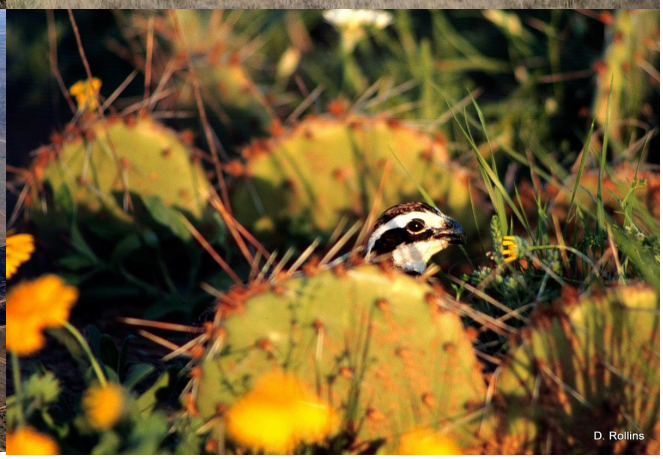
Fire Appreciation Day

May 24, 2016

.

Rolling Plains Quail Research Ranch



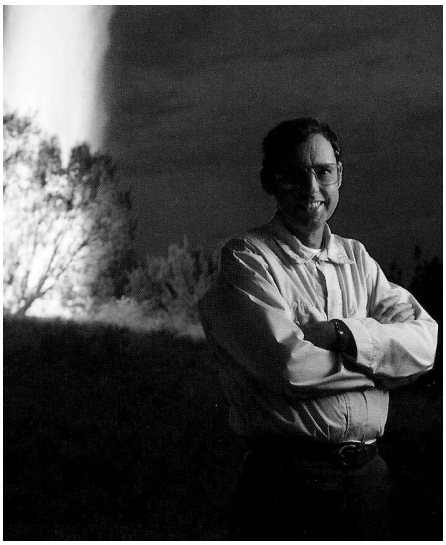
Acknowledgments

We thank our speakers for taking time to present today, and prepare written materials for your study. In addition to the authors on today's program we also thank M. Coffman, B. Hays, R. Linex, and J. Pluhar for their service on our steering committee.

We appreciate the financial support of the Grazing Lands Coalition (Texas & National), and the Rolling Plains Quail Research Ranch. On behalf of RPQRR, I appreciate the efforts of our staff, grad students, and summer interns. I also thank any and all volunteers who have helped with our burns since 2008. Dow Agrosciences provided herbicides for several of the studies noted herein.

Dedication

I dedicate this Fire Appreciation Day to the late Dr. Henry A. Wright, the "Father of Fire" in Texas. His legacy lives on in those of us who were fortunate enough to be empowered by him. — DR



"*If I have seen further than others it is because I was standing on the shoulders of giants*."
— Sir Isaac Newton

Welcome to RPQRR's
Fire Appreciation Day

Fellow Pyromanagers,

My preacher ("Preacher Paul") often cautions that "you're free to choose your actions but you're not free to choose the consequences." Such advice is topical today . . . in several contexts. Our rangelands might make the same argument!

Fire is a crescent-wrench for natural resource managers in west Texas—it can accomplish multiple objectives simultaneously, but it is not without the risk of "busting one's knuckles" (proverbially speaking). Our goal today is to showcase how we've used prescribed burning since the RPQRR's inception in 2007. We've enjoyed some successes, experienced some failures, and made note of some surprises. There is something to be learned from all of them.

We're pleased to include a strong list of partners for this field day. All of us have a common goal of promoting the proper use of fire in a safe, responsible manner.

Please take advantage of this time afield with our staff and cooperators in order to enhance your skill set relative to prescribed fire. And if you have observations about how we could be doing things better, or some off-the-wall ideas we haven't considered, we're all ears.

Indeed, education is a lifelong process.

For more information about RPQRR, see our website (www.quailresearch.org).

Schedule

8:30 Registration & Refreshments

9:00 Welcome & Opening Comments
Dr. Dale Rollins, Director
Registration ($10); complete CEU paperwork (Zac Wilcox)

Appreciating fire (D. Rollins)
Fire history in Southern Great Plains (Dr. Robin Verble, Texas Tech)

9:20 Depart for Tour

Stop 1 Doc Pasture
Planning/implementing a prescribed burn on RPQRR, Lloyd LaCoste
Fire weather (Matt McEwen, Southern Rolling Plains PBA)
Special considerations (Dr. Morgan Russell, Agrilife Extension)

Stop 2 Fire & prickly pear control (D. Rollins)
Season of burning
Fire w/wo herbicides
Prickly pear response
Forb & shrub response
Aerator with sprayer demo (Mark Moon)
Smaller unit for use with farm tractor (Chris Ellis)

Stop 3 Annie Pasture — Species responses to burning
Livestock (Kent Mills, Hi-Pro Feeds, Hermleigh)
Deer (Barrett Koennecke, TPWD)
Quail (D. Rollins)
Other consumers (arthropods, small mammals) (Brad Kubecka, RPQRR)

