

# Garlic did not control horn flies as a feed-through in a controlled field study



Horn flies are one of the biggest threats for cattle production in the United States and elsewhere. The flies cause significant losses in beef and dairy animals by reducing weight gain and milk production. Various groups and individual producers have anecdotally reported reduced horn fly populations when feeding various garlic products as granules, powders, oil, etc. **However, to our knowledge, no peer-reviewed scientific publications exist to clearly support or refute that feeding garlic products to cattle consistently suppresses fly populations.**

Pesticides are regulated in the United States principally by the Environmental Protection Agency (EPA). In the case of feed-through insecticides, they can be registered through the EPA as traditional insecticides or an individual state's pesticide office as FIFRA exempt products. FIFRA exempt products are commonly called "25 (b)". Traditional insecticides are required to demonstrate effectiveness and safety, among other requirements according to EPA regulations. The 25 (b) insecticides take their name from the Code of Federal Regulations, Title 40, volume 25, section 152.25 (40 CFR §152.25), the section of the code that regulates their use. These 25 (b) insecticides, such as garlic-containing fly control products, have state-level requirements, in addition to specific information required to be on the label. To the best of our knowledge, neither the US EPA nor any State Pesticide Offices contain registrations for garlic-containing products intended as a feed-through to control flies. Marketing and sale of products to control public health pests (such as many fly species) without registration is illegal.

To test the viability of including garlic into cattle feed, we initiated a controlled field study and monitored the horn fly populations for 14 weeks. A total of 40 animals were split into two groups of 20. The control group was fed only the mineral mix, and the treatment group was fed a mineral mix containing garlic powder. Cattle were pastured in Louisiana, where the control group was returned to the original pasture, while the treatment group was moved to a new pasture approximately one mile away from the control pasture. In both groups, consumption was targeted at  $\frac{1}{4}$  to  $\frac{1}{2}$  a pound of mineral product per animal per day (the target feeding rate was 8.5-17 g/head/day of garlic). Both groups consumed at or above the targeted feeding rates of the mineral mixes. All animals had free-choice access to water tanks and white

salt blocks for the duration of the study. Each week, the consumption of the mineral was monitored and fly counts were conducted at random on 15 of the 20 animals in each group. Due to a hurricane during week 3, no data was collected. Otherwise, the study was completed as described.

The first few weeks showed a larger number of horn flies on control group animals, as would be expected due to the control animals not being moved to new pastures at the study start. All animals had horn flies prior to the study start, and it was assumed the manure in the pasture that originally contained all 40 animals with developing flies continued to produce adults that were counted on the control animals. By week 4 the numbers of horn flies in each group were similar and remained similar through the duration of the study. Weeks 11-12 showed slightly more horn flies on the controls, but this number was not meaningful. Average mineral consumption was 1.1 lb./head/day for both groups, consumption ranged from 0.34-3.72 lb./head/day in the control group and was 0.48-3.08 lb./head/day in the garlic group. No attempt was made to reduce consumption over target feeding rates.

From week 4 to the end of the study, if measured as percent effectiveness, feeding garlic reduced the horn fly population by 25%. On average, this was 26 fewer individual flies per animal. A traditionally registered pesticide (through EPA) is expected to have 90% or greater efficacy. The 25 (b) insecticides are expected to maintain at least 80% efficacy. **In this study, feeding garlic to cattle did not have a meaningful impact on horn fly numbers throughout most of the study period.** When impacts were observed, they were below the minimum expectations required of products, whether or not they are FIFRA exempt 25 (b).

