

MANAGEMENT ALTERNATIVES TO MINIMIZE FOOTHILL ABORTION

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Foothill abortion in cattle, also known as Epizootic Bovine Abortion (EBA), is caused by a bacterial infection acquired from the bite of the Pajaroello tick on non-immune heifers or cows that are 2 to 6 months pregnant and the result is either abortion or weak calves at birth 100 to 145 days later. The impact of tick exposure between conception and 2 months of gestation is unknown but could potentially result in early embryonic loss or term abortion; therefore, the authors would suggest minimizing tick exposure any time early in pregnancy. The tick has been found in foothill areas of California, Northern and Central Nevada, and Southeastern Oregon (Figure 1), as well as in Mexico. It has been found at 600 to 8,000 feet in elevation. The disease occurs wherever the tick is present, but may not be recognized, either because tick numbers are not high enough to cause obvious losses, fetuses are not recovered or the disease is not diagnosed. Foothill abortion (and therefore the tick) appears to be moving further north and east based upon disease outbreaks being reported in Southern OR. Reports of term abortions (diagnosis has not yet been confirmed) that could potentially be foothill abortion have been noted in Central and Eastern Oregon and Southwestern Idaho. The reason(s) for the apparent range-expansion of foothill abortion is unclear but may be due to a combination of warming climate, increased seasonal movement of cattle or ranchers now becoming aware of the disease. Any arid regions in the West with a thriving deer population could serve as potential habitat for the Pajaroello tick.

Four facts required to manage to minimize foothill abortion

Tick bites 2-6 month pregnant heifer



There are three management approaches to minimizing Foothill Abortion. Because each ranch is unique, management alternatives to minimize Foothill Abortion should be clearly thought out by considering all factors involved in the economical production of cattle.

1. Avoidance
 - a. Not grazing tick pastures when heifers are under 6 months pregnant
 - b. Graze stocker steers through the field first
2. Changing Calving Dates or Season
3. Exposure
 - a. Pre-exposure
 - b. Post-exposure

For these methods to be successful, tick pastures must be identified. This can be done either by using dry ice to identify the existence of pajarosello ticks in bedding areas, or by using past abortion history to determine the pasture that tick exposure occurred in. The latter is accomplished by subtracting the disease incubation period of three to four months from the date of abortion in order to identify the field cattle were in at the time of exposure.

Define the non-tick pastures and tick inhabited areas by:

Observing places where deer bed, and where deer activity is obvious in your pastures. If deer numbers are down in your area, you may need to ask others about the local deer populations several years ago. Observing protected areas where cattle bed in hot weather that would allow deer activity and tick survival. Ticks have been found under oak, pine (including pinyon pine), juniper trees or manzanita, high brush, and protected outcroppings. Wet areas or irrigated pastures are usually free of the pajarosello tick unless they have trees or brush on dry areas that are fenced in with the irrigated pasture.

Tick presence can be determined by using dry ice to attract ticks and identify their presence. This method works best in the warmer months, and in areas that cows have not grazed for at least the last two (2) months. The dry ice gives off carbon dioxide (CO²), simulating a host animal's breathing. Ticks come to the dry ice from many feet away prepared to feed on a host. They can

be seen while moving, picked up and stored in plastic pill vials. Here are some tips for optimum collection. Collect during the peak tick activity period for your location. Collect before livestock are placed in the area. Remember that ticks only feed every 60 to 90 days. Thus, if cattle have been in the area prior to collection, the ticks may already be fed and not attracted to dry ice. Field experience indicates that you probably won't find ticks in areas where ants are numerous. Ticks probably aren't there because animals do not bed there or possibly because ants may prey on the tick. Wear gloves to handle the dry ice, this will prevent the freezing of dry ice to your fingers. Dry ice can be obtained from a variety of stores and markets or directly from ice distributors. Schedule dry ice deliveries since it is not always available on demand. Take an ice chest to store the dry ice during transport and collection. Dry ice can be stored in your freezer overnight if needed. Remember good ventilation of the dry ice is required because it can be dangerous to humans in a confined area such as a car or small room without adequate air circulation. Place dry ice in areas, such as deer and cattle bedding grounds under brush and trees. When working on hillsides, the down-hill side of trees or shrubs is best. Avoid creek beds, flood plains and wet areas. Wear protective clothing (high boots, long sleeved shirts) to avoid personal tick exposure. Use of a tick repellent on your socks and pant legs may also be advised since the aftermath of a pajaroello bite can be quite painful.