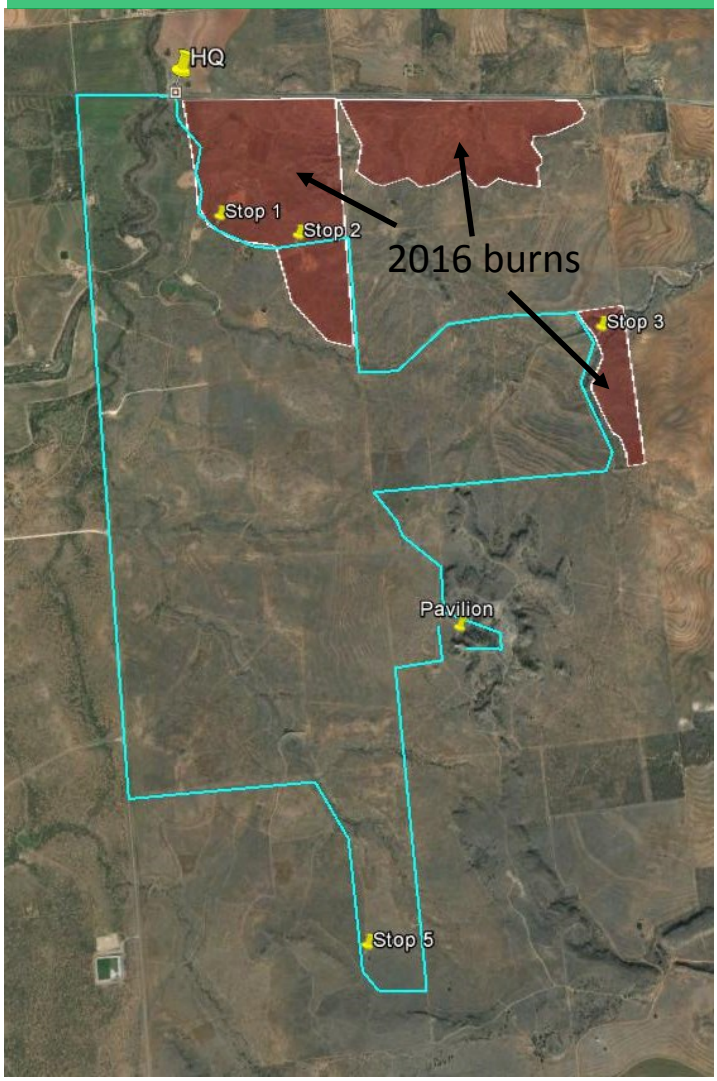
Noon: Stop 4 Pavilion — Lunch
Landowner experiences (Jim Cave, area rancher)
Technical assistance opportunities
SRPBBA (M. McEwen, Lubbock)
TPWD (Seth Pearson, Ralls)
NRCS (Ethan McJames, Abilene)
Certification and Continuing Education opportunities (R. Verble, Texas Tech Univ.)

Stop 5 Ellie Pasture—Conservation innovation with fire
Making cents of the science—Soil health considerations (M. Russell)
Patch-burn grazing (D. Rollins)
Some outside-the-box applications and observations (D. Rollins)
Embracing a fire culture in 2016 (M. Russell)

Administer evaluation

3:30 Return to HQ (Distribute CEU certificates)

Tour Route



Proceeds from today's field day will benefit the Southern Rolling Plains Prescribed Burn Association.

Appreciating fire

Dale Rollins, RPQRR, drollins@quailresearch.org

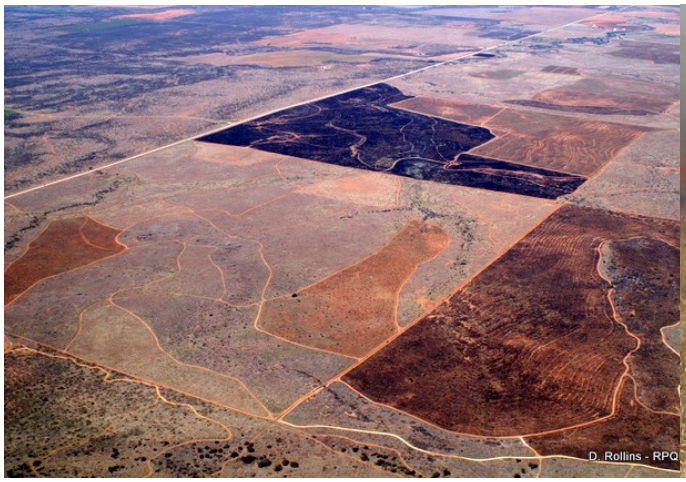
I've made a career out of "appreciating" things. Back in 1994, I held the first-ever "Predator Appreciation Day" — it (and several thereafter) were viewed with trepidation. Much like those that followed for "Brush Appreciation Days" and "Feral Hog Appreciation Days." When I began "Quail Appreciation Days" in 1998, folks thought I'd regained consciousness—finally something we could all "appreciate!"

I always stress the various contexts of the word "appreciate", including (a) value or admire highly, (b) judge with heightened perception, and (c) be cautiously or sensitively aware of. Aside from quail, I'm leaning on the last two definitions to defend various pariahs.

I'm a product of Texas Tech during the tenure of Dr. Henry Wright—a "pyromanager" from the get-go. Dr. Wright was "the man" for fanning the flames for prescribed burning in Texas . . . but I know he wasn't always "appreciated." I'd like to think he is by those of us attending this Fire Appreciation Day. I often bemoan how he would likely turn over in his grave at how quickly "burn bans" are imposed today. When I saw the first hinged "Burn ban in effect" sign about 10 years ago I knew it wasn't a good "sign" for the future of prescribed burning.

I appreciate fire in all three contexts, and I seek to be a responsible pyromanager. You never burn in secret . . . your smoke column identifies you in good situations or bad. As such we all have a stake in burn politics, and a responsibility to be a good example for those who are watching.

When we acquired the RPQRR in 2007, a series of hunting roads was established. My first thought was "fire breaks!" We've conducted some 70 prescribed burns here since then, in just about every month of the year. And I'm proud of my team when I say out of those 70, we only burned about an acre outside of our prescribed burn unit. We'll tour some of the things we've learned today—including some "outside the box" thinking. I consider fire to be a Crescent wrench for range and wildlife managers—perhaps not perfect for every situation, but something mighty handy to have in our toolbox.



Fire history of the Southern Great Plains

Robin M. Verble-Pearson, Ph.D.; Texas Tech University Fire Ecology Laboratory; robin.verble@ttu.edu

In the southern Rolling Plains, the ecology of shortgrass prairies is intrinsically linked to wildland fire. Historically, Native Americans used fire to aid in hunting activities and to concentrate and move game animals. The role of fire in management and ecology of grassland communities was widely recognized; however, early European settlers introduced fire suppression as the standard of management.

Grasses are generally better adapted to drought than tree species, and the spread of grasslands occurred at the expense of forest vegetation. Fire interacts with topography, soil, insects, herbivores, and herbaceous plants to restrict woody plant establishment in grasslands. There are currently no quantitative studies or reliable records of fire frequency in the southern Rolling Plains. Tree ring records are impossible to use, due to the scarcity of old trees. Charcoal deposition in playas may be used to ascertain fire history; however, depth, size, and seasonal cycles of these systems may limit their usefulness.

Traveler and historic accounts suggest that fire size and frequency have diminished substantially in the Rolling Plains since European settlement. While historical accounts are anecdotal and tend to be biased toward large and destructive fires, these are useful in understanding the cultural and economic roles of fire in the community.

