UC CE University of California Agriculture and Natural Resources Cooperative Extension

# Northern California Ranch Update

Volume 6, Issue 1 - January 2017

## 2015/16 Northern California Winter Pasture Experience Varies

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Forage production on California annual range is highly variable. The 2015/16 forage year started with a warm and moist fall. These rains coupled with winter moisture and then favorable spring rainfall in some areas resulted in average forage production in a Redding area plot and above average results in Marysville area. Figure 1 represents long term plot data on a ranch located near the Redding Airport with an average annual production of about 1500 lbs/acre. The 2015-2016 annual production is estimated at about 101% of normal.

**Figure 1**

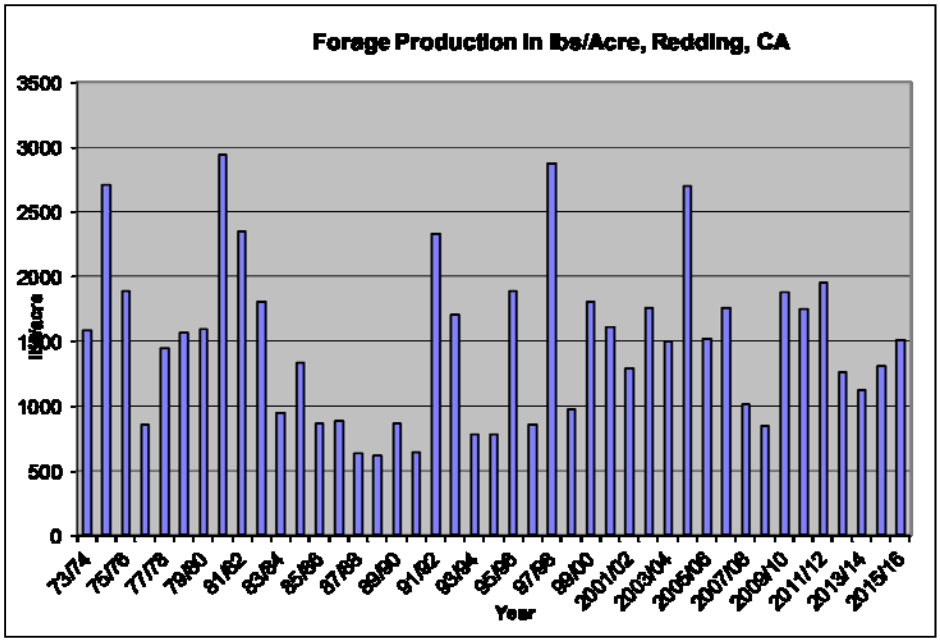


**Figure 2**

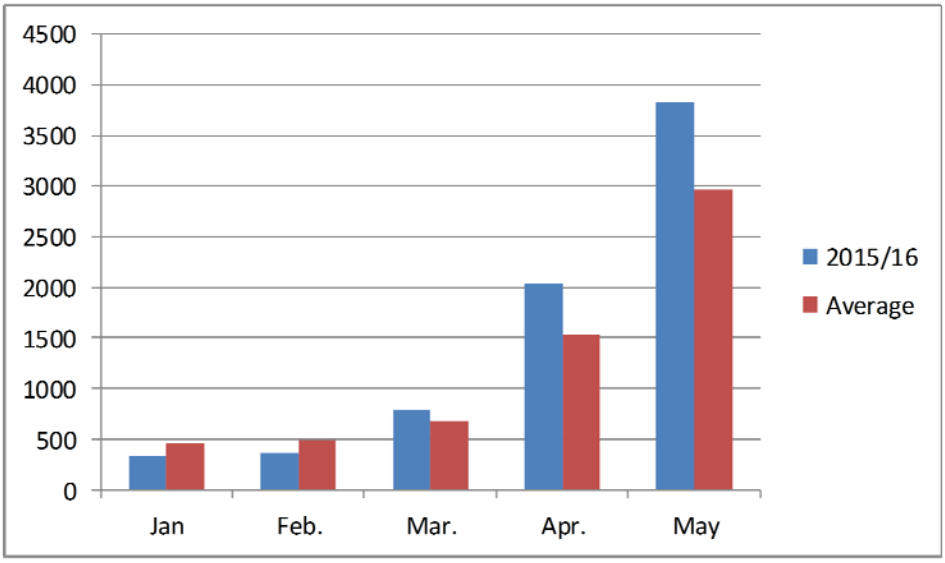

Figure 2 shows the average monthly and seasonal production at the UC Sierra Foothill Research and Extension Center near Marysville. The forage produced on a monthly basis last year was below the average for the months of January and February. The timely rains pushed up the forage total to about 129% of average. Locally we had significant June rains that resulted in explosive growth of yellow starthistle (Figure 3).

