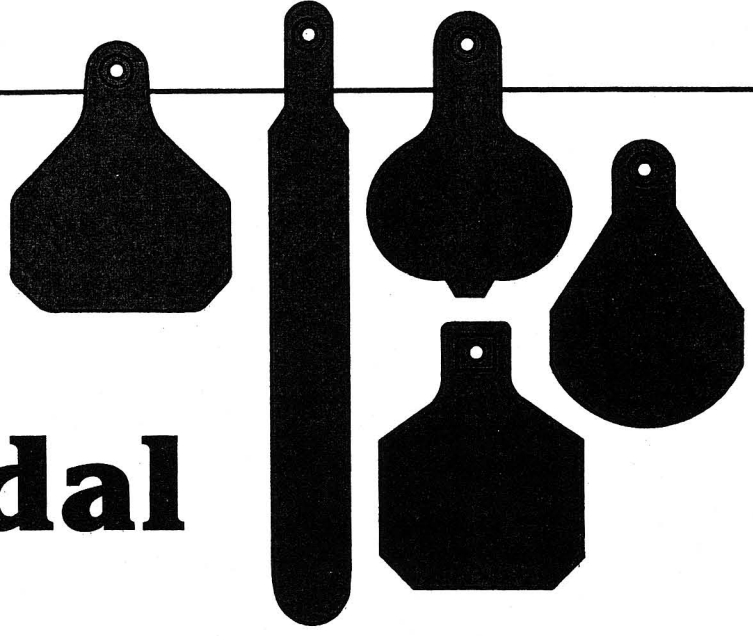
Use of insecticidal ear devices has become an efficient method for controlling horn and face flies that bother cattle in pastures. Their widespread adoption has created much interest among cattlemen. Dr. Robert Hall, an entomologist at the University of Missouri—Columbia, answers some questions that are on producers' minds. "The biggest issue this year is going to be the fly resistance problem," says Hall, "but producers need to realize the number of reported ear tag failures is very small in relation to the number of tags being used."



Insecticidal Ear Tags

Q: How do insecticidal ear tags work?

A: Active materials used in insecticidal ear tags kill insects by direct contact. These chemicals are mixed (or formulated) into the plastic during the manufacturing process. Because chosen insecticides are very soluble in fats and waxes, they tend to dissolve out of the tag and into the oils present on the animals' hair. Body movement and interaction between cattle facilitate the spread of the insecticide over much of the body area. Insects do not have to contact the tag itself, and there is no vapor-phase activity such as occurs with dichlorvos resin strips. In some cases, it seems there is some repellent activity associated with these devices, but how much is still open to question.

Q: Which pests are effectively controlled by the tags?

A: Insecticidal ear tags are currently labelled for control of face flies, horn flies and some other species of flies affecting cattle. They are very effective against horn flies and typically produce more than 95 percent control. Activity against face flies is variable; however, treatment with two tags per head offers control superior to that afforded by other methods. Cattle in corrals or drylots are often bothered by house flies on their faces, and the tags have provided some control of this species.

Q: Will the tags control ticks and lice?

A: Test results available at present indicate currently-registered insecticidal ear tags do not produce consistent control of body ticks or lice on cattle. In some experiments, they have been very effective, but in others the control obtained has been poor. There is research underway to identify compounds which might produce tick and louse control with the ear tag method of treatment.

Q: Which brand of insecticidal ear tag is best?

A: At present, three materials are available in insecticidal ear tags: fenvalerate, permethrin and flucythrinate. These chemicals are known as synthetic pyrethroid insecticides, and all three have similar toxic properties. When used in insecticidal ear tags, these compounds perform in an almost identical manner. Permethrin is formulated into plastic ear tags at a concentration of 10 percent, fenvalerate is used at 8 percent and flucythrinate at 7.5 percent. Fly control on cattle will be about the same no matter which brand of tag is chosen. Therefore, availability and price structure often dictate which tags are used most.

Q: Which tag attachment system is best?

A: With the exception of Ectrin stick-on tapes and Permectrin tie-on strips, all insecticidal ear tags are designed for two-piece attachment. Tags are applied by using specially designed pliers which hold the tag and button and permit the operator to quickly affix the device to the ear. The All-flex system uses buttons which have a hollow tip, and the pliers' pin projects through the button's end. Other systems use buttons with solid ends, made of brass or plastic. All available systems work, but operators usually develop a personal preference for one style. Properly applied, any of the tagging systems should afford excellent tag retention in the ears.

Q: Do tags have to be removed before cattle are sold?

A: There is no such requirement, but insecticidal tags are removed before cattle are sent to slaughter.

