring for the destruction of the larvae reached under skin of animal [10]. Several investigator showed that one application of 2 % Neguvon solution in Spring brought 89. 9 % to 100 % reductions in cattle grub infestation [9, 10, 20, 21, 22, 23]. Moreover grub reduction became 100 % in the case of two applications at intervals of 4 months, beginning at the end of November [11]. In the case of Angora goats, one application of the preparation in Autumn did not prevent the animals from infestation of this parasite [14]. On the other hand our study revealed that 98.60 % grub reduction was produced in these animals washed with Neguvon solution in the middle of January.

One application gave an impression that spray treatment was not an effective warble therapy method for use in Angora goats, because long mohair of the animal overlaped in a shingle form while spraying and the liquid run off as from a roof and did not get down to skin. In this way much solution of Neguvon has been also wasted.

According to the result obtained from this study, it can be presumed that time and method of application of Neguvon, as well as dose rate, are the principal factors to increase effectiveness against goat grub infestation. This probabaly means that Neguvon has a great effect at a certain development stage of the larvae located in a certain place of the animal body.

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