**Figure 3** 2016 Yellow starthistle production-inside the fence treated with Transline in Fall 2015

For more information, associated with managing yellow starthistle and medusahead on rangeland see articles in this newsletter.

As we consider this season's annual grassland production, the residue from the previous forage year (2015/16) resulted at least a great start to the grass season locally. The rainfall to date has alleviated much of the chronic stockwater shortage ranchers have faced the past five years.

Work with your local FSA to keep your file updated (new leases, etc). Take the time to talk with the USDA-Farm Services Agency to apprise them of range and forage conditions and discuss your specific situation.

## Using a Cow to Plant Bur Clover

Josh Davy – UCCE Farm Advisor, Tehama-Butte-Glenn Counties

For many years the notion of feeding clover seed to cattle with the idea that they spread the seed across the field in little piles of fertilizer has been discussed. A trial was conducted at the Elk Flat Ranch to test this theory. A cow was placed in a pen and fed bur clover seed (a medic) that was mixed into a molasses grain mix. Seed was collected after it passed through the cow (FED) seed). Percent germination of the seed that passed through the cow was compared to the seed straight out of the sack (CONTROL). Ten seeds of each treatment were separately placed in a pot with four pots per treatment, totaling 40 seeds per treatment. The CONTROL seed germinated eight days earlier than the FED seed with a 90% germination. All of the CONTROL plants survived the duration of the test. The FED seeds had a 7.5% germination (3 out of 40), but two plants died soon after germination. Of the 40 FED seeds planted only 1 survived (2.5% survival).

The surviving test plant showed the same nodule formation as the control plants. This trial demonstrated a significant loss of germination in medic seed when fed through a cow. We are interested in repeating the trial with other varieties of clover.

# Grass Tetany

Larry Forero, UCCE Farm Advisor, Shasta-Trinity
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Good early season forage growth with a high moisture content can be ideal conditions for grass tetany. Cloudy, wet, windy days with daytime temperatures between 40 and 60 degrees F and soil temperatures below 50 degrees Fahrenheit are associated with a high incidence of this problem. This is particularly the type of season we are entering in to right now.

Grass tetany hasn't been much of a worry over the past few years. The multiyear drought in California has pushed this concern to the back burner. The pattern and amount of rainfall we have received this forage year may make it critical to evaluate our mineral supplementation program to assure cattle have adequate magnesium (Mg).

Grass tetany (sometimes called hypomagnesemic tetany) is typically seen in mature heavy-milking cows turned out on early spring grass. The demands of high milk production can result in low levels of Mg and Ca. Often times a dead cow is the first indication a producer has of the problem. Al Nueman (1977) notes affected cows may be in an excitable state with erect ears and may attack a person. They may be blind and if driven or roped often go down after becoming excited. Other symptoms include grinding of teeth, trembling and possibly deep coma followed by sudden death. Milder cases of grass tetany resemble milk fever. If you come across a dead animal and the ground is torn up from their legs and head thrashing around this can be indicative of grass tetany.

It is important to remember that Mg is associated with Calcium (Ca) and Phosphorous (P). Many of our rangeland soils are inherently deficient in calcium. Cattle that have low levels of Ca and P are at greater risk to grass tetany. Recent data has also suggested that sodium (salt) levels in general can have repercussions on the incidences of grass tetany, meaning regular consumption of the salt based mineral to maintain even sodium levels in very important.