Many studies state that overgrazing of livestock has contributed to modern changes in fire regimes. Grazing produces changes in the physical and biological environment that influence the frequency and intensity of fires in shortgrass prairies. Fires may cause short-term declines in plant biomass; in one study in New Mexico, plant biomass did not return to pre-burn biomass until the end of the third growing season. However, in normal and above-average precipitation years, most studies find no loss of herbage yield at the end of the first growing season. Fire also impacts wildlife and other faunal communities in shortgrass prairies. The direct and indirect effects of fire on animals depend on the timing, extent, and intensity of a burn. In general, most animal populations recover from fires in the short-term; however, fires may exclude rare or patchy species.

In the past thirty years, wildland fires have been reintroduced through prescribed burning. Prescribed burning cooperative organizations, federal and state agencies, and private landowners and managers have been instrumental in implementing fire management programs throughout Texas. In addition to the ecological benefits of these programs, prescribed burning decreases wildfire risk, stimulates forage for grazing animals, and promotes healthy biogeochemical cycling.

STOP 1

Planning/implementing a prescribed burn on RPQRR, Lloyd LaCoste

Fire weather (Matt McEwen, Southern Rolling Plains PBA)

Special considerations (Dr. Morgan Russell, Agrilife Extension)

Planning/implementing prescribed burns on RPQRR

Lloyd LaCoste, RPQRR; lmlacoste@ag.tamu.edu

Everything we do at the Rolling Plains Quail Research Ranch is geared towards quail in one way or another. This includes the reasons why we conduct prescribed burns at RPQRR. There are many reasons why we conduct burns some include looking for quail friendly ways to reduce prickly pear to improve the huntability of a portion of the ranch, to reduce volatile fuel loads to prevent wildfires and allow for more easy movement of quail, and to set back succession reducing amount of grass and increasing forbs depending on the time of the burns.

We typically choose more burn units on the ranch than we can burn during a burn season, then prioritize them. Burn units are polygons utilizing our existing road system with bladed roads which act as our fire guards. We attempt to strategically burn the polygons based on sensitive smoke receptors such as Highway 180 and FM 611. We will only burn units near these areas when we have a wind that will not put smoke over these roads. We try to burn the polygons in an order in which each previous burn gives us additional amount of areas that will provide blackened out areas in case of an escape. That is to say we will burn the ranch in most cases with a southwest wind so we will burn our furthest north east polygon first then continue in a southwesterly direction. The previous burned unit will then provide buffers us if we have an escape from the unit we are currently burning.

At RPQRR Burn plans are made using a Texas Department of Agriculture burn plan. Spot weather forecasts can be requested on the NOAA website, but in most cases we are in contact with a fire weather forecaster with the National Weather Service (San Angelo office) repeatedly even while we are conducting the burn.

Prior to the burn equipment should be tested to verify it is in good working condition. Maps should be made of the burn area and any hazards should be identified. We notify neighbors, Texas Forest Service, Texas Commission on Environmental Quality, and the local fire-police dispatch. The local fire dispatch is notified not to send anyone unless Dr. Rollins or Lloyd LaCoste requests assistance. We also ask that they relay that information to the people filling the next shift. We will contact the dispatch after burning is complete to notify them that we are done.

During the burn one person is designated as the burn “Boss”. This person will assign tasks for each individual and describe any hazards it may present, and how we intend to burn the unit. We often burn several small units 20 to 200 acres and try to give opportunities to people to perform many tasks while they are burning at RPQRR. We like to provide learning opportunities and act as an outdoor classroom for people wanting to learn about how to use fire on the landscape.

After the burn we will debrief discussing what went right with the burn, and what we could do to improve our efforts. We "mop up" the fire removing any smoldering logs that are close to the fire guards, and monitor the burn units to assure that any remaining hot spots do not create embers that start a fire in an area that we did not intend to burn. We will then contact Texas Commission on Environmental Quality, Texas Forest Service and the police- fire dispatch to let them know that we have completed our burns.

One of the tasks assigned by the burn "Boss" is weather recorder. This person uses a "kestrel" to record weather conditions during the burn. Below are tables with the weather data from the burns conducted this year.

03/15/16
East Annie Plots and Suzie Pasture

Time	Temp	RH	Wind Average	Wind Max
1:10	76.0	25.2	4.8	10.4
1:30	74.8	27.0	4.3	7.5
2:00	76.1	22.0	5.5	10.8
2:30	80.2	19.4	5.4	7.9
3:30	76.9	20.9	6.4	9.8

03/19/16
Doc Pasture

Time	Temp	RH	Wind Average	Wind Max
1:30	50.0	38.0	6.5	9.5
2:30	51.4	35.0	4.0	6.9
3:00	55.7	39.0	8.4	13.0
3:30	61.0	37.0	2.1	4.4
4:30	58.1	39.0	4.8	8.2
5:00	66.0	28	1.3	4.2

Fire weather

Matthew C. McEwen, Southern Rolling Plains Prescribed Burn Association;
matthew.mcewen@ttu.edu

It's not prescribed burning without a prescription to burn. Finding weather days and patterns that fit with your prescription take patience and preparation. Become a weather geek. When you're looking for a window to burn during your preferred season, check the weather everyday, sometimes multiple times a day. When you are calling a GO for the burn, check the long-term forecast, Fire Weather Forecast, call in for a Spot weather forecast, and always check the weather on the ground and conduct a test fire. Know your local weather patterns, after several seasons of successful prescribed burns on your ranch, you'll become familiar with days that just feel good for burning, but that doesn't negate being patient and prepared. It's better to call off the burn if weather conditions change, than to decide to burn just because you have the crew all assembled, and you called the DPS, TFS, etc.

WIND is the most difficult to forecast, in all likelihood, no matter your preparedness and patience in planning the burn, wind will be the determining factor for a GO/NO GO decision. Consistent speed and direction is important, but be prepared for changes and adjust accordingly (change ignition pattern or call it off). This year was especially difficult to plan due to changes in forecasted wind speed and direction.

The prescription for burning firelines is:
1) temperature 40-60°F
2) relative humidity 40-60%
3) wind speed 0-10 mph.
This prescription minimizes the chance of spot fires.

The prescription for burning heafires in west Texas is:
1) temperature 70-80o F
2) relative humidity 25-40%
3) wind speed 8-15mph.

Never burn under these "red flag" conditions:

a) wind gusts greater than 20 mph
b) relative humidity below 20%
c) air temperature above 80°F
d) cold front to pass within 12 hr.

