

The potential for slug control with ferric phosphate

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Summary

Slug and snail damage, especially on young plants can mean serious economic loss for growers. Organic growers have in the past had few, if any, effective products to use for their control. Now ferric phosphate has recently gained organic status from the Organic Farmers and Growers organisation. Its unique mode of action, environmental profile and effectiveness against a range of slug and snail species will make this a first choice for all organic growers. The eventual breakdown components iron and phosphate, will contribute to the crop's nutrient supply.

Key words: Slug control, snail control, ferric phosphate, Ferramol

Introduction

The UK climate can be ideal for frequent and severe slug and snail damage on a wide range of crops. A novel active ingredient, ferric phosphate, is now available for the UK organic grower.

Ferric phosphate offers the organic grower the opportunity to use a totally new pelleted product which, when ingested by a slug or snail, immediately causes feeding to stop. Ferric phosphate is harmless to all other organisms including birds, mammals and humans. Organic growers can now use it under approval from the Organic Farmers and Growers organisation.

Materials and Methods

The ferric phosphate product contains 1% iron phosphate (FePO_3) and 99% inert baiting ingredients made from durum wheat and an attractant. Its use for slug control was invented and patented by Dr. George Puritch and W Neudorff GmbH KG. Certis now have exclusive marketing rights for professional use in the UK. The ferric phosphate product has been branded Ferramol and, following registration, it became available in June 2005.

Field trials were carried out by Neudorff and Certis to investigate the effectiveness of ferric phosphate compared with conventional slug pellets and to establish the rate of use and label guidelines. These experiments were also designed to identify any adverse effects of the treatment.

Results

When the ferric phosphate pellet is ingested by the slug or snail feeding ceases immediately. The

iron phosphate then interferes with the calcium metabolism within the slug and eventually causes cellular pathological changes in the slug's crop and hepatopancreas. This process from feeding to dying normally takes about three to six days. With ferric phosphate, unlike metaldehyde-based pellets, mucus production is not affected so the slugs and snails are able to move away to die.

Ferric phosphate has no undesirable ecological side effects. This active ingredient within the product pellet has extremely low mammalian toxicity. It is virtually harmless to higher animals (LD_{50} rats, oral $> 5000 \text{ mg kg}^{-1}$). Carabid beetles, earthworms, bees, birds and other beneficial organisms are not affected. When it biodegrades it releases iron and phosphorus into the soil for plant uptake. Thus, under normal conditions, ferric phosphate and its breakdown products will have no adverse effects in the environment.

Ferric phosphate is a stable, non-volatile solid that does not readily dissolve in water. This property minimizes ferric phosphate's dispersal beyond where it is applied. It is highly unlikely that ferric phosphate or its breakdown products will persist or become highly concentrated in the environment. When the product is applied as a molluscicide, the amount of additional iron and phosphorus added to the soil is negligible compared to the amount of iron (0.5–5%) and phosphorus (0.010–0.20%) already present in soil. In addition, ferric phosphate and its breakdown products are a source of nutrients utilized by all plants for energy production and growth.

Discussion

This brief view of ferric phosphate has demonstrated the availability of an effective and environmentally friendly slug and snail control product now fully approved for organic growers. Development work is continuing. For example, the effect of different granule sizes is currently being investigated.

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References

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