

IMIDACLOPRID FLY BAIT: A FAST-ACTING FORMULATION against FLIES in LIVESTOCK

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INTRODUCTION

The insecticide imidacloprid belongs to the chloronicotinyl class of compounds and is most active against insects when ingested (Leicht, 1993; Londershausen, 1996). Its use in fly control is seen as an important area of application. An imidacloprid-based fly bait that could be selectively applied in the areas where flies are active was therefore developed under the brand name Quick Bayt® or PreEmpt™ in the United States. It consists of a red extruded-granule formulation based on sugar with 0.5% active ingredient. The attractiveness of the bait is increased by the lures muscalure (0.1%) and LEJ 179 (0.25%). Bitrex (0.01%) is included to avoid accidental ingestion by humans. Imidacloprid fly bait can be used as scatter bait, in bait stations, or as paint-on. However, the special sugar-based bait formulation especially attracts the larger house fly *Musca domestica* (Linnaeus), (Diptera, Muscidae) and other fly species that are attracted by sugar granules.

METHODS

The effect of the compound imidacloprid in fly bait formulations with different lures and color pigments was assessed in numerous laboratory and field studies. Palatability tests were carried out in livestock facilities in many different countries world wide in comparison to baits with the active ingredients methomyl and azamethifos. The baits were equally distributed in areas with high *M. domestica* activity on paper inside wooden frames (50 x 50 cm). Each trial was replicated three times. The position of the baits was rotated at hourly intervals to minimize variation due to location. Dead flies were counted in hourly intervals for a period of four hours.

The residual efficacy of imidacloprid fly bait was assessed in livestock farms with high fly populations (25 to more than 200 flies per animal). The farms were selected by veterinarians in the North of Germany. Fly infestation was determined directly before application.

The product was dissolved for paint-on application in water in a ratio of 1:0.8 and applied with a brush to areas where flies tend to congregate. As flies usually approach baited areas from the outside margins, the size of a bait-painted area ranged from 5 x 20 to 5 x 40 cm. Application as scatter bait was only done in some limited areas. 200g of the dry formulation were applied per 100m² of stable ground.

RESULTS and DISCUSSION

Imidacloprid is effective against many fly species (e.g., Muscidae, Drosophilidae, and Caliphoridae). Palatability trials in many countries world-wide show an excellent attractiveness and efficacy of imidacloprid 0.5% fly bait in stables against *M. domestica* as a scatter bait. The studies were carried out according to the described study design in Japan, Taiwan, Korea, Thailand, Malaysia, India, Chile, Argentina, Brazil, USA, Poland, Italy, and Luxembourg. Imidacloprid has a mode of action that is different from carbamates and organophosphates, and multiresistant populations of *M. domestica* do not show a significant reduced sensitivity to the Imidacloprid fly bait.

The good efficacy is found especially in countries with severe resistance of flies against carbamates and organophosphates, e.g., in Japan, where 69% of the flies were attracted and killed by the imidacloprid bait, 7% by azamethifos, and 24% by methomyl, respectively.

The residual efficacy trials in German livestock farms show a good long term activity of the imidacloprid fly bait, even under extremely difficult circumstances. The product remained attractive for flies over a period of several weeks, and affected or recently dead flies were observed up to 6 weeks after application.

In pig-fattening units with good sanitation, where flies had only limited access to enter, the fly infestation declined from 41 flies per animal before treatment to 6 flies within 1 day and to 4 flies after 1 to 6 weeks (means of 6 stables). Even in stables with poor sanitation and the possibility of access for flies through open doors, windows, etc., a reduction of flies from 96 before application of the bait to 17 was found after 1 week and 19 after 3 weeks, respectively (means of 7 cattle units).

A high level of multi resistance in the fly populations did not influence the good results with this fly bait. A good knock-down effect was found in all treatments immediately after application of the imidacloprid fly bait as scatter bait and paint-on, respectively.

To scatter the bait was, however, only possible in some limited areas such as in front of the calf boxes and on window sills. When the scatter bait was covered with dust, food, and other materials or brushed away, its efficacy was limited to a few days. The paint-on application had the advantage of being available for the flies over a long period, a factor that resulted in the excellent residual efficacy.

The results indicate that the sanitary management of farm buildings is an important factor that strongly influences the success of fly control.

The good effect of the imidacloprid fly bait was underlined by the fact that some of the farmers had already used fly control products (sprays and baits) earlier in the season with poor success. The fast knock down and long-lasting efficacy of the imidacloprid fly bait was noticed and emphasized by all farmers, even by those with limited interest in hygiene measures.

Imidacloprid is a fast-acting compound. Signs of intoxication are found within 2 minutes after ingestion, and immobilization occurs in less than 10 minutes. The imidacloprid fly bait is an important tool for fly control, especially in livestock, due to its superior advantages against resistant flies in comparison to carbamates and organophosphates.

REFERENCES

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