A belt weather kit is used to monitor temperature, relative humididty, and wind speed. A sling psychrometer is demonstrated in the foreground and a windspeed indicator in the background.

Special considerations for prescribed burning

Morgan L. Russell, Texas A&M Agrilife Extension Service, San Angelo;
morgan.russell@ag.tamu.edu

Special considerations for prescribed burning revolve primarily around an active, functioning, and specific burn plan. Every prescribed burn should have a burn plan. Consult www.gpfirescience.org and www.pbatexas.org for more information.

Here are RX Fire tips:

- Check that the pumpers and other equipment are in working order.
- Label all torch fuel mix and gasoline cans clearly
- Check access roads
- Line up communication
- Have a clear map with contingency plans
- Be aware of all power lines, smoke can ground electric lines
- Know who you are burning with and check the burn crew for health issues prior to ignition (such as allergies, heat exhaustion, diabetes, etc.…)
- Remove propane heaters from hunting stands and pay special attention to fiberglass or plastic stands
- Be mindful of appropriate mitigation (wet line, black line, mowed line, etc.…) around hunting stands, working corrals, water tanks, and other areas of interest and importance
- Know where the smoke goes and own it (consult smoke modeling maps such as the Simple Smoke Screening Tool, BlueSky, HYSPLIT, VSmoke)

- Manage smoke sensitive areas with respect and open communication
- Clear a 3-ft wide diameter around power line poles
- Keep brush piles off the line, and at least 150 feet interior of fire lines, or more depending on fuel volatility
- Be aware of all telephone juncture boxes and mitigate as appropriate
- ALWAYS call the sheriff's office and notify exact location and time of ignition
- ALWAYS call the County Judge or other officials
- Do not burn within 24-hr of a cold front
- Drink plenty of water
- Notify oil and gas companies of planned prescribed burn at least 3 days prior to burn
- Scout out all oil and gas distribution lines laid on surface and potential leaks ahead of the prescribed burn
- Always have the local VFD on standby

STOP 2

Fire & prickly pear

The prickly paradigm—D. Rollins

RPQRR trials—D. Rollins

- Season of burning
- Fire w/wo herbicides
- Prickly pear response
- Forb & shrub response

Aerator with sprayer demo (Mark Moon)

Smaller unit for use with farm tractor

Cactus: a prickly paradigm for quail managers

Dale Rollins, RPQRR; drollins@quailresearch.org

"Many ranchers do declare,
They've got too much prickly pear.
It's a thorny plant that they despise,
But it sure looks good through a quail hen's eyes!"

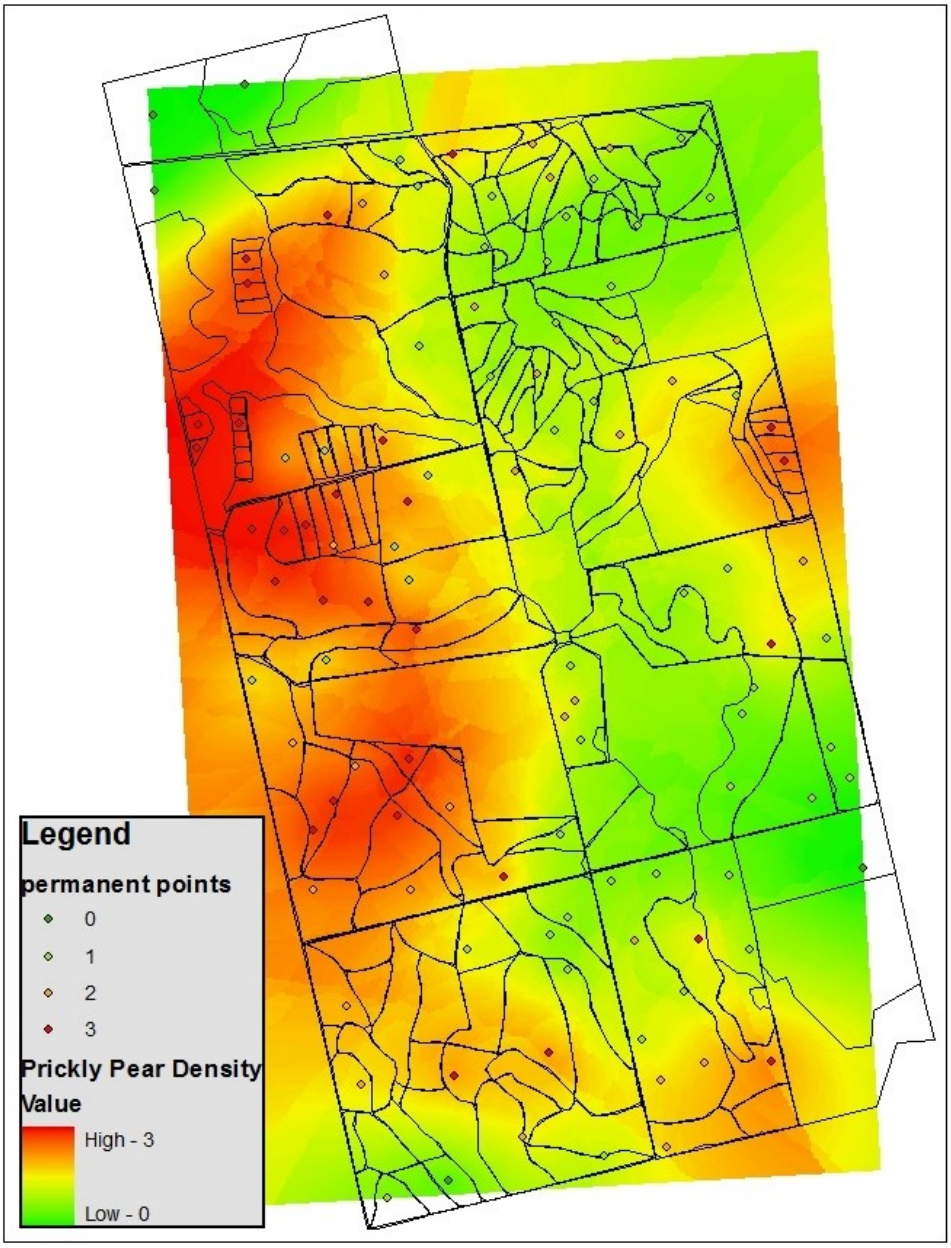
When my son Travis was four years old, he accompanied me on a jackrabbit hunt in cactus-studded country. After getting impaled several times, he looked at me tearfully and asked "Daddy, why did God make prickly pear anyway?" It was another ten years before I could give him a good answer. Quail nest in prickly pear . . . a lot; especially in drought years or on heavily-grazed country. And quail nests in cactus survive at about twice the rate of those situated in grass (until one reaches a threshold of about 300 bunchgrass clumps per acre). Larger mottes of "south Texas pear" also serve as "quail houses" and indeed "storm cellars" when a raptor is on their tail.

