

Kaput® Feral Hog Bait Briefing

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Intended for:

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Updated: 2/7/2017

Subject:

Briefing on implementation of using Kaput® Feral Hog Bait in Louisiana

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Background on Kaput® Feral Hog Bait:

- Active ingredient in Kaput® Feral Hog Bait is Warfarin (common name: Coumadin)
 - Ingredient concentration in Kaput® Feral Hog Bait: 0.005% Warfarin
 - Considered least toxic of anticoagulants
 - Kaput® Feral Hog Bait contains methylene blue dye, used to dye animal fat a bright blue 24hrs post-consumption
 - Additional Kaput® Baits contain 0.025% Warfarin (5-times more toxicant in these baits compared to the proposed Kaput® Feral Hog Bait)
 - Full Kaput® product list: <http://www.kaputproducts.com/products-labels-and-msds/>
- Warfarin acts as an anticoagulant (prevents blood clotting mechanisms, so animals which ingest Warfarin die from internal hemorrhaging)
 - In use since the 1950, and early use recognized the danger Warfarin posed to hogs (i.e. labels warned to keep away from pig pens)
 - Considered a first generation rodenticide
 - Second and third generation anticoagulant kill with <2 feedings, but persist in carcass and environment for much longer
 - Warfarin persists in soil for ~7 days, but depending on specific conditions, can persist longer (Lao and Gan 2012)
 - Typically broken down into main metabolites in a few days, accumulation through multiple meals leads to anticoagulant impacts and eventual death by internal hemorrhaging
 - Prior work from case studies have shown that rodents which consumed toxicant Warfarin were able to transmit Warfarin to secondary predators (bald eagles, peregrine falcons, turkey vultures, owls, etc.)
- Received Conditional Licensure from EPA
 - LDAF is recommending licensure in Louisiana as a restricted-use pesticide

Directions for Kaput® Feral Hog Bait use:

- Applicators must wear long sleeves, pants, and protective gloves
- Legally, Kaput® Feral Hog Bait can only be administered using secured, specialized feeders with heavy lids to prevent access
 - Public discussion mentions that this may not be efficient enough (see main points of concern below)
- Initially, for the first 3-6 weeks, feral hogs must be baited to a site using non-toxicant laced bait
- After feral hogs have been utilizing the baiting area, non-toxicant laced bait must be switched out with Kaput® Feral Hog Bait
- Multiple meals must be consumed by the feral hogs for the anticoagulant to bioaccumulate in the feral hog system
- Recommendations are made that carcasses be disposed of properly and/or buried

Warfarin use in other states:

- Warfarin, until very recently, was not allowed as a toxicant for feral hogs in the United States (West et al. 2009)
 - Sodium nitrite (through competitor Hog-Gone®) was main toxicant used for feral hogs
 - Hog-Gone® has trials in several states, Alabama, Florida, Mississippi, Missouri, Oklahoma, and Texas, and throughout Australia
 - The use of Warfarin at the scale equivalent to the implementation of Hog-Gone® has not occurred
 - Hog-Gone® needs to achieve 90% kill rate to be approved by EPA, and once that is approved, could take up to 5 years for full, regulatory approval

Kaput® Feral Hog Bait Efficacy:

- At the current dosing of 0.005% Warfarin, it takes roughly ~5 days for full exposure to tested hogs
- EPA Data collection:
 - Multiple plots (8 km² apiece) in area, using 330lb's of Kaput® Feral Hog Bait
 - Spillage out of feeding apparatus was around 1lb (~0.3% spillage rate)
 - Fate of feral hog carcasses fell squarely on scavenging species: coyotes, turkey vultures, crows, additional hogs
 - Using multiple metrics (radio-telemetry, trail cameras, and measuring bait consumption), Warfarin uptake in feral hogs in study sites was >97%
 - Toxicity Data (EPA) on Warfarin to wildlife
 - Mallard: ~0.025% concentration after 14 days, no effects
 - LD₅₀ for mallard: >10,000mg/kg
 - LD₅₀ = lethal dose to kill 50% of tested population
 - Bobwhite quail: ~0.025% concentration after 14 days, no effects
 - LD₅₀ for bobwhite quail: >10,000mg/kg
 - LD₅₀ = lethal dose to kill 50% of tested population

LDWF Concerns about Kaput® Feral Hog Bait:

- Louisiana Black Bears can easily access the feeders
 - Warfarin toxicity to Louisiana Black Bears has not been established

