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Studies for developing fly attractants in poultry ranches

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Summary

A series of experiments were conducted in order to obtain a cheap fly attractant for ranch flies. A mixture of wheat bran, fish meal and sugar was found to be quite effective under local conditions. This attractant could compete with natural attractants present in the ranch.

Introduction

Poultry ranches provide optimal conditions for the existence and reproduction of flies. The presence of egg shells or broken eggs in egg processing rooms, of spilled damp feed around feedbin areas, of garbage, fruit and vegetable wastes in the ranch, of dead birds in or around poultry houses and infrequent manure removal render the ranches a potent source of fly producton. Flies present a severe problem for the poultry industry by spreading human and animal diseases and making working conditions unpleasant. Proper fly control in poultry ranches should start with good farm management practices that reduce natural fly attractants and eliminate the conditions favourable for breeding and development. Under suitable climatic conditions when breeding sources are not reduced, high fly populations will always occur. One of the methods used for controlling flies in poultry ranches is the use of residual sprays. Residual sprays are often very expensive, their residual effect is generally short and resistance may develop to the insecticide. Another way of applying insecticides against ranch flies is the use of toxic baits. These reduce the cost, the hazards to man and animals and there are less chances for the development of resistance. But the lack of efficient chemical attractants has limited their use (Keiding, 1972).

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Several chemicals have been screened as attractants for house flies (Mayer, 1971). Feeding stimulants based on putrefaction products, carbohydrates or proteinaceous baits were also used as attractants (Brown et al., 1961; Wilson and Mulla, 1973a,b; Pickens et al., 1973). A good attractant must compete with the natural attractants present in the areas to which local fly populations have become adapted (Keiding, 1972). In the present work a series of experiments were carried out in a poultry ranch to develop an efficient attractant under local conditions.

Materials and Methods

The experiments were conducted on a poultry ranch in İzmir. The poultry ranch housed approximately 150.000 heavy breeders and 60.000 laying breeders in 26 separate poultry houses. The distance between houses was 25m - 100m according to the age of the breeders. Each poultry house consisted of a slatted floor house with two-thirds slats and one third litter and the dimensions of poultry house was 112x12m. Poultry manure was removed about every 64 weeks. The feeding system consisted of two one way feeder hopper installed at the entrance of the house and driving feed inside the poultry house to the feed-pans by a spiral conveyor system. Each hopper was connected to an outside bulk bin of 8 metric ton capacity. In every poultry house the first 3 meters were used for egg fumigation and in some instances for feed bag deposition.

Several poultry feed ingredients were tested as attractants against ranch flies.

Glass dishes (10cm. diameter) containing the different ingredients (Table I) were placed in three poultry houses for testing their atractiveness to flies. The samples were exposed for 9 to 72 hours.

The temperatures during the experiment and the relative humidity was recorded. The flies present on the dishes were counted and the mean percentages for each test were transformed to angular form and Duncan multiple range test was applied for mean differences at $p<0.05$.

Results and Discussion

From the first experiment (Table I, Test I) it can be seen that there was no significant difference between the percent attractiveness of full poultry layer mash meal and wheat bran alone. Fish meal was less attractive than wheat bran.

The influence of substrate moisture on attractiveness is well documented (Willson and Mulla, 1973b). Thus, in the second experiment (Table I, Test 2)

there was no significant difference between fish meal and wheat bran when both were humidified. On the other hand a mixture of these two ingredients was superior to each component separately. It could be stated that the ratio of wheat bran to fish meal might alter the degree of attractiveness. But as seen in Table I, Test 3 several ratios of wheat bran and fish meal (I:I, 2:I, 3:I, 4:I) did not change the attractancy of adult flies to these mixtures. However, many larvae were found in each mixture, with the 3:I mixture containing more larvae than the others. This was the reason to be selected for the subsequent tests. The results of Test 4 showed that the liquid bait obtained from the extract of 3 parts of wheat bran and I part of fish meal in water had the same attractiveness to ranch flies as the residue of this mixture. Thus, both baits can be used depending on field requirements.

