Southeastern Arizona Range and Livestock News April 2016

THE UNIVERSITY OF ARIZONA
COLLEGE OF AGRICULTURE AND LIFE SCIENCES
COOPERATIVE EXTENSION

Serving Cochise, Graham, Greenlee, Pima, and Santa Cruz Counties

Featured Plant: Whorled Milkweed

There are about 30 species of milkweed found in Arizona. Two of the most toxic milkweeds in the western United States are of concern to livestock producers in Arizona: Whorled milkweed, *Asclepias verticillata* and Horsetail milkweed, *A. subverticillata*. These milkweeds occur throughout the state at elevations from 2,500-8,000 feet. They grow in a variety of rangeland settings from dry to moist soils, as well as weeds in cultivated fields and along roadsides.

Milkweeds get their name from the milky sap that is released when plant parts are broken. Whorled and Horsetail milkweeds are perennial forbs with creeping rhizomes. Long, narrow leaves are arranged in a whorl around the stem. The flowers are greenish-white to cream color and grouped in dense, umbrella-like heads at the tops of flowering stems. The majority of growth occurs in late spring and early summer.

All classes of livestock are susceptible to milkweed poisoning. Milkweeds are poisonous at all stages of growth and even when dry in baled hay. They contain toxic glycosides and resins. As little as 0.2% of body weight consumed in green plant material can be lethal.

Some of the signs of poisoning include: depression, weakness, difficulty in breathing, dilation of pupils, rapid, weak pulse, bloating, and respiratory paralysis. Signs of poisoning occur within a few hours and livestock may die soon after or within a couple of days.

Animals usually do not eat milkweeds as they are not highly palatable. Poisoning can occur when there is a scarcity of good forage. Animals should be removed from pastures with high densities of milkweed and poor forage conditions. Hay contaminated with milkweed should not be fed to animals. Although milkweeds are susceptible to certain herbicides, preventing animals from consuming milkweed is the most effective way to reduce losses.

Line Drawing Credit: USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols.* Charles Scribner's Sons, New York. Vol. 3: 32.

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USDA Agricultural Research Service. 2006. *Poisonous Plant Research: Milkweed*. http:www.ars.usda.gov/Research/docs.htm?docid=9955. Accessed 3/25/2016.

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Blackleg and Malignant Edema in Cattle

Blackleg and Malignant Edema are two diseases affecting cattle and other warm-blooded species. They are caused by bacteria in the genus *Clostridium.* Clostridia are rod shaped bacteria that will not grow in oxygenated environments (obligate anaerobes). They form microscopic spores which enable them to survive in inhospitable environments such as extreme heat, dry conditions, UV radiation (sunlight), and attempts at disinfection. Once these spores reach a suitable, oxygen depleted environment they activate and return to their bacterial (vegetative) state. Clostridia organisms can be found normally in the soil and in the digestive tract of healthy animals. Their prevalence and ability to survive even in dry, hot soil makes them a regular threat to livestock. These diseases progress very rapidly; often the only indication of blackleg or malignant edema in the herd is the sudden death of one or more apparently healthy animals.

Blackleg is caused by the bacteria *Clostridium chauvoei*. Young, growing animals (6 months to 2 years) are most susceptible to infection, often picking the bacterial spores up in the soil. The spores can cross from the digestive tract to the bloodstream where they are deposited in tissue throughout the body. Once they find a suitable oxygen depleted site they become active and begin causing disease which progresses rapidly. Treatment is not typically possible; death occurs in 12-48 hours. Signs of infection that may be noted include lameness with a fever and depressed appetite progressing to a characteristic gaseous swelling in the upper leg, hip, shoulder, neck, or elsewhere. Dead animals will have significant swelling of affected muscle tissue with gas accumulation under the skin. Affected muscles will also have areas of black, necrotic tissue with a foul odor.

Malignant Edema is caused by *Clostridium septicum*. *C. septicum* is normally found in the intestinal tract of most livestock. It is shed in the feces and can infect healthy tissue through contamination of an open wound such as a cut or castration site. The bacterial infection causes local fluid accumulation (edema) and swelling, typically near a wound, along with fever and depressed appetite. The affected tissue in deceased animals will be darkly discolored with a necrotic odor but will lack the gas accumulation associated with blackleg. Treatment with penicillin is effective only if started very early in disease onset; animals that survive are often disfigured. Death typically occurs in 24-48 hours.