Two Methods for Capturing Pajaroello Ticks

One method requires the use of a 1 inch deep pie pan. Bury the pan so the edges are level with the ground surface. Place the dry ice on top of an inverted paper cup in the center of the pan. The slick side of the pan prevents the tick from crawling out after being attracted and falling in. Leave the site for 30 to 60 minutes before checking the pan for ticks. If you place the dry ice in the bottom of the pan, the ticks may actually crawl on to the ice and die. The second method is a faster procedure that is useful for screening a wide area of the ranch. Under suspect trees, clear the debris from the ground in an 18 inch diameter and place a 3-4 inch piece of dry ice in the center. Repeat this procedure in a circular or looping pattern in the pasture to allow you to check the dry ice every 10 minutes or so. Select the next location while you can still see the last placement of dry ice. The looping circle will help you relocate the dry ice you put out. Ticks will be observed crawling toward or resting near the ice. This requires good observational skills. The ticks may stop moving when you first walk up to a dry ice site. Be patient. Remember movement is best detected by looking slightly to one side of the suspected area--not directly at the area.

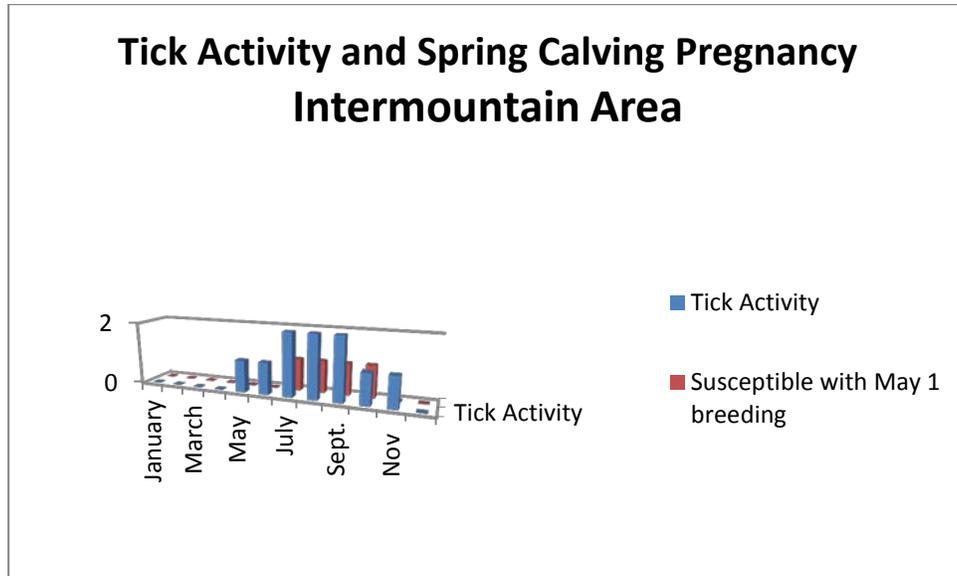
Cattle Management Strategies

Avoidance

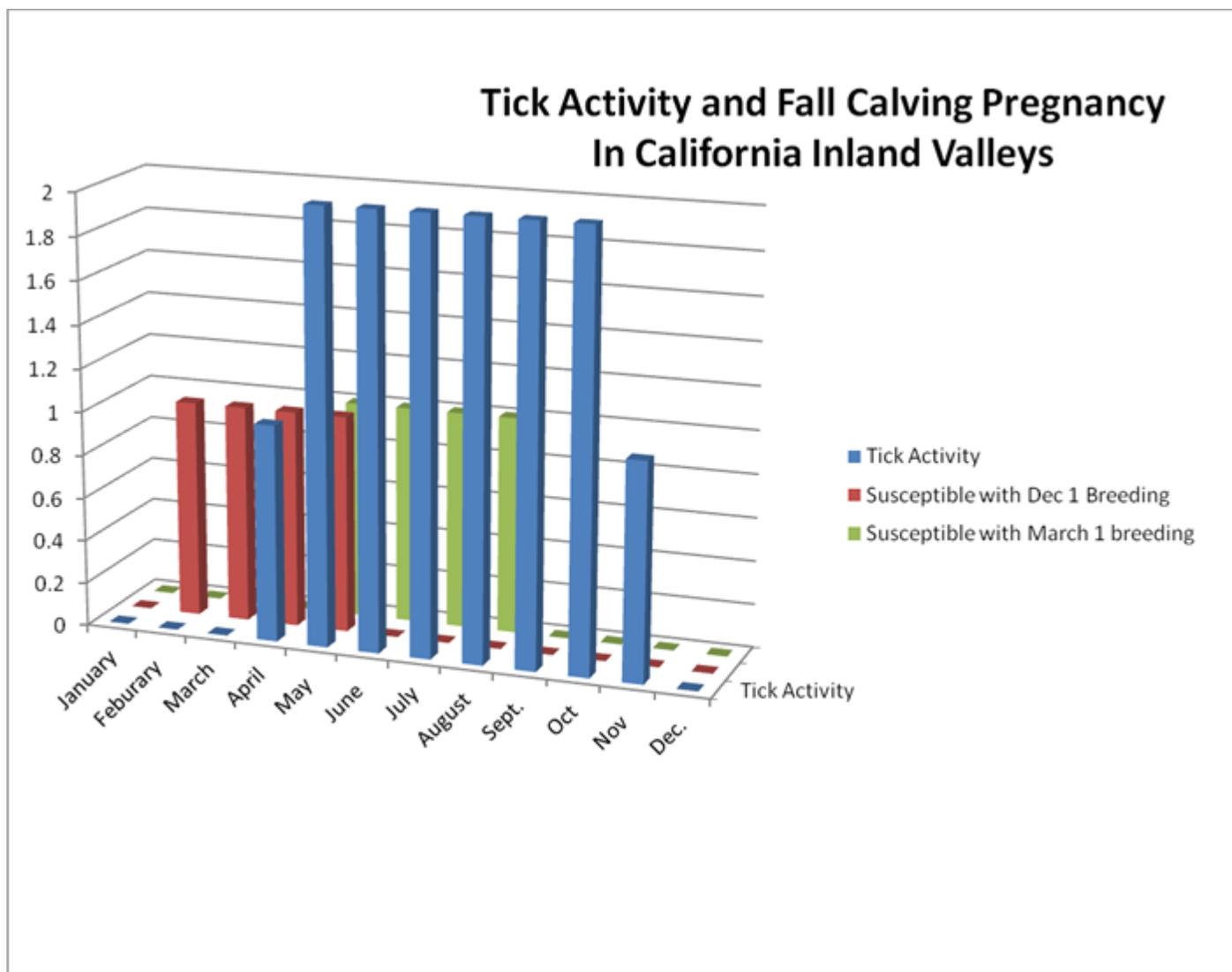
Avoidance can be accomplished by grazing the cattle in non-exposure fields (irrigated, wet meadow or identified by tick trapping) during the susceptible months (less than 6) of pregnancy. A short breeding season will make this a better method to implement. The other is to run stocker cattle in the pasture first to graze off the best forage and get bit by the tick. Given that ticks usually only feed every 60 to 90 days, you then have a two month window for grazing heifers or cows with a likely reduced exposure. Based upon molecular biology, only a small percentage of ticks carry sufficient numbers of the bacteria to infect cattle; this concept is supported by the difficulty to transmit foothill abortion following artificial feeding of ticks on individual pregnant animals. Thus, a total elimination of hungry ticks in your fields is unlikely to be required to reduce foothill abortion losses.

Changing Calving Dates

Calving dates were traditionally oriented to match the range resources. Generally this evolved from cows conceiving during the highest nutritional phase. Altering the breeding season can reduce tick exposure of pregnant cattle before they are six months in gestation. An example in some areas would be going from spring to fall calving, and in others moving to a September - October calving schedule. Spring calving, as portrayed in the graph below, positions cow susceptibility during the peak tick activity.



Even moving fall calving up can minimize exposure as the graph below illustrates.