Q: **If tags are left on cattle over winter, will they control flies the following summer?**

A: Experiments have demonstrated that the insecticidal activity will persist into the following season. However, the plastic itself usually does not fare well during the cold weather. Cracks and splits are common, and the tags frequently break off at the neck. Repeat application is recommended each spring. Some producers are worried that tags left on cattle over the winter might produce adverse reactions with cattle grubs. There is no reason for this concern because insecticides used do not have any systemic effect and will not offer control of cattle grubs. In the same vein, there is no danger of protein shock resulting from midwinter kill of cattle grub larvae by tags left in place from the preceeding summer.

Q: **How long do tags remain effective?**

A: Studies indicate insecticidal ear tags applied during mid-May will control flies through late September and often into October. We consider this season-long control.

Q: **How long does it take for tags, once applied, to begin killing flies?**

A: Fly kill has been observed as soon as six hours post treatment, but full efficiency usually appears in a day or two.

Q: **Is it best to use one or two tags per head?**

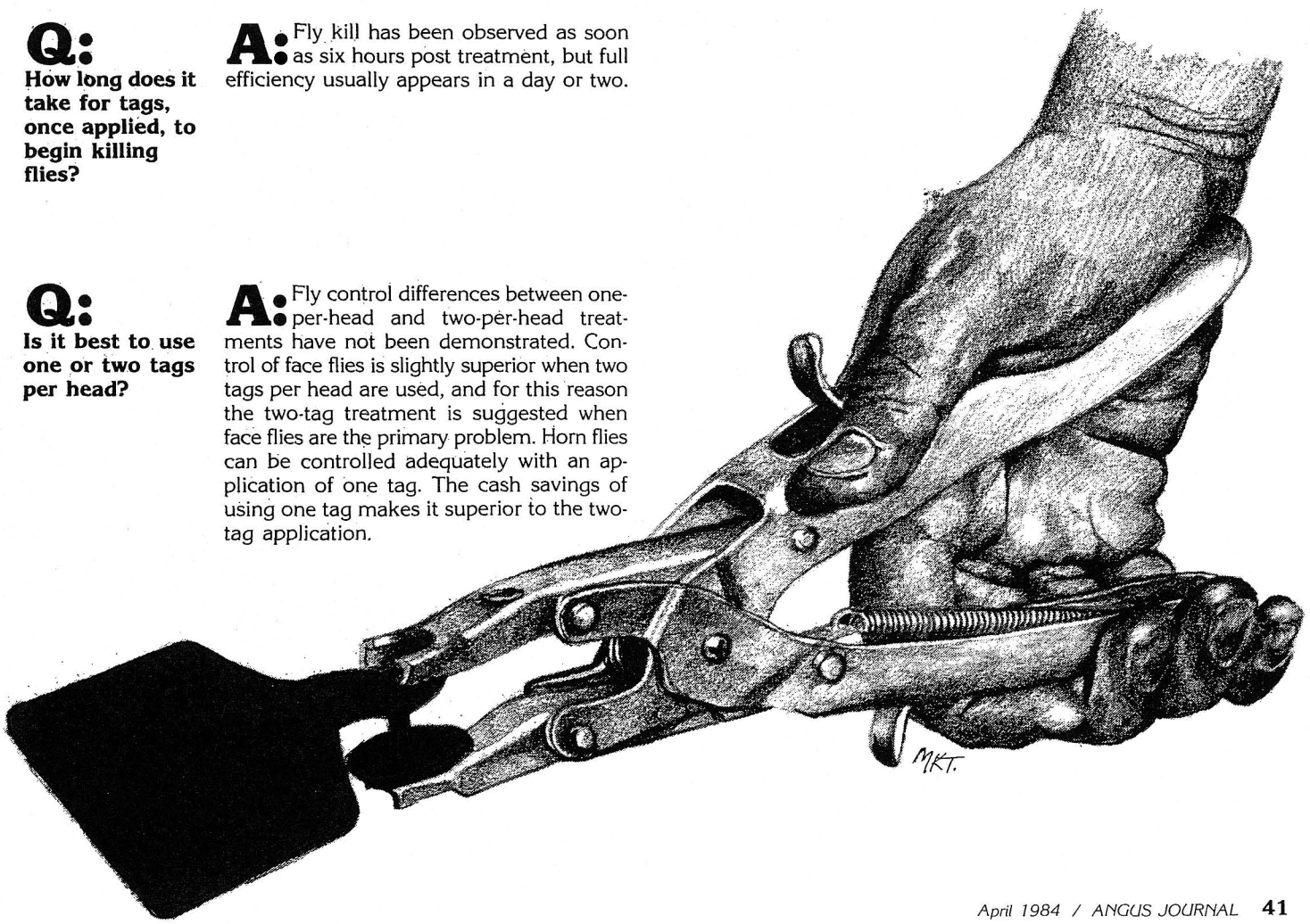
A: Fly control differences between one-per-head and two-per-head treatments have not been demonstrated. Control of face flies is slightly superior when two tags per head are used, and for this reason the two-tag treatment is suggested when face flies are the primary problem. Horn flies can be controlled adequately with an application of one tag. The cash savings of using one tag makes it superior to the two-tag application.