The fast acting nature and prevalence of these diseases makes timely diagnosis and treatment extremely unlikely. Vaccination with a 7 or 8-way clostridial vaccine is effective and recommended to prevent infection. Typically, these vaccinations will protect against *Clostridium chauveoi* (black leg), *Clostridium septicum* and *Clostridium sordelli* (malignant edema) as well as several other disease-causing Clostridia organisms such as *Clostridium novyi* (black disease), *Clostridium tetani* (tetanus), and several types of *Clostridium perfringens* (enterotoxemia). Follow label instructions and consult your veterinarian to ensure your cattle and calves are properly protected.

Powell, J. Blackleg and Other Clostridial Diseases: University of Arkansas Cooperative Extension Service. FSA3073.

Songer, Glenn, 1993 Blackleg and Malignant Edema Control, in R. Gum, G. Ruyle, and R. Rice, eds., Arizona Ranchers' Management Guide, Arizona Cooperative Extension, p. 15-18.

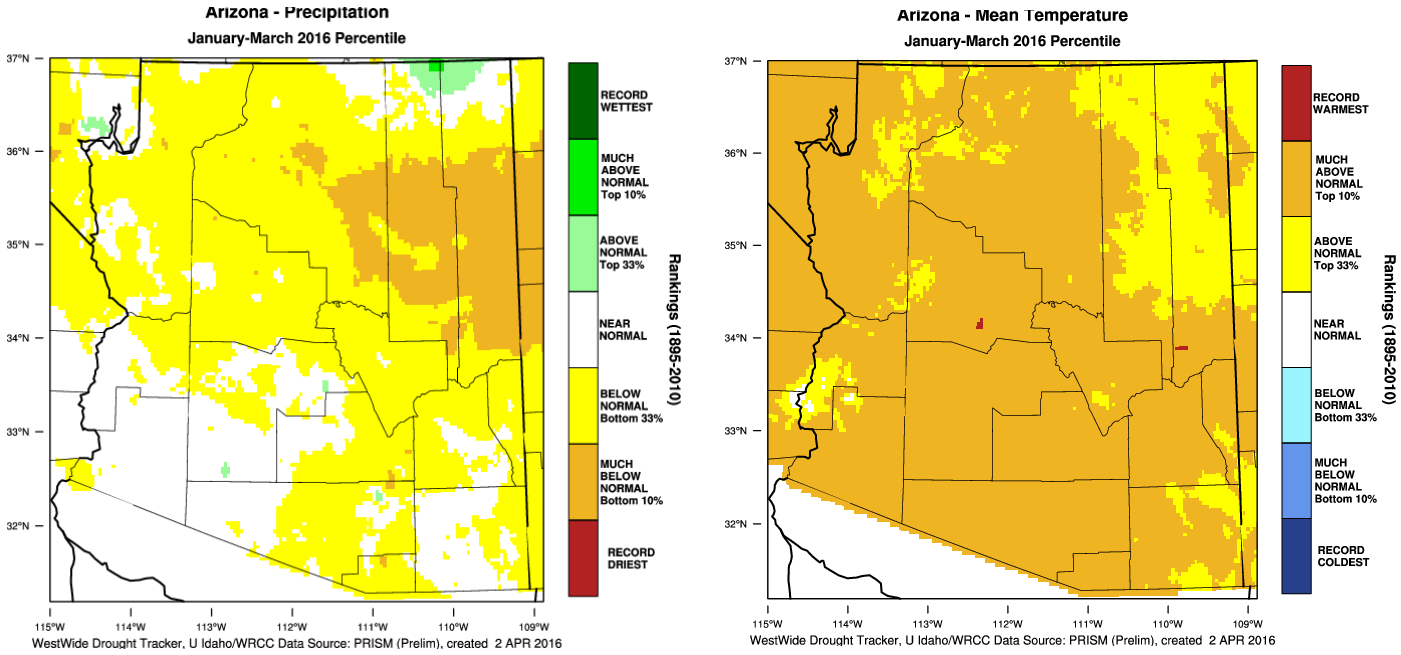
This illustration depicts a photomicrographic view of a Gram-stained culture specimen revealing the presence of numerous Gram-positive *Clostridium chauvoei*, formerly known as *Clostridium feseri*, bacteria and bacterial endospores.