Take the time to review your mineral label. Consider the mineral information from the following two labels (note: crude protein, crude fat, acid detergent fiber and vitamins are not included).

| Mineral | Product 1 | Product 2 |
|---|---|---|
| Calcium | 8% (min) | 9.5% (min) |
| Phosphorus | 2% (min) | 0.4 % (min) |
| Sodium | 15% (min) | N/A |
| Magnesium | 1% (min) | N/A |
| Potassium | 20% (min) | N/A |
| Copper | 2600 ppm (min) | 2206 ppm (min) |
| Zinc | 5580 ppm (min) | 4410 ppm (min) |
| Salt | 37%% (min) | 19.4% (min) |
| Iodine | 140 ppm (min) | N/A |
| Selenium | 130 ppm (min) | 45.1 ppm (min) |

Product 1 includes magnesium and product 2 does not. If product 2 is being fed, there is no Mg and all the magnesium needed by the animal must come from the forage they consume.

Cattle with blood Mg levels between 18 and 35 ppm are typically considered adequate. Most sampling of cattle in Shasta, Tehama, Glenn, and Colusa Counties have found that routinely supplemented cattle fit within the required reference range, but this is not always true. Additionally, although the herd average may be adequate, many individual animals may still be deficient. This is very concerning because these cattle are susceptible to grass tetany. If this is the case, it might be necessary to determine the level of mineral in the supplement, and/or to evaluate consumption. Most supplements are designed to have a standard consumption that can vary from 1 ounce to over a pound of consumption daily. There are 800 ounces in a 50 lb bag of mineral. Divide from 800 the number of days to consume the mineral and then by the number of cattle in the pasture to get a rough estimate of daily consumption in ounces.

If you are concerned about grass tetany, you and your veterinarian should collect blood (serum) samples now as we are quickly approaching the season of worry. Collect and process blood samples before you expect a problem. This is also a good opportunity to find out how well your copper and selenium supplementation is working. The simple act of running a subsample of cattle through the chute to collect samples may precipitate the condition if Mg and Ca levels are low. Table 1 depicts the optimal range of serum results to prevent grass tetany.

Table 1. Optimal serum levels of cattle trace element panel to avoid grass tetany.

| Element | Reference Range |
|---|---|
| Magnesium | 18-35 ppm |
| Calcium | 80-150 ppm |
| Phosphorus | 45-60 |
| Sodium | 135-150 |

Measures that help prevent grass tetany include 1) extra Mg in their diet, 2) extra Ca in their diet and 3) additional salt (sodium chloride) intake. If you have a case of what you think might be grass tetany, work with your veterinarian to get an accurate diagnosis. Analytical tools for pinpointing this malady are much better than ten years ago. Your veterinarian can submit specific fluid samples to the California Animal Health and Food Safety lab (CAHFS) for diagnosis. If the diagnosis comes back positive, work with your veterinarian to develop a treatment and prevention plan to reduce that risk of further loss.

References: Nueman, A. L. 1977. Beef Cattle. John Wiley and Sons. New York
Maas, John. 2005. Will this be a Bad Year for Grass Tetany. California Cattlemen's Magazine.

# Medusahead Seed Suppression with Milestone Herbicide

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Guy Kyser – UC Davis Specialist
Joseph DiTomaso – Cooperative Extension Weed Specialist
Matthew Rinella – USDA ARS
Grace Woodmansee- UCCE Intern

Medusahead (Taeniatherum caput-medus*ae*) is an invasive annual grass that plagues California rangelands. Control of this grass is a challenge, in part due difficulty in selectively targeting a single grass in a grassland environment, and also because the economic return on investment for control can be questionable. A previous newsletter article reported on research in Northern California that found successful management of medusahead with an application of 14 oz/acre of Milestone (aminopyralid) prior to germination, and suppression with 7 oz/acre. However, this treatment is not effective after germination. Another downside to this treatment is that the high rates necessary for management can be expensive and the highest rate of 14 oz/acre is only registered as a spot spray.

Trials by Dr. Matt Rinella with USDA-ARS may have found an alternative lower cost option for medusahead suppression. In greenhouse studies, Dr. Rinella found a reduction in medusahead's ability to produce seed by applying Milestone during the boot stage of production with much lower rates, making it more cost effective. This is important because most medusahead seeds germinate within a year of production, so any method that prevents seed production can drastically reduce the weed population. Working with Dr. Rinella, we established field trials in Northern California to test the efficacy of this method for medusahead control.