But moderation in all things. Cactus gets to thick for ranchers before it gets to thick for quail hunters before it gets too thick for their bird dogs, before it gets too thick for quail. We've got lots of prickly pear (at least 3 species) with the "ground pear" being the most troublesome. And we know how to kill it—an application of Tordon or Surmount ideally following a prescribed fire. But we also are aware of "collateral damage" to some of our desirable plants (e.g., hackberry). At RPQRR, we seek to (a) understand the "side effects" and (b) seek to develop and apply the most –quail-friendly approach to prickly pear as possible.

Our quest for such a strategic goal has involved herbicides, mechanical treatments (e.g., aerator), seasonal fires, and "pyric herbivory" (i.e., grazing plus fire). We have investigated these combinations for several years with those results presented in the next few pages. We seek to apply our treatments "surgically" in a brush-sculpting sense. Accordingly, we've used helicopter applications, Individual Plant Treatments, and patch-burn grazing.

Cool-season fire alone reduces prickly pear only for a short period of time. Hotter (i.e., August) fires following pre-treated fuels (with glyphosate) has shown excellent results, but it difficult to recommend, especially for quail managers (i.e., too hot on loafing coverts). Patch-burn grazing is intriguing and deserves more attention; our initial results were encouraging, but we "droughted out" in 2011. However cows preferentially grazed our "south Texas pear" which we considered a negative. Typically they did not consume burned pads until about 12 to 15 days post-burn; I'd be interested what it is that changes during that time (perhaps fermentation?).

We are presently treating a "fairway" that will transect the ranch in order to host a field trial next spring. Our treatment of choice is an aerator equipped with a remotely-operated boomless sprayer using Surmount. This method has proved useful on quail ranches near Albany.



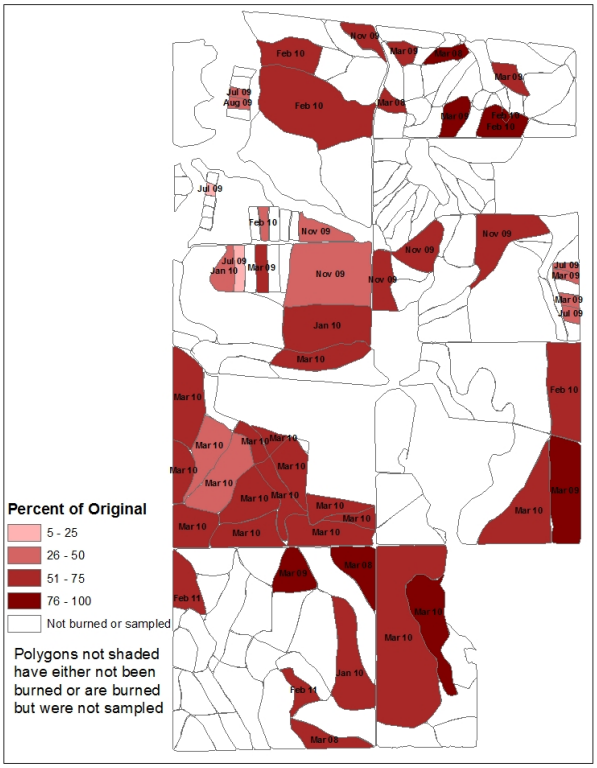
Prickly pear density gradient at RPQRR, 2010. Points indicate permanent transects from which pad density was recorded.

Prickly pear reduction following warm- and cool-season burns

Dave Barre, RPQRR

We measured prickly pear densities across the ranch in certain polygons and plots that have been burned either in cool or warm season prescribed fires. We continue to sample burns at 1-, 2-, and 3-years post-burn to determine whether prickly pear densities return to pre-burn levels. In April 2010 the Meg pasture was also treated with a 32-oz/ac rate of Surmount, about 5 weeks following a prescribed fire implemented on March 13th 2010, and so has been summarized separately from the summer and winter burns. Prickly pear responds differently following warm- vs. cool season burns. Cool-season burns reduced pad numbers by only 30% of initial densities at 1-yr post-burn whereas warm-season burns reduced pad numbers by twice that (63%). At 2 years post-burn, cool season burn polygons returned to about 96% of initial densities, whereas warm season burn polygons had increased to almost 70% of initial densities. In the Meg pasture prickly pear densities were reduced to about 58% of initial densities at 1-yr post-burn. Pear re-growth occurred more quickly in cool-season burns compared to warm-season burns and it is yet to be determined if chemical and cool season-burn treatments combined keep prickly pear densities from returning to pre-burn numbers.

Prickly Pear Densities - 1 Year Following Burns
Percent of Original Density



% Yr-0	Years Post Burn		
	Yr-1	Yr-2	Yr-3
Control	115.2	120.4	124.0
Summer	37.5	69.5	X
Winter	70.7	96.4	98.8
Meg	58.3	X	X