Photo Source: CDC Public Health Image Library, http://phil.cdc.gov/phil/details.asp

Southeast Arizona Seasonal Climate Summary: Early Spring 2016

April 4, 2016 - January started off with a great deal of promise as a series of El Niño fueled storms tracked across the region the first week of the month. Several inches of rain fell across valley locations (widespread reports of 1-3 inches between Jan 1st-10th) and several feet of snow accumulated in the mountains over this period. A strong and southward displaced jet stream steered, very typical of El Niño conditions, steered this parade of storms across the Southwest. Given that strong El Nino conditions have been in place since the fall, it was expected that several more of these wet spells would occur across southern Arizona through the Jan-March period as has been the case in past strong events (e.g. spring of 1983 and 1998). Instead, the remainder of this is early spring period was more like late spring/ early summer with near record dry conditions and unusually warm temperatures. Instead of the expected active and wet storm track a warm and dry ridge of high pressure dominated the weather of southeastern Arizona with only two storm events of any consequence able to sneak precipitation into the region over this period, one in early February and one again in mid-March. This almost complete lack of precipitation and unusually warm temperatures over the past two months has helped short-term drought conditions creep back into southeast Arizona.

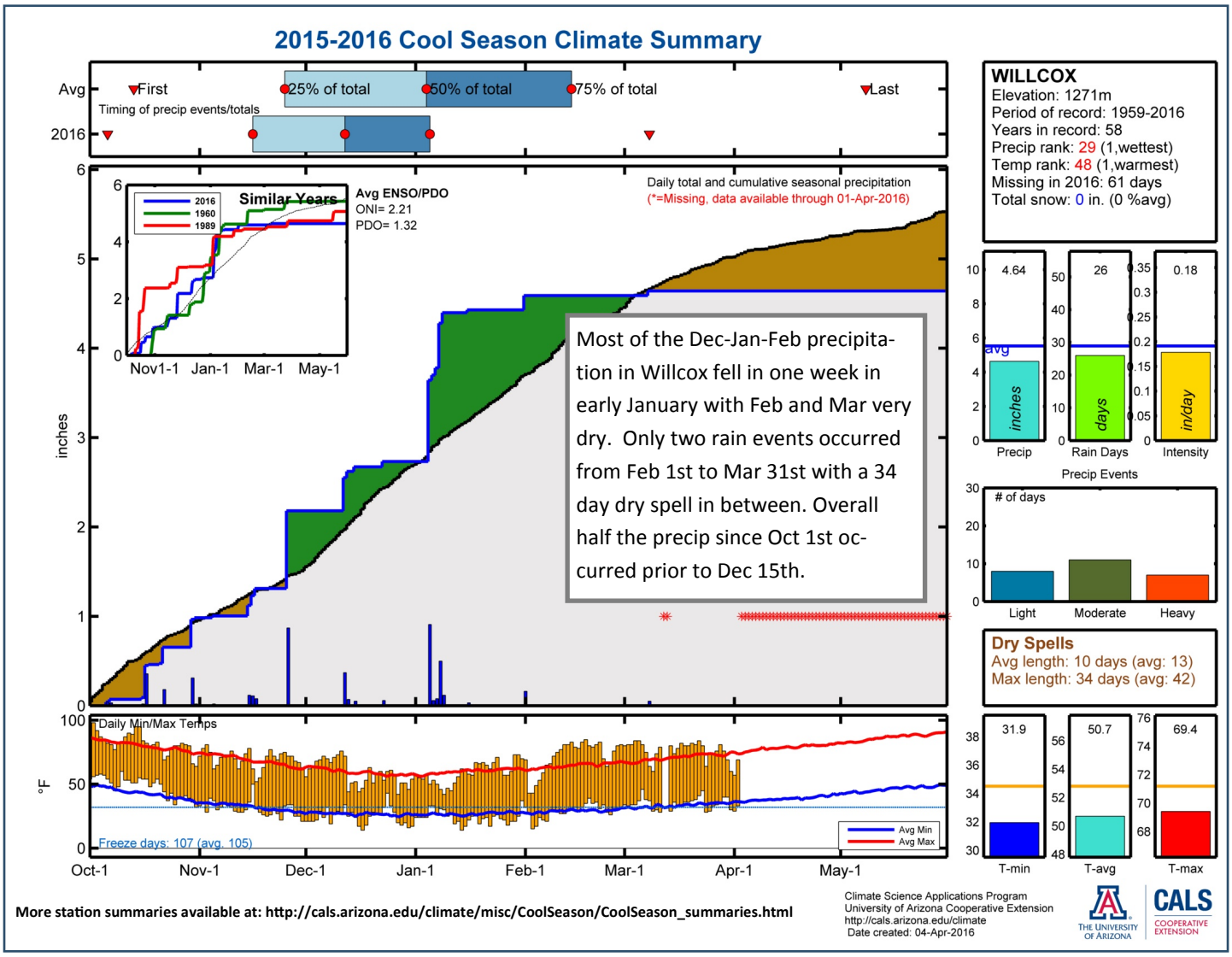
The current strong El Niño event has peaked, but may still influence weather through the spring and possibly redeem itself a bit by steering some storms into the region through April and early May. A shift to La Niña conditions may also be underway, but its impact on the upcoming summer monsoon season is unclear at this point.