*Medusahead in the boot stage of production, the ideal time to spray*

The field trials tested the effects of Milestone on grass seed production at rates of 3, 7, and 14 oz/acre applied during the boot stage. The boot stage occurs just prior to the seedhead emerging. In our local trial in Red Bluff, spring germination tests found all three treatments were equal in drastically reducing medusahead seed production from over 80% viable seeds to less than 10%. It is important to note that the treatments did not kill the plants, but rather inhibited them from producing viable seed.

The following season medusahead cover was monitored (Table 1) and corresponded to the reduction in seed production with the control having 40% medusahead and the three treatments ranging from 2-9%. None of the three treatments were statistically different from each other, but all were statistically less than the untreated control.

## RATE IS CRITICAL

The higher rates of Milestone (7 and 14 oz/acre) impacted medusahead similarly, but had increased negative effects on soft brome (chess) and annual ryegrass. All treatment rates had some negative impacts on soft brome germination, but the 3 oz/acre treatment had much less. Twice the amount of soft brome was found in the 3 oz/acre treatment group than the 7 and 14 oz/acre treatment groups. Even with some negative impact, all the Milestone treatments were significantly higher in soft brome when compared to the control because of reduced medusahead competition. If the desirable grass seed bank is depleted due to heavy medusahead invasion, It may be beneficial to reseed with desirable annual grasses to avoid large areas of bare ground.

## TIMING IS CRITICAL

The timing of Milestone application is critical. Targeting medusahead during the boot stage is key to reducing plant populations for the following year. The boot stage of plant growth occurs just before seedhead emergence. Far lower success in medusahead seed suppression would occur if the application timing occurred at or after heading.

## DUAL WEED CONTROL

Another advantage of this type of herbicide application is the possibility for suppressing both medusahead and starthistle at the same time. Although the timing referenced for medusahead control is late for commonly applied starthistle control with Milestone, it would still likely be successful in controlling plants as they would only be entering the bolting phase. The downside of a late application of Milestone for starthistle is that the flush of annual grass growth due to the lack of water competition with starthistle would not be realized in the current growing season compared to what it would be with an earlier application.

Table 1. Medusahead cover in late spring one year after application at two sites (%)

| Sites | Untreated | 3 oz Milestone | 7 oz Milestone | 14 oz Milestone |
|---|---|---|---|---|
| Red Bluff | 40 | 9 | 5 | 2 |
| Brown's Valley | 9.7 | 1.4 | 3.75 | 0 |

**Methods of Selenium Supplementation for Beef Cattle and Associated Weight Gains**

Josh Davy – UC Farm Advisor, Tehama, Glenn, Colusa
Larry Forero – UC Farm Advisor, Shasta, Trinity

Selenium (Se) deficiency in California livestock species is widespread, having been estimated to exist in over of 60% of herds in the state. Selenium is an essential nutrient for all animals including cattle. The importance of correcting Se deficiencies is well documented. Adequate Se levels have been found to booster immunity, resulting in a reduction of mortality and diarrhea, while increasing disease resistance in cattle. Two trials were completed to determine how commonly used Se supplement products corrected Se deficiency and monitored the resulting weight gains in yearling cattle.

The first trial included 80 head with 20 steers in four treatments of:
1) 3 cc of a 5 mg/ml injection of sodium selenite (15 mg Se/head, Muse)
2) 5 cc injection of a 5 mg/ml sodium selenite in a mixture of zinc oxide, manganese carbonate, and copper carbonate (25 mg Se/head, Multimin)
3) Se oral bolus[3] designed to release not more than 3 mg/head/day
4) Control

The cattle in the first trial were weighed every 30 days for 90 days and sampled for whole blood Se at day 30 and 90. Sampling 30 days after initiating the treatments (Figure 1) all of the Se treatments had increased Se whole blood levels on a herd average to within an adequate range of 0.08 ppm. However, at 90 days after treatment only the Se bolus managed to maintain levels at or above the adequate level.