Sugar is known to be a good arrestant for house flies. Dry sugar and water solutions of sugar have been used in toxic baits for a long time. The results in Test 5 showed that 20 % sugar solution can be used in the attractive baits. Addition of the proteinaceous attractant to the dichlorvos sugar-bait had improved the fly-collecting capability of the letter (Wilson and Mulla, 1973a). In test 6, the addition of sugar to the extract of the mixture of fish meal and wheat bran was superior to the extract of the mixture of fish meal and wheat bran alone. Furthermore the extract embedded on cotton wool did not change the attractiveness of the mixture.

From these results it can be seen that the extract of fish meal, wheat bran and 20 % sugar appears to be attractive to ranch flies. The residue and the liquid extract of these mixtures can be used depending on field requirements. The preparation of both are easy and have the advantage of storage and transport.

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Özet

Tavuk çiftliklerinde sineklere karşı cezbedici maddelerin geliştirilmesi

Tavuk çiftlikleri, sineklerin çoğalması için uygun bir ortamdır. Çiftlik içinde kırık yumurtaların, dökülmüş yemlerin, çöplerin ölü tavukların ve gübrenin bulunması, sineklerin çevre için zararlı bir şekilde çoğalmalarına yol açar.

Tavuk çiftliklerinde sineklere karşı mücadelede en etkin yöntem, kuşkusuz temizliktir. Bunun yanısıra, gerekli olduğunda kimyasal ilaçlarla mücadele de yapılır.

Yapılan çalışmalarda, çiftliklerde var olan doğal cezbedicilerle yarışabilecek cezbedici maddeler üzerinde durulmuştur. Birçok denemelerden sonra, kepek ve balık unu (3 : 1) oranında suyla karıştırılıp, bu karışımdan elde edilen tortu veya eriyiğe % 20 şeker eklendiği zaman etkin bir cezbedici elde edilebileceği kanıtlanmıştır.

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Table : I

Attractancy of various materials against ranch flies

Test Number	Material	Exposure period	Percent Attractiveness
I	Wheat Bran	9h	35.8a
	Fish meal	9h	I8.7b
	Poultry by product	9h	33.7a
	Poultry layer mash meal	9h	5.Ic
	Empty dish	9h	7.0c
2	Wheat Bran (Humidified)	48h	28.Ib
	Fish meal (Humidified)	48h	2I.8b
	Wheat bran Fish meal mixture (Humidified)	48h	43.9a
	Empty dish	48h	6.Ic
3	Wheat Bran (Fish meal I:I	72h	23.3a
	Wheat Bran (Fish meal 2:I	72h	30.5a
	Wheat Bran (Fish meal 3:I	72h	34.Ia
	Wheat Bran (Fish meal 4:I	72h	31.1a
4	A'(Residue)	48h	I5.9
	Extract	48h	2I.7
	B''(Residue)	48h	2I.2
	Extract	48h	I3.0
	C'''(Residue)	48h	I4.4
	Extract	48h	I3.8
5	5% sugar solution	24h	I7.8b
	20% sugar solution	24h	49.3a
	50% sugar solution	24h	I6.7b
	Dry sugar	24h	I6.2b
	Water	24h	- -
6''''	Fish meal-wheat bran-sugar 20% (water extract)	24h	27.6a
	Fish meal-wheat bran (water extract)	24h	16.0bc
	20% sugar solution in water	24h	8.7c

Table : I (Continued)

Test Numbers	Material	Exposure period	Percent Attractiveness
	Fish meal-wheat bran, 20% sugar extract embedded in cotton	24h	2I.9ab
	Fish meal-wheat bran extract embedded in cotton	24h	II.9bc
	20% sugar solution embedded in cotton	24h	I3.8bc

A') 72gr of wheat brand and 24gr of fish meal were mixed with 500ml tap water.

B'') 72gr of wheat bran was mixed with 500ml. tap water and heated to boiling point, after cooling, 24gr fish meal was added to this mixture.

C''') 72gr of wheat bran and 24gr of fish meal were mixed with 500ml tap water and heated to boiling point.
All these mixtures were filtered and from each treatment two media were obtained : the extracts and the residues.

'''') Prepared as A only to the water extract sugar was added till a 20% sugar solution was obtained.
Figures with different alphabets are significantly different from each other ($p<0.05$).