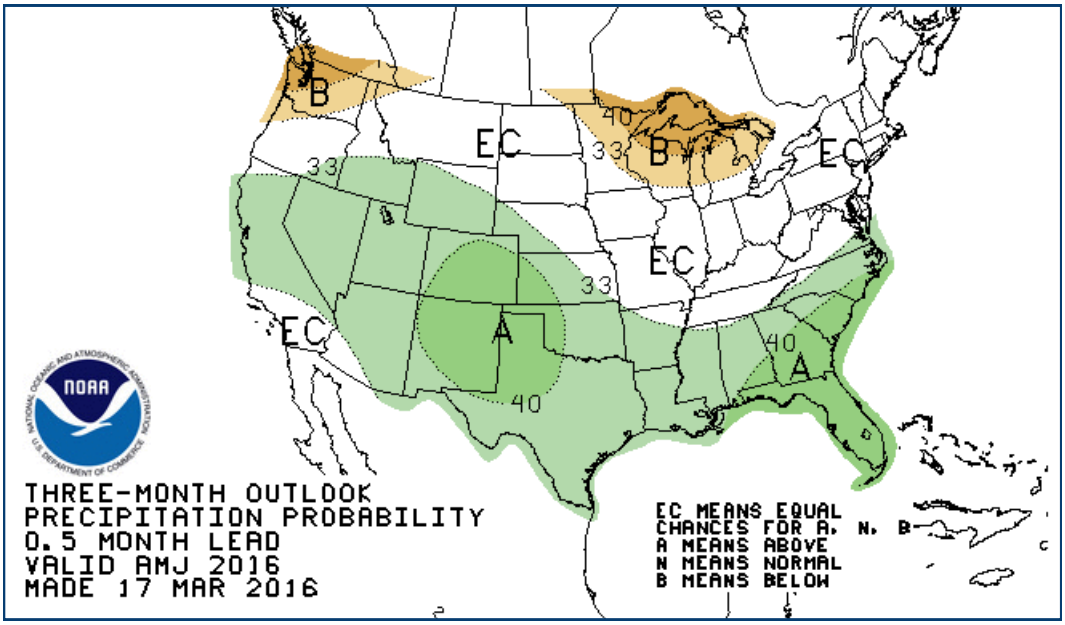
October– December precipitation and temperature rankings from the WestWide Drought Tracker

(http://www.wrcc.dri.edu/wwdt/)

More information available at :
http://cals.arizona.edu/climate
http://www.climas.arizona.edu
Questions /comments? Contact Mike Crimmins, crimmins@email.arizona.edu



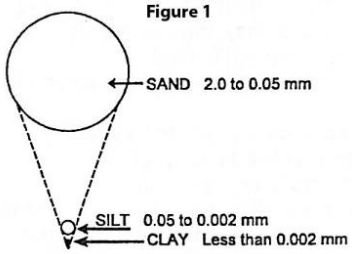
The April-May-June seasonal precipitation outlook issued by the NOAA Climate Prediction Center on March 17th, 2016 continues to depict an increased chance of seeing above-average total precipitation over the upcoming 3-month period. This outlook only shows a slight shift in odds for above-average precipitation across Arizona indicating the low certainty in this outcome. The current El Nino event has failed to bring typical impacts to the southwest U.S. this year leading to higher than average uncertainty through the rest of the spring season as it continues to weaken. This is also an increasingly dry period meaning that above-average precipitation translates into very small amounts overall. Model uncertainty for the upcoming summer monsoon season is also very high and isn't offering any useful insights at this point into potentially wet or dry conditions developing.