The second trial built on the first one by testing the ability of a salt based supplement with 120 ppm of Se to raise whole blood levels of cattle (48 hd treatment 1). A small subset of cattle were separated as a positive control with a bolus (6 hd treatment 2) and a true control with no treatments (6 hd treatment 3) so any relationships between Se levels and cattle weight gain could be determined. All cattle (60 head) were weighed and whole blood Se samples were collected every 21 days for 85 days.

In both trials the control cattle started and remained deficient in Se, and the bolus treated cattle reached adequate levels rapidly and remained adequate (minimum 0.08 ppm). The salt supplement successfully in raised Se levels within the first 21 days, but took 90 days for average blood levels to reach the acceptable reference range. (Figure 2).

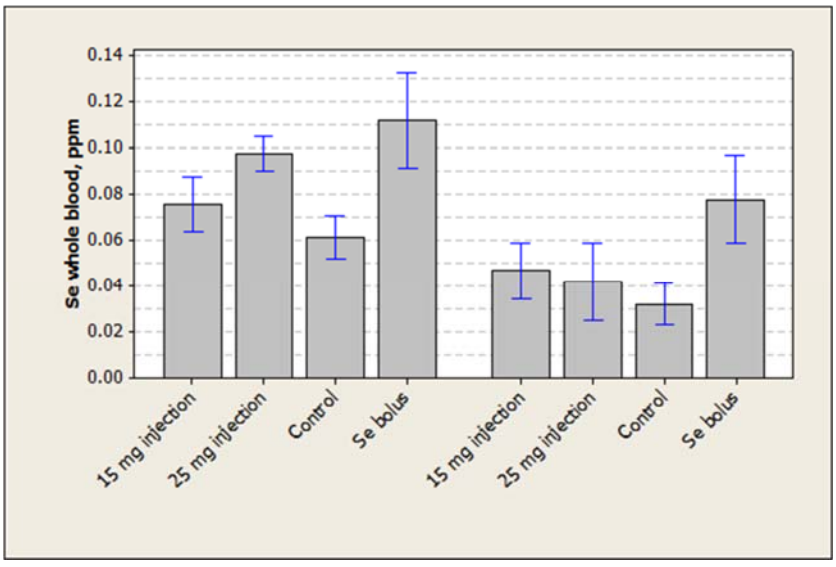



Figure 1. Selenium whole blood levels (ppm) based on treatment and sample date for trial 1. Adequate is considered 0.08 ppm

[1]Muse injection, Merck Animal Health
[2]Multimin 90 injection, Multimin USA
[3]Pacific Trace Mineral

