

PROJECT REPORT

Project Title: Identifying the level of use of aluminum phosphide for controlling burrowing pests in California.

Research Agency: University of California – Kearney Agricultural Research and Extension Center

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Background:

Aluminum phosphide (ALP) is used extensively for burrowing mammal control for a variety of reasons including the fact that it is highly effective, kills quickly, is relatively cheap, kills ectoparasites associated with target species, poses no risk of secondary exposure to non-target animals, and has a strong safety record when applied appropriately. However, recent changes have been made to the ALP label which could substantially limit its utility for burrowing mammal control in the future. As such, I developed a survey for both agricultural and residential users to help quantify the impact that these changes are likely to have on ALP usage and vertebrate IPM in California. These survey findings were compared to information gathered from the California Department of Pesticide Regulation's Pesticide Use Report for 2010 to relate the survey findings to the broader spectrum of users throughout California. Through the surveys, I also explored the potential acceptability of several mitigation alternatives that could reduce the impact of new label changes while making ALP safer to use.

Results:

1. In 2010, 49,005 lbs (46% of total used in California) of active ingredient (AI) of ALP was used for burrowing mammal control. Residential users applied 81% of this total, while agricultural users applied the remaining 19%. Most agricultural applications occurred in almond, wine grape, and alfalfa fields, while most residential applications were in residential yards.
2. I received completed surveys from 21 agricultural users and 26 residential users. These respondents indicated that they used an average of 31 and 137 lbs of AI for burrowing mammal control for agricultural and residential areas, respectively, during 2010. Collectively, their applications represented 7% and 9% of all ALP applications for agricultural and residential users, respectively, during that year.
3. The majority of all agricultural applications were made to control pocket gophers (*Thomomys* spp., 63%); ground squirrel (*Spermophilus* spp.) burrows were also frequently treated with ALP in agricultural areas (37%). The majority of

residential applications were made to control pocket gophers (79%); mole (*Scapanus* spp., 14%) and ground squirrel (5%) burrows were occasionally treated with ALP as well.

4. New buffer restrictions are likely to have a substantial impact on the amount of ALP used to control pocket gophers in agricultural areas (51% reduction in AI applied), but will have less of an impact on applications for ground squirrels (2% reduction in AI applied). An additional 39% and 24% reduction in average application rates of AI are anticipated from new posting restrictions for pocket gophers and ground squirrels, respectively. Collectively, new buffer and posting restrictions resulted in expected losses of 70% and 26% of agricultural applications of ALP for pocket gophers and ground squirrels, respectively.
5. The loss of ability to apply ALP in many prohibited residential sites will dramatically decrease the level of ALP usage in all residential areas (pocket gophers = 68% reduction, moles = 91%, ground squirrels = 47%). New buffer and posting restrictions will have a similar proportional impact on ALP applications in residential areas where ALP can still be utilized (pocket gophers = 76% reduction, moles = 80%, ground squirrels = 44%). A combination of these new restrictions suggests a dramatic drop (pocket gopher = 92%, mole = 98%, ground squirrel = 70%) in the use of ALP for burrowing mammal control in residential areas following the implementation of new restrictions.
6. Agricultural respondents indicated that trapping will be the primary control method used for pocket gophers ($x = 51\%$) in areas where they can no longer use ALP, while baiting will be the primary replacement for ground squirrels ($x = 65\%$). For residential respondents, baiting will serve as the primary tool used for pocket gopher ($x = 59\%$), mole ($x = 50\%$), and ground squirrel control ($x = 71\%$) in areas where ALP can no longer be applied. Interestingly, a relatively large proportion of individuals in both agricultural and residential areas indicated that they would no longer control pocket gophers (agricultural $x = 18\%$, residential $x = 16\%$), moles (residential $x = 34\%$), and ground squirrels (agricultural $x = 22\%$, residential $x = 13\%$) in these areas.
7. Agricultural respondents considered ALP to be the most efficacious management tool for both pocket gophers ($x = 83\%$) and ground squirrels ($x = 82\%$). Trapping ($x = 59\%$) was considered the most effective alternative for pocket gopher control in agricultural areas where ALP can no longer be applied, while baiting was considered the most effective alternative for ground squirrels ($x = 65\%$). In residential areas, ALP ($x = 94\%$) was considered to be by far the most effective option for pocket gopher control. Both ALP and baiting were considered equally effective for mole (ALP: $x = 56\%$, baiting: $x =$

55%) and ground squirrel control (ALP: $x = 72\%$, baiting: $x = 71\%$).

8. Residential respondents indicated that 52% of all ALP applications were made to eliminate potential injury hazards associated with open burrows and mounds, while 8% of ALP applications were made to kill disease vectors such as fleas on burrowing mammals. This indicates that new restrictions on ALP could have an impact on human health and safety.
9. Overall, potential options to mitigate the new restrictions on ALP use for burrowing mammals were positively received. For agricultural users, 100% of respondents indicated that they would be willing to receive training for a special certification category if restrictions were reduced to allow the user to apply ALP for burrowing mammal control in areas up to 25 feet from any occupied structure and if posting restrictions were removed. Acceptance of mitigation alternatives in residential areas ranged from 22–87%. Greatest acceptance (87%) was for the implementation of a special certification category for aluminum phosphide. A second alternative that would increase the buffer to 25 feet *for pocket gophers only* while eliminating the residential application exclusion received almost the same level of support (85%). The presence of a 100-foot buffer was clearly deemed too restrictive (22% acceptance) to allow much of an increase in ALP usage in residential areas where ALP cannot currently be applied.