Q: **If only the cows or calves are to be tagged, which should be chosen?**

A: In cow-calf herds, treating the cows is recommended. Insecticide available on the cows' hair will tend to offer some protection to calves when they contact the cows. Treatment of calves alone will not offer much in the way of protection for cows. Although there is no hard and fast rule against tagging newborn calves, most entomologists feel it is better to wait several months before applying insecticidal tags to these animals.

Q: **How do you best mark on insecticidal ear tags for identification purposes?**

A: Insecticidal ear tags are not well suited for identification because they often are lost during the winter season. However, they can be numbered or lettered if producers desire. The rubbery ear tag paints sold in squeeze-tip bottles can be used. These paints require a day to dry, so some planning is in order to have tags marked and ready prior to application. Ear tag markers similar to felt-tip pens have not proven effective, and numbers made with these devices quickly fade from insecticidal ear tags.



Insecticidal Ear Tags

Q: When should the tags be applied?

A: It is recommended herds be treated during mid-May (shortly before fly season starts) to obtain maximum protection from face flies and horn flies.

Q: How should insecticidal ear tags be removed, and what should be done with them afterwards?

A: Tags are removed easily by cutting the shaft of the button with side-cutting pliers. Be careful not to cut the ear. Once removed, tags should be wrapped and buried in a manner similar to disposal methods for used pesticide containers.

Q: What safety precautions should be observed while tagging?

A: While working cattle, avoiding getting trampled or injured is foremost in everyone's mind. With this overriding concern, it is easy to forget you're working with pesticidal (toxic) materials. It is recommended gloves be worn while tagging, or that someone wearing gloves be assigned the task of loading the applicator pliers with tags and buttons. Don't smoke, chew, drink or eat until you have washed your hands, and don't hold several tags in your mouth while working fast at a headgate!

Q: Where in the ear should the tag be applied?

A: Best success has come from placing the tag about halfway from the base of the ear to the tip, and making sure it is seated above the second "rib" of cartilage. This can be felt quite easily. Tags seated too low in the ear will pull free quickly. Reusing old ear tag holes is probably not the best approach for maximum tag retention, although an old hole may be used if the old tag has just been removed and the hole is not infected or enlarged. The principal thing to avoid is placement in one of the large holes made by old-style one-piece tags. To do so virtually guarantees early loss of the tag.

Q: How much do the tags cost?

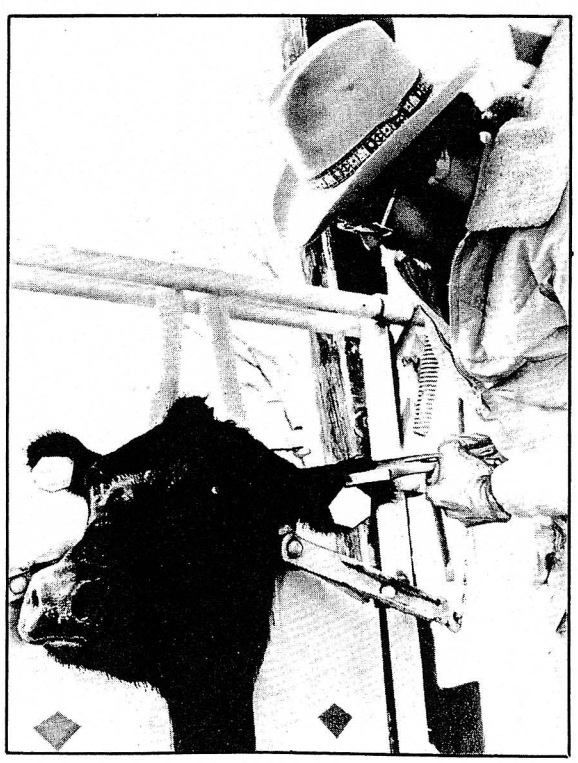
A: This is an often-asked question, and one for which there is no ready answer. Many suppliers are now offering the tags (see list at the end of this article). Producers are advised to use the telephone to get price quotes from local distributors. The average tag price tends to fluctuate around one dollar apiece.

Q: Will the tags control pinkeye?