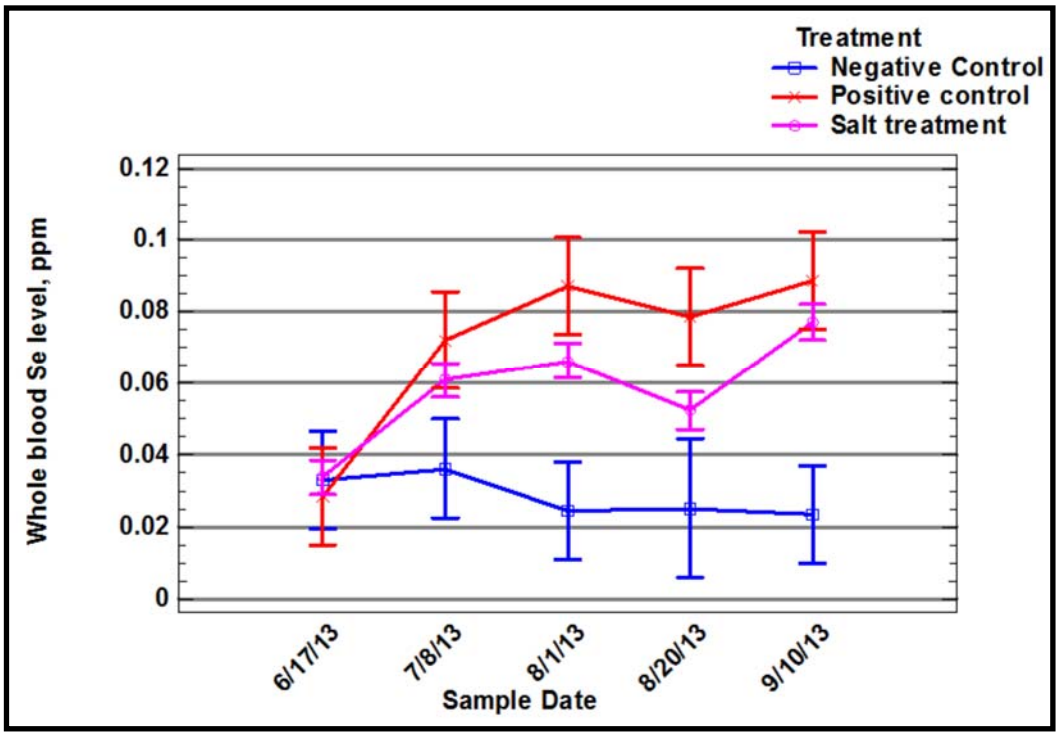



Figure 2. Whole blood selenium response by treatment and date for trial 2. Adequate is considered 0.08 ppm

**Correcting Se deficiency**

Consistent with other studies, data from this trial showed the rumen bolus method of supplementation appears to be a very effective method of Se supplementation.

Se injections do elevate Se levels. In this trial Multimin provided significantly higher whole blood Se levels than Muse at 30 days post treatment. This is a function of the injection dose (Multimin, 25 ml, Muse 15 ml). During the first 30 days Multimin provided Se at levels similar to the Se bolus. However, blood levels for all injectable products fell below the acceptable reference range (0.08 ppm). Similar to results from other studies, this data suggest a Se injection should not be expected to provide long term supplemental benefit. Using an injectable Se product can be a practical consideration when combined with an appropriate mineral supplementation program.

The greatest benefit of a salt based supplement is that it allows multiple minerals to be supplemented at the same time. This second, salt-mineral trial shows cattle reach an adequate level of selenium using this supplementation method. The difference between this method and the others (injectable product and boluses) is that it takes a longer time period to bring deficient cattle to adequate levels. The supplementation treatment did increase whole blood Se levels soon after the supplement was placed into the treatment pasture, but remained at a marginally deficient level until the final sampling (day 85).

Whole blood selenium levels corresponded to consumption of the loose mineral supplement. Intake levels were high when the supplement was first placed in the pasture (Table 1). At 5.6 ounces per head per day (oz/hd/d) consumption, the corresponding Se intake was 19 milligrams per head per day (mg/hd/d), which is similar to levels administered through Se injection. With Se intake of 9 and then 8 mg/hd/d average whole blood Se levels remained the same and then declined. Yet again, when the herd average consumption increased (15 mg/hd/d) the corresponding Se whole blood levels again increased significantly. This data indicates the importance of continued consumption of the supplement in known deficient areas. Seasonal supplementation (i.e., during the breeding season) does not appear to be a method to adequately maintain Se levels.

| Sample dates | Loose salt consumed, oz/head/day | Actual Se consumed, mg/head/day | Herd average Se blood level, ppm |
|---|---|---|---|
| 7/10/2013 | 5.63 | 19 | 0.06 |
| 8/1/2013 | 2.76 | 9 | 0.07 |
| 8/20/2013 | 2.26 | 8 | 0.05 |
| 9/10/2013 | 4.43 | 15 | 0.08 |

Table 1. Period average consumption of the loose salt mineral and associated Se uptake of the whole herd

While the average mineral levels for a group of cattle provides good general information, it is important to review the individual data carefully to make sure all the mineral blood levels for all the cattle fall within the acceptable reference range. Table 2 depicts the percentage of the salt treatment cattle that were still deficient or severely deficient as compared to the herd average Se level at each sampling. Surprisingly all treatments were similar in this effect. Though the salt treatment reduced the percentage of cattle that were severely deficient, 21% of cattle that were severely deficient while the herd average was adequate. Even the bolus, which was considered a reliable long term treatment, left 23% and 17% of animals severely deficient in trials one and two, respectively. Combining supplementation methods may decrease the overall number of deficient cattle. This may include practices such as administering Se injections at the beginning of the supplementation period and then providing salt supplement as a means to maintain Se levels.

| Date | Average Se blood level, ppm | % below 0.08 ppm | % below 0.05 ppm |
|---|---|---|---|
| 6/17/13 | 0.03 | 100% | 88% |
| 7/8/13 | 0.06 | 73% | 33% |
| 8/1/13 | 0.07 | 69% | 29% |
| 8/20/13 | 0.05 | 88% | 58% |
| 9/10/13 | 0.08 | 54% | 21% |

Table 2. Average herd whole blood level and corresponding percentage of cattle below adequate and severely deficient in the salt supplemented group of trial 2.