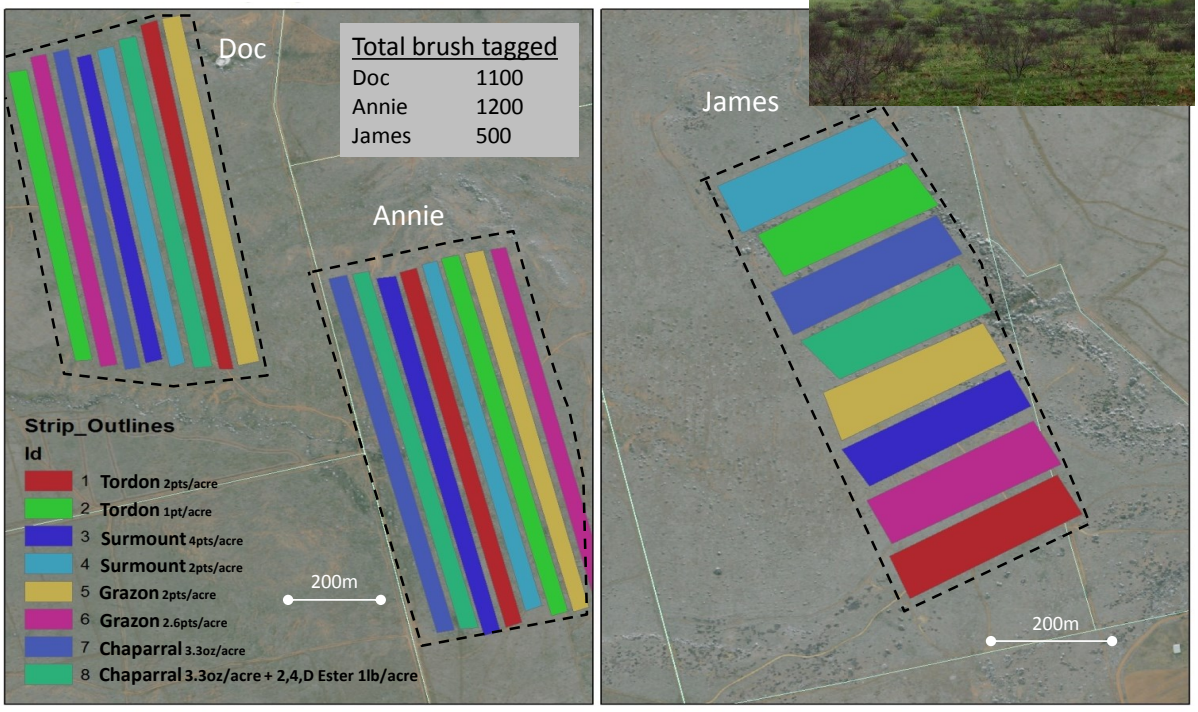
Note: We pre-treated a few summer burn polygons with glyphosate (64 oz/ac) in July 2010, then burned three weeks later with air temps of 102 degrees, winds 5 to 8 mph, and relative humidity from 20 to 30%. Prickly pear densities were reduced to 5% of initial densities, then returned to about 20% of initial densities after two years. (Data not shown in table). The following September these plots were covered with Texas filaree. The following September they were mostly common broomweed (which we considered an asset for quail).

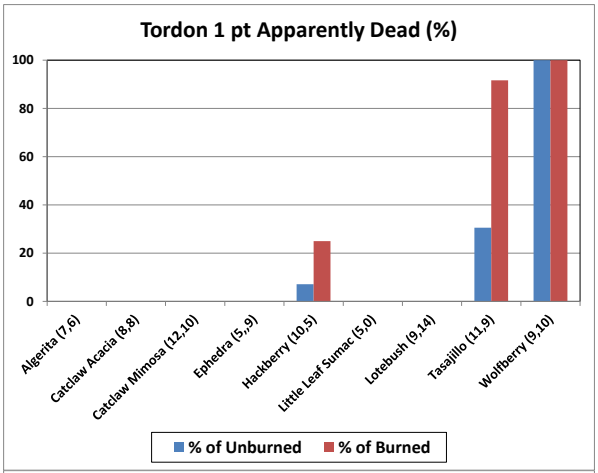
Brush mortality response to prickly pear herbicides and burning

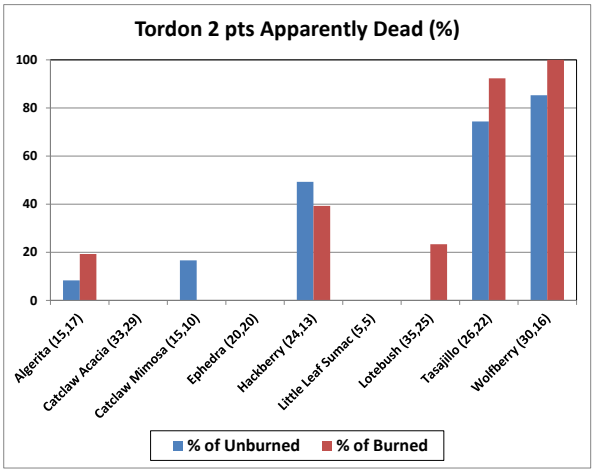
Dave Barre, Jordan Graves and Dale Rollins, RPQRR

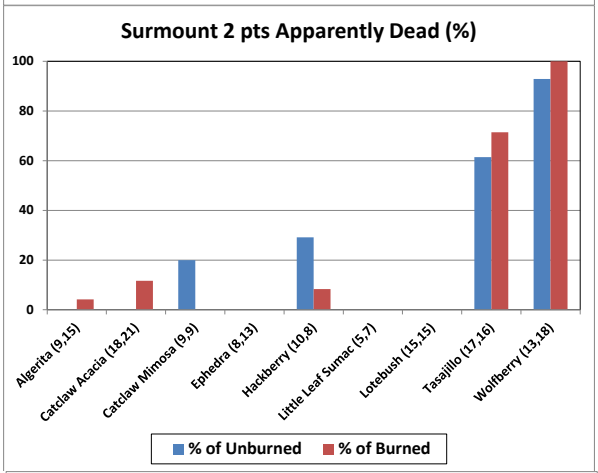
Dense stands of prickly pear occupy several pastures on RPQRR. In April, 2010 we applied various herbicides for cacti control using a helicopter. Our objective was to determine the "collateral damage" to desirable woody shrubs (e.g. hackberry and lotebush). A total of 500 acres were sprayed in three different pastures, with eight treatment strips (four herbicides at different rates) in each pasture crossing areas of prescribed burning to see combined effects (burning and chemical). These strip "plots" were evaluated, at the 1-yr following treatment, for shrub, forb and grass dynamics. Control (untreated) areas are sampled around the perimeter of the strips treated. Brush species were tagged with ID numbers and GPS points for future location and subsequent monitoring. Prickly pear density will be monitored, as die-off continues, using length-wise transects through each strip. It will be some time (two to three years after treatment) before a percentage kill of prickly pear can be estimated. Wolfberry and tasajilla were affected considerably by all eight treatments. Hackberry was somewhat affected by all treatments especially if combined with burning. Grazon Next and Tordon at the higher rate affected more species, whereas Tordon at the lower rate affected the least number species. Additional evaluations will take place for the next two years.