- Compound with the fact that Louisiana Black Bears could consume large amount of toxic bait
- Such a threat and potential mortalities could result in Louisiana Black Bear being re-listed on the Endangered Species Act as Threatened or Endangered with US Fish and Wildlife Service
 - E.g. the Upper Atchafalaya River Basin Bear Management Area has a subpopulation count of 35 female Louisiana Black Bears (aka. Very vulnerable)
 - LDWF must maintain a 91% survival
 - If this subpopulation is compromised, the Louisiana Black Bear can be relisted
- Non-focal species potentially experiencing ill effects of Warfarin:
 - Raccoons, squirrels (and other forest rodents), secondary intoxication and bioaccumulation (bobcats, owls, hawks, eagles, turkey vultures, etc.) is possible
- Widespread concern for misuse of product (e.g. dumping bait on ground, not in specialized feeders)
- The EPA nor the parent company of Kaput® Feral Hog Bait (Scimetrics™) have provided research on the effects of warfarin pertaining to primary or secondary intoxication of non-target wildlife

Main Points of Concern on Kaput® Feral Hog Bait:

- Kaput® Feral Hog Bait (with Warfarin toxicant) not in use in any other state
 - Use of Warfarin (in scientific studies) to manage feral hogs performed outside of United States (majority in Australia) (Wolf and Conover 2003)
 - Main Toxicant being field tested in United States using sodium nitrite compound Hog-Gone® using the Hog-Hopper® (Lapidge et al. 2012).
 - Toxicant here is Sodium nitrite
 - Kills animals in < 2 hrs, labeled humane
 - States that have tried field testing sodium nitrite toxicants on feral hogs are: Alabama, Florida, Mississippi, Missouri, Oklahoma, and Texas
 - Meat labeled safe to eat, less impact on additional wildlife, quick degradation time (PestSmart 2011).
 - While Sodium nitrite has drawbacks and issues, Warfarin usage at this scale hasn't been scientifically studied as exhaustively
- Disposal of carcasses
 - It is recommended carcasses be buried and disposed of properly
 - From anecdotal experience, once a pig dies, the carcass will be very hard to find if found at all
 - Leaves a high potential for carcasses with Warfarin within tissue to remain in open environment for scavenging/transmission to non-target animal species
- Public Opinion/Concerns:
 - Potential that Kaput® Feral Hog Bait may be available across the counter in Texas after May 1
 - What would stop Louisiana farmers from going to Texas, buying it, and scattering it?

- No product information, SDS, chemical codes, or purchasing information available online or on Kaput® website regarding Kaput® Feral Hog Bait. Visit: <http://www.kaputproducts.com/products-labels-and-msds/>
- High degree of public confusion
 - Several discussions in Louisiana-based, online forums show confusion on what's the key ingredient in Kaput® Feral Hog Bait
 - E.g. Believing Kaput® Hog Bait is sodium nitrite, when Warfarin is main toxicant
 - E.g. Believing that if it's sodium nitrite, being safer, Kaput® Hog Bait may be prone to improper handling and misuse by citizens
- Spread to other animals that are not the target species
 - High potential for secondary poisoning of scavengers which feed on dead hog carcasses
 - Crows, Jays, Ravens, Turkey-vultures, Coyotes, etc. will be jeopardized
 - High potential for spill-over from feeders
 - Spillover of toxicant outside of feeder would attract deer and other wildlife to feed, increasing potential for spread through food web
- Latency in decomposition
 - Warfarin takes roughly a week to decompose in soils (breakdown by microbes), but decomposition can be much longer given certain environmental conditions (Lao and Gan 2012)
 - Potential for Warfarin to spread through non-target species in this manner
- Until recently, Warfarin wasn't allowed as an option in the United States
 - This is due to the concerns listed here, namely secondary poisoning and other environmental concerns (West et al. 2009)
- Public questions the efficacy of specialized feeders in administering Kaput® Feral Hog Bait appropriately (high degree of spreading into food chain)
 - E.g. squirrels often get into bird-feeders designed to be only for birds, raccoons have been spotted moving heavy lids to access corn and feed storage, etc.
- EPA did not initiate a formal, consultative process with the US Fish and Wildlife Service concerning the implementation of Kaput® Feral Hog Bait

References:

Briefing compiled from scientific and additional sources below, Kaput® Bait website, Hog-Gone® and Hog-Hopper® websites, APHIS, EPA, TAMU Feral Hog Extension program, and presented information by LDWF Veterinarian James M. LaCour, DVM

1. Wolf, T., and M. R. Conover (2003) Feral pigs and the environment: an annotated bibliography. Berryman Institute Publication 21, Utah State University, Logan; Mississippi State University, Starkville
2. PestSmart (2011) Hog-Gone® Feral Pig Fact Sheet. Hog-Gone® products, AU.
3. Lapidge, S., Wishart, J., Staples, L., Fagerstone, K., Campbell, T., Eismann, J. (2012). Development of a Feral Swine Toxic Bait (Hog-Gone®) and Bait Hopper (Hog-Hopper™) in Australia and the USA. Proceedings of the 14th WDM Conference. pp19-24
4. Lao, W. and Gan, J. (2012) Enantioselective degradation of warfarin in soils. Chirality. 24(1):54-9.
5. West, B. C., A. L. Cooper, and J. B. Armstrong (2009) Managing wild pigs: A technical guide. Human-Wildlife Interactions Monograph 1:1–55.