**The Influence of Se on weight gain**

Surprisingly, weight gain is not a function of Se whole blood level. Both trials had significant variance in animal Se levels and neither significantly attributed nor correlated with gain differences based on Se blood levels. This does not infer that correction of low Se levels is not important. Previous Se supplementation studies have found significant increases in immune response in calves, antibodies in yearling cattle, and vaccine antibody response. It appears that Se may not directly influence weight gain as do factors such as energy (TDN) in a ration, but rather indirectly with factors such as health. Reductions in weight gain may only be noticed in Se deficient cattle that experience some sort of immune challenge, which secondarily reduces weight gain. The possibilities for this type of challenge could be numerous including parasite and disease infections which are common to beef cattle. It is likely in these two trials these challenges were minimal as a function of ranch management (deworming and vaccination program, limited exposure to outside cattle, etc). However, it is reasonable to assume that at some time an immune challenge would occur resulting in any number of animal health problems of a Se deficient group of cattle.

# Comparing Transline and Milestone Herbicides

Josh Davy – UCCE Farm Advisor, Tehama-Glenn-Colusa
Joe DiTomaso – UCCE Weed Specialist
Larry Forero – UCCE Farm Advisor, Shasta-Trinity

Transline (clopyralid) and Milestone (aminopyralid) are herbicides registered for use in rangeland, pasture, wildlands, and rights-of-way to control broadleaf plants, especially thistles. Both control some important Sacramento Valley weeds such as yellow starthistle, Italian thistle, milk thistle, and artichoke thistle. They will kill emerged thistles (postemergent control) and provide season long suppression of thistles that germinate after application (preemergent control). Yellow starthistle can germinate in the Sacramento Valley from October to May, so early applications (December-March in the Sacramento Valley, April in the mountains) of each herbicide can provide season long control. Properly timed applications to control yellow starthistle should be made before yellow starthistle bolts or before annual grasses exceed four to six inches in height. Research has shown that the earlier the application, the more grass that is produced on the site.

An acceptable rate for the control of most thistles with Milestone is 3 to 5 ounces per acre and for Transline is 4 to 11 ounces per acre (DiTomaso et al. 2013). The very low amount of material required per acre and the limited movement of the product from the application point has allowed them to be registered under the Reduced Risk Pesticide Initiative of the U.S. Environmental Protection Agency and eliminates grazing restrictions in the treated areas for beef cattle.

Research conducted from 2000 to 2006 on rangeland sites in California by UC Weed Specialist Joe DiTomaso found that as low as 2 oz/acre of Milestone and 3 oz/acre of Transline controlled yellow starthistle when applied in very early March, though these rates are below the lowest rate on the herbicide label. The trials demonstrate the effectiveness of both herbicides in controlling yellow starthistle.

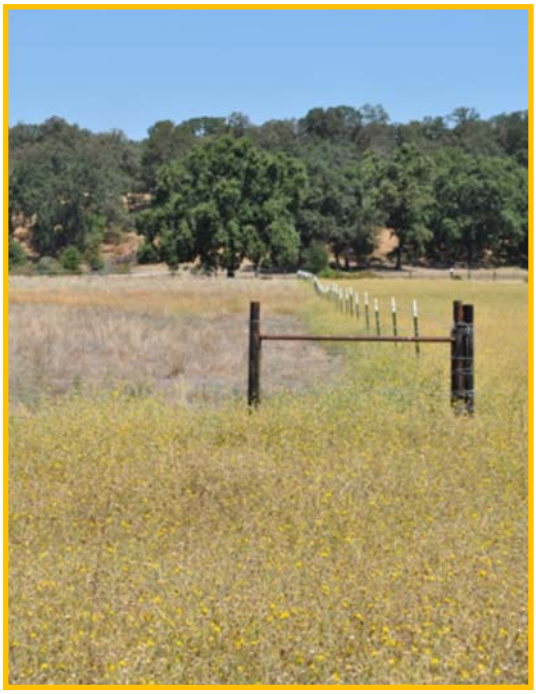
Both herbicides are made by Dow AgroSciences, which creates confusion why the same company would market two similar products. The answer is that each product has particular circumstances where they would be most useful (Table 1). In general, Milestone has a broader control spectrum than Transline. The most notable plants controlled by Milestone, but **not** by Transline, are fiddleneck and filaree. If filaree is desired, Transline should be the product chosen. If the additional control of fiddleneck is a goal, Milestone would be a better option. Although Milestone has a higher cost per ounce, the lower rate applied makes cost between the two products fairly comparable.