Understanding Soils Part 2: Physical Properties of Soil

The physical properties of soil help determine, to a large extent, how best a soil can be used by homebuilders, farmers, ranchers, and gardeners. A soil's physical properties are those factors which can be seen and felt.

Figure 1

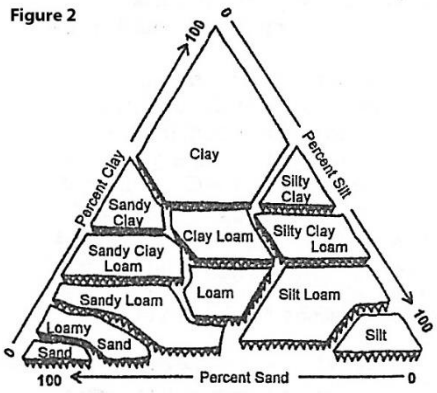


Relative size of soil particles.

Soil texture refers to the relative proportion of sand, silt and clay particles in a soil. Sand particles are quite large and have a gritty feeling. Silt particles are much smaller than sand and feel smooth when wet. Clay particles are very small and feel sticky when wet. The relative size of soil particles is illustrated in Fig. 1.

Soil texture affects how much water runs off or soaks into a soil when it rains, how much moisture a soil can hold, and how much moisture a plant can get from the soil. Twelve soil texture classes are recognized. The texture triangle (Fig. 2) indicates the relative proportion of sand, silt and clay in a textural class.

Figure 2



Soil texture triangle.

Different soil textures have different available water capacities. This is the amount of water a soil can hold that is available to plants. Water moves into and through finer textured soils slower than a soil which is coarser textured. Soil texture classes such as sand, loamy sand and sandy loam soils have coarse soil particles and a limited ability to hold water for plant growth. Textural classes containing mainly clay and silt size particles possess a greater ability to hold water in the soil profile. Fine-textured soils, clay and clay loams, swell when wet and shrink while drying. This causes cracking on the soil surface. With some types of clay, the shrink-swell movement is great enough to crack foundations or road beds built on the soil.

Soils are often referred to as coarse, medium and fine textured. In general, the finer the texture:

- the more difficult a soil is to work or till,
- the greater the water holding capacity,
- the slower water will enter and move through the soil profile,
- the more difficult for roots to penetrate, and
- the more readily the surface soil will crust.

Soil structure refers to the way individual soil particles are grouped together to form larger pieces of soil called structural groups, known as "peds" or "aggregates" (Table 1). Sandy and other loose soils which contain very little, if any, clay or organic matter to bind soil particles together may not show structure. They are typically single grained. Soils that have large lumps, no visible structure and are hard to break apart are usually fine-textured clay soils.

Kinds of soil structure.

Type		Description
Platy		Flat, thin plates lying horizontally in soil.
Prismatic		Columns vertical in soil may be several inches long and 1½ to 3" in diameter.
Blocky		Angular blocks ½ to 2" in diameter.
Granular or Crumb		Resembles crumbs or grains. Usually less than ¼" in diameter.
Loose Structureless Single grain		Soil particles do not stick together.
Compacted Structureless Massive		Soil in very large clods. No visible structure. Hard to break apart.

Table 1

The structure of soil horizons largely determines the ease with which plant roots can penetrate the soil. In addition, soil structure influences water absorption and movement in soil, ease with which soil can be tilled and resistance to wind and water erosion. Soils that have a granular structure in the A horizon and prismatic and/or blocky structure in the B horizon are ideal for air and water movement and plant root penetration.