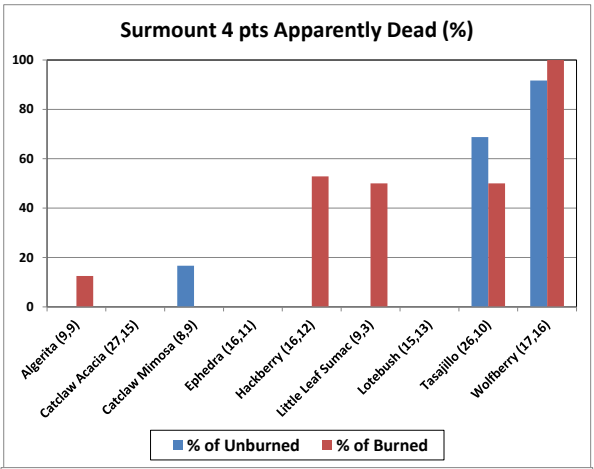
Funding provided by Dow AgroSciences and RPQRR.

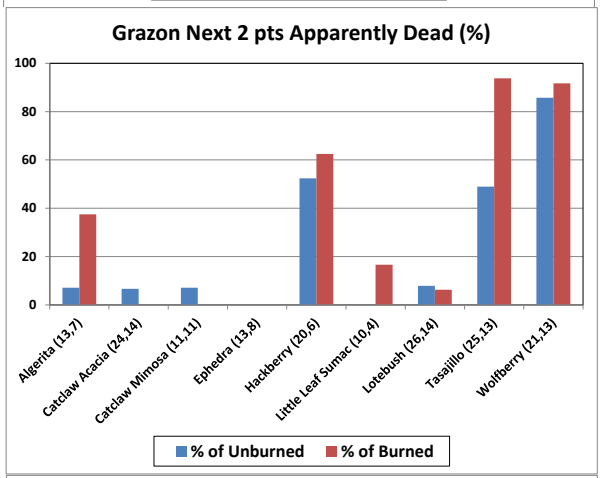


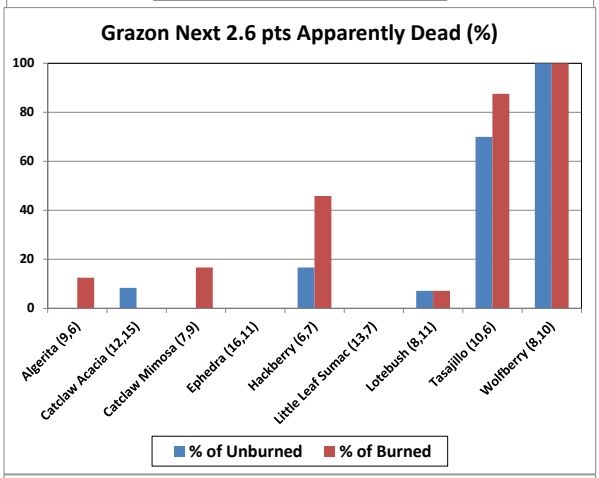


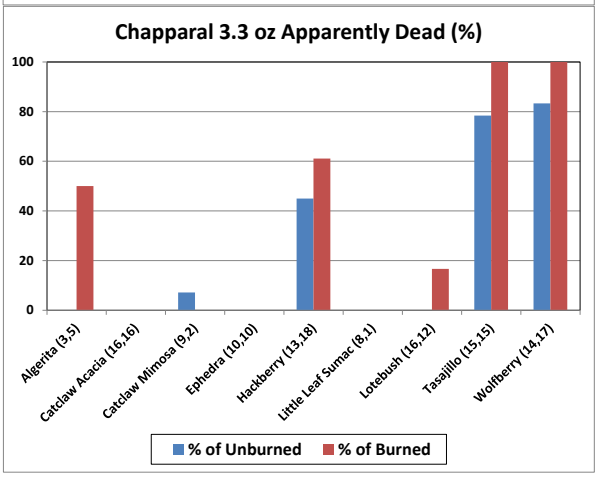


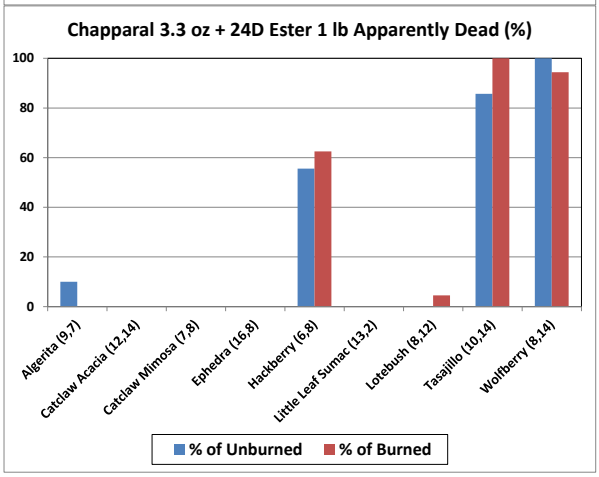












Percent of each shrub species that is “apparently dead” as of 1-yr post-treatment.

Assessment of "forb shock" to prickly pear herbicides: Year 2

Zack Slick, Adrian Cain, and Rachel McMath, RPQRR

In April 2014, we aerially-sprayed areas of concentrated prickly pear with two herbicides (Surmount and Tordon). One concern about such treatments is "collateral damage" to forbs and woody shrubs (e.g., netleaf hackberry). Our objective was to determine whether these herbicides have collateral impacts on the forbs beneficial to quail, and if so, for how long, i.e., "forb shock."

We quantified forb abundance of 8 species in treated and check plots. The 8 forb species included: Annual Sunflower Field Ragweed, Western Ragweed, Croton Annual broomweed, Texas wintergrass, Silver bluestem, and Pricklypear . In each polygon, a round, 1-m^2 quadrat (i.e. hula hoop) was used to define each sampling unit. Each 10 steps we documented presence or absence of each forb specie in ≥1,000 samples per polygon.

July 2014

	Surmount	Tordon	Control
Forb %	25.7	19.6	55.8
Pricklypear %	28.3	32.2	20.0

July 2015

	Surmount	Tordon	Control
Forb %	67.0	74.1	75.5
Pricklypear %	26.2	15.5	29.2

When comparing these treatments realize that spray treatments were targeted on the thickest prickly pear, i.e., "control areas" therefore had lower pricklypear abundance. Forb occurrence was more equitable across treatments in 2015 There was a larger decrease in Tordon areas than Surmount, something we will continue to monitor for a third year (these herbicides can take up to 3 years in order to see full results). In terms of our forb species, we saw a large increase across the board in 2015 because of abundant precipitation, and this includes our prickly pear control areas. We will continue to monitor these sites again in 2016.