Table 1. General comparison of Transline and Milestone

| | Herbicide | |
|---|---|---|
| | Transline | Milestone |
| Cost/oz | $1.75 | $2.85 |
| Rates for YST (oz/acre) | 4-11 (8) | 3-5 (4) |
| YST application timing (Sac. Valley) | Dec-March | Dec.-March |
| Filaree control | No | Yes |
| Fiddleneck control | No | Yes |
| Preemergent control of medusahead | No | Yes |
| Seed suppression of medusahead | No | Yes |
| Grazing restriction | No | No |

In cases where low rates are applied to control small thistles, Transline is a lower cost option.

In addition, if Milestone is sprayed as grasses are beginning to mature (boot stage, but not heading) it can inhibit grass seed production even at low rates, which may be of benefit in some situations. If applied at high rates (14 oz/acre, spot spray), Milestone can also prevent medusahead and other grass (not ryegrass) germination if applied prior to fall rains. Neither herbicide affects grasses when sprayed during their vegetative stages.



Milestone may also be harder than Transline on trees if applied over the canopy, but both are considered safe if sprayed under the canopy of non-legume trees. Both will have detrimental effects to woody legumes, such as red bud, and will kill clover and other herbaceous legumes. Neither herbicide will harm mustards.

Photo 1. Area inside the fence line treated with Transline shows complete yellow starthistle control as compared to outside the fence line, which was not treated.

When herbicides are used, it is critical to read and follow all label instructions—understanding the label improves efficacy and assures the product is being applied safely. When pesticides are applied to commercial production pastures, use reports are required. Some products require a restricted materials permit where others only require an operator ID (see Table 2). If you have any questions about this—call your local agriculture commissioner's office.

| Product | Operator ID | Restricted Material Permit | Notice of Intent | Use Report |
|---|---|---|---|---|
| Milestone® | Yes | No | No | Yes |
| Transline | Yes | No | No | Yes |

Table 2. Summary of the regulatory and reporting requirements for products outlined above

Reference: DiTomaso JM, GB Kyser et al. 2013. Weed Control in Natural Areas in the Western United States. Weed Research and Information Center, University of California, Davis. 544 pp.

[1]Mileston/Transline Yellow starthistle management
[2]Medusahead
[3]Mineral Supplention

Norther California Ranch Update is a newsletter published by the Shasta County Farm Advisor's office containing research, news, information and meeting notices related to the areas of livestock production, irrigated pasture, range and natural resource management.

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**Ranch to Rail Program**

Larry Forero and Josh Davy

The UC Davis Animal Science Department, UC Cooperative Extension and California Beef Cattle Improvement Association continue to support an educational program to help improve California beef cattle producers' understanding of feeding performance and carcass attributes of their cattle. The program encourages participation from producers throughout the state. The data collected will help participating producers and will be summarized to provide benchmarks for the California beef industry.

The campus feedlot is in constant need of livestock to support teaching and research throughout the year. With the Ranch to Rail project, we are able to purchase 10-15 feeder steers from interested cattle producers in the state. Feedlot performance, economic and carcass data is collected, compiled, and then provided back to the producer by project leaders and your local UCCE Farm Advisors. Participants are able to use this data to improve breeding and management decisions. If you are interested in participating in this program contact Larry Forero (530-224-4900) or Josh Davy(530-527-3101) for more information.