From: Howery, L., K. McReynolds, S. Pater, and G. Ruyle. *Arizona Natural Resource Wonders*, 1999. The University of Arizona Cooperative Extension.

Culling and Marketing Cows

The decision to keep or cull a cow is influenced by many factors including her age, fertility, and market conditions. For the average cow-calf operation, 15-30% of yearly revenues come from cull cows. Many producers cull and sell in the late fall, soon after weaning. Spending some time considering when to cull and how best to market those cows can help impact a rancher's bottom line.

The culling decision should take into account a cow's potential fertility. Any cow with issues that compromise her ability to produce a live, weaned calf should be culled. An open cow with no physiological reason for not producing a calf may require a little extra consideration, especially in the less traditional spring and fall calving scenario. In a spring and fall calving operation, an open cow can be brought back into production six months earlier than in a spring only operation. This, coupled with the right market conditions (i.e. high replacement costs) may make keeping an open cow who still has potential to produce another live calf a more attractive option (Tronstad and Gum, 1993b).

Often the decision to cull is based strictly on if a cow is open or pregnant, but there is more to consider when deciding to keep or market a cow. Pregnant or not, her age should be factored into the decision. There is an increased probability of an older cow becoming crippled or dying before she can be marketed, reducing her salvage value to zero. Also consider that calf weaning weight maximizes when a cow reaches 7 years of age and declines after that. The difference in calf weaning weight between an older cow and a peak age cow could be as high as 15% (Tronstad et al., 1993). An older cow is also more likely to be a late season calver, contributing to lighter weaning weights.

The cost of replacing a culled cow is another important factor in the culling decision. Even if you raise your own replacement heifers the cost to purchase replacement animals should be used as your replacement cost. It may cost you less than that to raise them, but you need to account for the "opportunity cost" of lost profit. During seasons where slaughter prices are high and replacement costs low there is an opportunity to replace older, later calving cows with younger animals bred to calve earlier in the season. This could increase the total pounds of calf produced on the ranch and the cost of the replacement animals may be offset by the salvage price of the cull cows (Teichert, 2013).

Generally, cull cow market prices follow a seasonal pattern with higher prices in March, April, and May and lower prices in November, December, January (Tronstad and Gum, 1993a). A cow culled in the higher priced months or into the summer when prices are typically "average" might be marketed right away. Depending on feed prices and winter grass availability, cows culled in the fall could be held through the winter to take advantage of the higher spring prices.

Cull cow prices are based on their expected USDA carcass grades. Typically, cull cows grade, in order of least to most marbling: Canner, Cutter, Utility, or Commercial however young animals may grade Standard, Select, or Choice. Price differences between grades vary from year to year and impact cull cow prices.

A 1993 study at South Dakota State University fed and slaughtered cull cows after 0, 50, 77, and 105 days on feed. They received a high concentrate diet (75% corn, 15% corn silage on a dry matter basis) and gained 2.8, 3.0, and 3.1 pounds per day for each respective feeding period. From this trial, it appears that most cull cows fed a high concentrate diet for 60-100 days could expect to improve one USDA grade, and many could improve two. Cull cows fed a primarily roughage diet for 60-90 days had a much lower rate of gain, around 1.5 pounds per day when fed a ration of alfalfa-grass hay. Its unlikely cull cows would improve more than one USDA grade on this feeding program (Feuz, 1995).

Culling decisions and marketing options should be evaluated each culling cycle based on that year's cattle prices and feed prices or availability. Making correct culling decisions and maximizing the returns on culled cows can significantly contribute to the sustainability of the ranching operation.

Sources:

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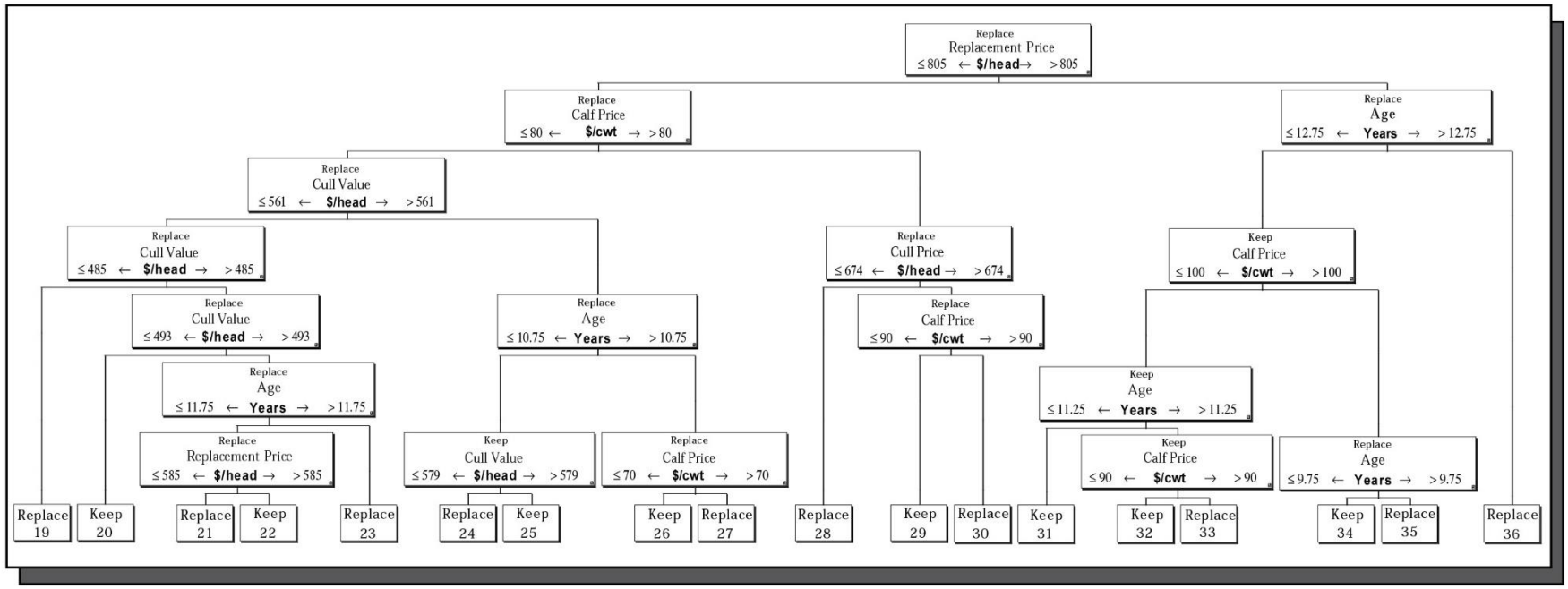
Teichert, B., 2013, Why Are Beef Producers So Afraid to Cull Cows?, Beef Magazine: www.beefmagazine.com.

Tronstad, R., and R. Gum, 1993a, Market Impacts on Culling Decisions *in* R. Gum, G. Ruyle, and R. Rice, eds., Arizona Ranchers' Management Guide, Arizona Cooperative Extension, p. 33-48.

Tronstad, R., and R. Gum, 1993b, Optimal Economic Range Cow Culling Decisions: Biological and Market Factors Combined, *in* R. Gum, G. Ruyle, and R. Rice, eds., Arizona Ranchers' Management Guide, Arizona Cooperative Extension p. 49-58.

Tronstad, R., R. Gum, D. Ray, and R. Rice, 1993 Range Cow Culling: Herd Performance, *in* R. Gum, G. Ruyle, and R. Rice, eds., Arizona Ranchers' Management Guide, Arizona Cooperative Extension, p. 27-32.

Decision Tree for Pregnant Cows in the Fall that are Older than 8.75 Years of Age when only Spring Calving is Possible.



Culling decision tree from *Arizona Ranchers' Guide.* Optimal Economic Range Cow Culling Decisions: Biological and Market Factors Combined (Russell Tronstad and Russell Gum, 1993). Find the entire guide as well as this article with more culling trees at:

https://ag.arizona.edu/arec/arizona-ranchers-management-guide

April 12 - Ranching into the Future Workshop: Funding Opportunities for Farmers and Ranchers, Safford. Contact Arizona Land & Water Trust, Scott Wilbor, swilbor@alwt.org

April 13 - Range Livestock Nutrition, Valley Telecom, Willcox – Contact Debbie Reed dlreed@email.arizona.edu

May 14 – SACPA Meeting (Rose Tree Ranch near Elgin) – Contact: sacpa@sacpaaz.org