
Mucuna Trichomes as a Dewormer for Goats

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While researching problems with livestock production in the Dharwad District of Karnataka in southern India, Dr. Czech Conroy and his associates (Livestock Research for Rural Development, 14(3) 2002) hypothesized that poor goat production was due to parasitic worms in the digestive system. While conducting a trial testing his hypothesis using a chemical dewormer, they discovered that the Gawali people, a local caste specializing in buffalo husbandry, used the hairlike trichomes from the seedpods of a wild type velvetbean as a dewormer in buffalo (*Bubalus bubalis*). From this information they translated the technology and applied it successfully to goats (*Capra* spp.).

Their research showed that the trichomes from *Mucuna pruriens* (L.) DC. var. *pruriens* (also known as kewach or cow-itch) were effective in removing parasitic worms in pregnant does, and that there was no significant difference in the effectiveness of fenbendazole (Safeguard[®], Benzelmin[®] or Panacur[®]), a common broad-spectrum dewormer, and the *Mucuna* trichomes in controlling intestinal parasites in the goats.

Wild varieties of velvetbean, *M. pruriens* (L) DC., are generally avoided because the seed pods are covered with fine, hair-like trichomes, specialized needle-shaped cells containing toxins that can be extremely irritating upon penetrating the skin. Farmers worldwide avoid walking in the vicinity of these plants for fear of coming in contact with these irritating hairs.

On certain *Mucuna* plants, each 10 to 13 cm (4-5 in) seedpod bears approximately 5,000 barbed, easily detachable trichomes measuring 2 mm by 20 microns. Upon contacting an individual's skin, these trichomes cause an inflammation thought to be a reaction to toxins that include mucunain (a naturally-occurring nematicide and highly-irritating enzyme that digests proteins) and serotonin (a hormone and important neurotransmitter that has numerous benefits for the body but that also irritates the skin). Even hairs from dried *Mucuna* pods contain these chemicals.

Mucuna trichomes have been sold commercially as "itching powder" and, in the past, as an oral worm medicine. In an ethnobotanical study of the Adivasi people group in Bastar district of the central Indian state of Madhya Pradesh, Dr. S.K. Jain (Economic Botany 19(3):236-250; 1965) reported the use of *Mucuna* trichomes as an oral dewormer for children and calves.

He wrote: "Stinging hairs on the pods are scraped off with a knife, mixed in solidified sugar cane juice and made into pills to kill stomach worms in babies and calves. The worms die and are expelled." No details as to dosage were given in the

article. Other sources have reported mixing honey or syrup with the trichomes, although Conroy, et al seems to be the first to document dosages for deworming animals (Livestock Research for Rural Development, 14(3) 2002).

Deworming Recipe

The following recipe is the formulation Conroy used for the trichome dewormer: 20 mg of trichomes per kg of body weight of animal (one seedpod contains about 100 mg of trichomes). 20 grams sugar

Dissolve 10 g sugar in warm water, and using a bottle (Fanta, Coke or beer) or large dose syringe, drench the goat with this mixture. Drenching is the method of administering liquids to an animal by pouring it directly down its throat. When drenching a goat, keep the animal's head in the normal position. Place the end of the dose syringe or bottle in the left side of the goat's mouth on the back of the tongue. Slowly pour the drench into the esophagus. This position is important so the goat doesn't aspirate or inhale the drench.

Dissolve the remaining 10 g sugar in warm water with the required amount of trichomes, and drench once again.

In the study, pregnant does were treated 15 to 30 days prior to kidding and re-treated the day of kidding.

This deworming plan was implemented for purposes of the experimental trial, and for pregnant does. If you choose to use *Mucuna* trichomes for deworming your goats, we recommend applying it to your regular worming schedule.

In the experimental trial, deworming the does significantly decreased the parasitic worm population. There was no significant difference in the average birth weight of kids born to treated and untreated does. There was no significant difference in kid mortality in the first month after birth, but at four months, mortality was significantly higher in kids born to untreated does. The average weight gain in kids born to treated does was significantly higher than that of kids of untreated does.

Both treatments of fenbendazole and *Mucuna* significantly improved the productivity of the goats. The major difference for the farmer was the cost.

Safety Precautions

When working with *Mucuna* trichomes, safety cannot be stressed enough. These trichomes are dangerous, can easily enter the skin, mouth, nose and eyes, and should be treated as a chemical pesticide. When handling the trichomes or when near them in the field, proper protective clothing should be worn, particularly gloves, goggles, facemask, long sleeves and long trousers. Clothing should be well laundered after working with or near the trichomes.

The trichomes are scraped or "shaved" off the pod with a knife, scraping from the top down so as not to cause the hairs to "fly". Do this in an area out of the wind. Trichomes may be stored in plastic bags with zippered closures and will maintain their chemical potency even after they have dried out.

Should any trichomes come in contact with your body, within approximately 30 seconds after contact you will probably experience an itching and sometimes burning sensation that can last up to about two hours. This may be accompanied by swelling, redness and/or small blisters. The best first aid is to get out of clothes

that may have the trichomes and wash the affected area with soap and water. This will remove the trichomes and dilute the irritant chemicals. Adhesive tape will also remove trichomes. Since the irritation is not histamine induced, there is some question whether medication such as benadryl® (diphenhydramine) would be effective in reducing the itch, but some literature recommends it.

Availability

The farmers with whom Conroy, et al worked were pleased with the outcome of the deworming research, and they were especially pleased that they could use an effective dewormer at minimal cost. Since Mucuna trichomes are an available resource in Africa, Asia, the Americas and tropical islands, this could prove to be a very appropriate technology for small farmers!

This is one seed variety, however, that we do not carry in the ECHO Seed Bank. Should you wish to utilize this deworming technique, we recommend that you only try it if hairy mucuna is already growing and you can harvest it in the wild.

Comments:

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