An Important Disclaimer Regarding “Tick Activity”

When we talk about peak tick “activity” what we are really referring to is the season when ticks are most likely to transmit the bacteria if they bite our cattle or when it is hot enough that the cows bed in shade where ticks are i.e. the warmer months of late spring through early fall. However, experienced personnel have collected the pajaruelo in every month of the calendar even when there were still patches of snow on the ground. Anecdotal information strongly suggests that ticks begin transmitting the causative bacteria whenever day-time temperatures consistently reach 70 degrees or higher. This situation has unfortunately resulted in cattle aborting as the result of tick exposure that occurred during an unseasonably warm February.

Pre-exposure of heifers

Heifers can be pre-exposed to the tick and develop immunity. Anecdotal evidence suggests that heifers must be at least 6 months of age, leading to the thought that they must have reached puberty in order to become immune. While this is a good rule of thumb, sexual maturity may not be the key. More likely, it is a combination of when calves lose their maternal immunity (which appears long-lasting) in conjunction with how much tick exposure they receive after this point and prior to breeding. Pre-exposure has been used in the coastal area with a great degree of success. The degree of success of pre-exposure depends on the density and feeding habits of the ticks. Pre-exposure may also require a change in grazing patterns, reserving the worst tick pastures for use by heifers. Operations with both spring and fall calving have incorporated a switching of replacement heifers from one herd to the other and breeding at eighteen months of age to minimize Foothill Abortion. Heifers from the spring herd are kept and bred at eighteen months of age in the fall herd, which has the previously mentioned advantages of avoiding tick activity in the intermountain area during the susceptible period. Heifers from the fall herd are kept and bred at eighteen months and exposed during the summer prior to breeding in the fall. This system has the advantages of decreasing Foothill Abortion, but requires six more months prior to a return on investment. This cost should be clearly evaluated to compare the six month longer investment versus the losses from Foothill Abortion in heifers.

Post Exposure

Using the last three months of pregnancy, in which the cow is not susceptible to abortion when bitten by the tick, to develop protected immunity is another strategy that has been used to minimize the impact of Foothill Abortion. Keeping heifers and/or cows in non-tick areas until all of the cows are beyond the sixth month in pregnancy and then placing them in high tick exposure pastures can increase natural immunity to Foothill Abortion while not being detrimental to the fetus. Again, this strategy may not meet vegetation goals on public or private lands. The amount of success of this strategy depends on the tick activity during the period of exposure and the number of ticks that are within your rangeland.

Typically, both pre- and post-exposures have been more effective in the valley and coastal areas than in the mountainous areas. The number of ticks in a pasture can be determined by the degree of previous abortions and/or by placing dry ice in the bedding or loafing areas to determine the amount of ticks present. Successful management to minimize Foothill Abortion requires research and consideration by each operation.

Immunity Can Be Lost

As with vaccinations that require annual booster shots, immunity to the bacteria that causes EBA requires the cow to be exposed to tick feeding annually (boostered) in order to be assured that immunity continues. Studies have shown that immunity lasts at least 1 year but will likely wane over time unless the cows are re-exposed. Tick density undoubtedly impacts “length of immunity”. We would emphasize that only a small percentage of ticks carry sufficient numbers of bacteria to transmit disease; therefore, movement of cattle through tick habitat does not guarantee exposure. Cattle that aborted in the past may produce a second EBA abortion upon being returned to pajaroello habitat.

An Intermountain Area Management Example

A Lassen County ranch, near Susanville, had 50% Foothill Abortions. These cows calved in February and March and were grazed on Forest Service permits in the mountains. This ranch had a four pasture system on their Forest Service summer range. By subtracting the three to four months from the abortions period and dry ice tick trapping, one pasture was found to be the major tick source. They then created a September to October calving herd to run in this pasture that would be over six months pregnant, when they were exposed to the tick. The spring calving herd grazes the other three pastures with lower tick populations. It is interesting to note that the tick free pastures are comprised mostly of meadow and the tick infested is predominantly timber/brush with rock outcroppings. Also, the spring calving herd calving date was moved from March to April. The spring calving cows went on the Forest Service pastures on June 1. The bull turnout was moved back one month. Thus, in the highest tick exposure month of August, these cows are only 30 days pregnant. However, pre-exposure to the tick to develop immunity is not as successful in the intermountain area as it is in the coastal or valley foothill situation. This ranch, through these combined efforts, has reduced their Foothill Abortion to near zero. Since each ranch is a unique operation, you may want to discuss different solutions and their financial impacts with your local veterinarian and U.C. Livestock Farm Advisor.

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