A: No. This is probably the most misunderstood aspect of the ear tag system. Insecticidal ear tags offer no therapeutic value against infectious bovine keratoconjunctivitis. This disease was present long before the face fly ever reached U.S. shores. Research has shown, however, the face fly is a vector of the pathogen which causes bovine pinkeye. Therefore, face fly control is a necessary part of a comprehensive pinkeye management program, and ear tags are well suited for this approach. Producers should be aware that use of insecticidal ear tags does not guarantee pinkeye will not occur in a herd.

Q: Can use of insecticidal ear tags be justified on an economic basis? That is, if $50 is spent for ear tags, will money be refunded in improved performance?

A: Knowledgeable producers are reluctant to waste money. The best-defined economic justification for use of insecticidal ear tags is as part of a management program for pinkeye. Detrimental effects to cattle production are well known. Subjective factors, such as fly annoyance to grazing cattle, are less thoroughly documented. Current research data indicate face flies probably do not exert an adverse effect on cattle weight gain or feed efficiency. Average populations of horn flies are probably not an economic threat, but we occasionally see horn flies build to damaging levels. Therefore, each producer must define what fly control on cattle is worth to them.



Insecticidal Ear Tags

Q: Is there a fly resistance problem to insecticide-impregnated ear tags?

A: Recently, there has been data accumulated which indicate horn fly populations in various areas of the United States are becoming resistant to chemicals used in insecticidal ear tags. However, the number of reported ear tag failures has been small in relation to the number of tags used. Possible recommendations to help avoid resistance include: 1) Use other horn control methods in addition to the tags, such as dust bags and oilers. Insecticides other than synthetic pyrethroids, which are in the ear tags, should be used in this alternative treatment. 2) Remove ear tags at the end of fly season. Leaving them on through the winter months allows for a continual low-level insecticide release which could hasten development of fly resistance. 3) Possibly treat at maximum levels (two tags per head). 4) If there is a resistance problem with one brand of ear tag, changing to another will not help. Research indicates horn flies resistant to permethrin will also be resistant to fenvalerate. More research is needed to determine why resistance is occurring in some locations and what can be done about it. Even at a local level, horn flies on cattle in one pasture will be resistant, while control will be excellent on cattle a mile away. Likewise, several horn fly resistance cases may be confirmed in one state but none in surrounding states despite similar management practices and climatic conditions.

Q: Should tags be used on other livestock or domestic animals?

A: American ingenuity is almost limitless. Ear tags have been seen on horses, goats, dogs and even on people. In these cases, they are usually attached to halters, collars or pant legs. In some cases, they work well. In all such cases, this use is a violation of label directions and is illegal. Don't do it. Work is being done on expanding the role of slow-release plastic formulations of insecticides so safe and effective uses will be available on a legal basis. Until then, confine your use of these materials to beef and dairy cattle.

Q: What's the status of current research efforts?

A: It is believed improved types of plastic might forestall deterioration and improve control. Relative efficiency of several plastic matrices containing permethrin are being studied. In addition, enlargement of the surface area might permit more active ingredients to be released. Tags with a "granulated" surface are being field-tested. The whole field of slow-release plastic formulations of insecticide is an active area of research in animal health. In most cases, it tends to be labor-economical, effective and it limits the amount of actual insecticide used. For example, cattle ear tags release less than a gram of active material over the entire summer season. Producers can expect continual refinement of this technology for cattle and other species of farm animals.

AJ

Partial Listing of Insecticidal Ear Devices Currently on Market

Name	How applied[1]	Producer
	Ear Tags—10% permethrin	
Atroban	Allflex system	Burroughs Wellcome
COOP Insecticide	Allflex system	Farmland Industries
Fearing DuFlex	DuFlex system	Fearing Manufacturing
GardStar	Y-Tex system	Y-Tex Corporation
Insecta-Gard	Allflex system	Ralston Purina Co.
Jen-Sal	Allflex system	Burroughs Wellcome
Permectrin Tag	Allflex system	Anchor Laboratories
Permectrin Strip	Cable tie-on*	Anchor Laboratories
Deckem	DuFlex system	Fearing Manufacturing
	Ear Tapes—1.2 grams permethrin	
Ectiban	Wraps around an existing tag*	ICI Americas, Inc.
	Ear Tags—8% fenvalerate	
Ear Tag Plus	Allflex system	Moorman Manufacturing
Ectrin	Allflex system	Diamond Shamrock Corp.
Insecta-Shield	Allflex system	Ralston Purina Co.
Starbar	Temple system	Thuron Industries Inc.
Vet Shack	Allflex system	Great Plains Chem. Co.
	Ear Tags—7.5% flucythrinate	
Guardian	Allflex system	Cyanamid Ag. Div.

*Indicates attachment to an ear tag already in place.
[1]Attachment systems may not be interchangeable between different brands.