In-kind funding provided by Dow AgroSciences, LLC.

STOP 3

Annie Pasture — Species responses to burning

Livestock (Kent Mills, Hi-Pro Feeds)
Deer (Barrett Koennecke, TPWD)
Quail (D. Rollins)
Other consumers (arthropods, small mammals) (Brad Kubecka)

Fire & livestock

Kent Mills, Range Nutritionist, Hi-Pro Feeds, Friona; kmills@wildblue.net

Prescribed fire in range ecosystems offers livestock managers many unique benefits and detriments that are important to their operations. However, these benefits don't come without some increased management and planning to take advantage of them.

Benefits such as grazing prickly pear pads, with the spines removed by the fire, is one that can be taken advantage of shortly after the fire is completed and the danger of hot spots flaring up are taken care of. However, the window to graze these pads is short, because the new, desired regrowth forage needs deferment to allow it to recover from the fire.

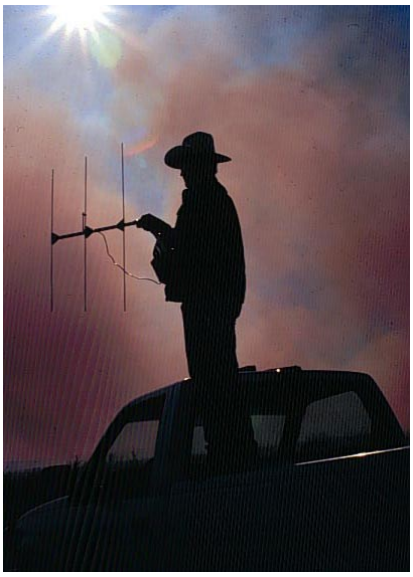
The most positive of these benefits is improving the utilization of many less preferred plants that livestock do not consume readily, such as tobosagrass, three-awn, tridens, and many bluestem species of grasses for cattle and sheep, and reducing brush canopies on browse plants like oaks, sumacs, lotebush, and others to provide new growth that is easily browsed by sheep, goats, and deer. Because many of the less preferred forages were not grazed in the previous growing season, they have high fiber levels that translate into lower energy values, lower animal performance, and continued less use. A fire regimen removes the old growth forage and makes new growth available for the animals. This new growth is higher in nutrition for four to six weeks after the initiation of the growth than areas that were not burned. The levels of protein, energy, and some minerals such as phosphorous are elevated on these post-fire conditions which lead to a more productive performance by the livestock.

Of course, prescribed fire is not all benefits to livestock operations. Grazing must be deferred to allow the accumulation of a sufficient fuel load to conduct a continuous fire that accomplishes the goals of the manager. This deferment can last from 6 months to a year, depending on the amount of moisture and level of grazing prior. This can mean a reduction in the total numbers of animals that a manager can graze, or a shift in the different species of animals, in the case of multi-species grazing (sheep, goats, and deer). Also, the management after the prescribed burn is more intensive than in non-burn regimens. Determining when, and how long, to graze prickly pear pads, cool-season forages, and warm-season forages to optimize use of each can complicate the management of the other pastures on the ranch. Care must also be taken to give the forages ample time to recover from the fire, as the plants will have to call on nutrient reserves in their roots to start and maintain new growth. Grazing too heavily and too soon after a fire can cause loss of some of the preferred forages when grazing commences.

Prescribed fire can be a very beneficial tool to a range manager to enhance utilization of less preferred forages and receive a boost in animal production on native and cultivated pastures. Knowledge of the ecosystem and fire can help with planning and management of the range with the goal of improving the quality of the range for your livestock.

Application of prescribed fire for quail managers in the Rolling Plains

Dale Rollins, RPQRR; drollins@quailresearch.org



In the southeastern U.S., the bobwhite is sometimes referred to as the "bird of fire." In that climate (40+ inches of precipitation annually) fire at a 2-3 year interval is one of the "legs" of the management "stool." In west Texas (annual precipitation about 20 inches) however one must appreciate that fire has more limited applications for quail managers. These differences stem from how quickly (or in our case how slowly) secondary succession advances.

Fire can accomplish various objectives for quail managers, including increasing food availability (seed production of grasses and forbs, and increases arthropods). It can also foster desirable plants (e.g., various legumes) especially on coarse-textured (i.e., sandy) soils. It can increase bare ground, but that's rarely a management concerns for us here in west Texas. Coupled with timely grazing, burned areas can provide excellent brooding cover (e.g., sunflowers and various forbs) while providing protection from raptors and ease of access for chicks.

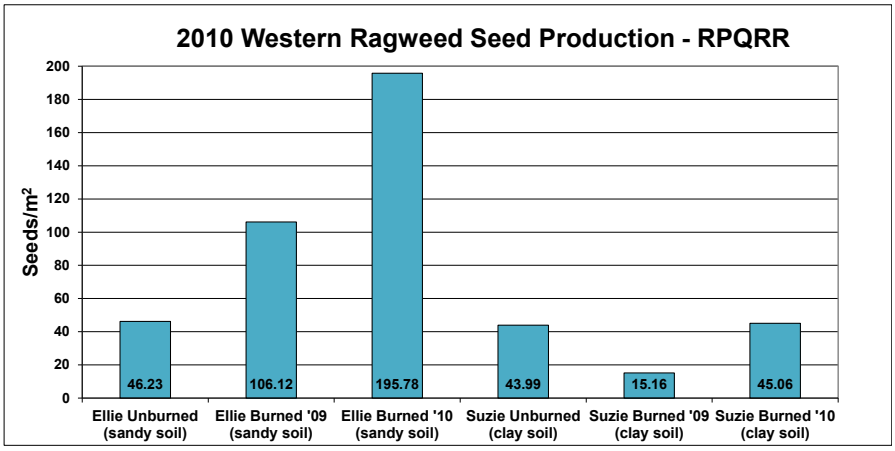
Fires cause little direct mortality—quail are not going to burn up as the flame front advances. Typically they fly over or around the advancing flame front to nearby cover. It's not unusual to see them on the burned area within an hour foraging (or investigating).

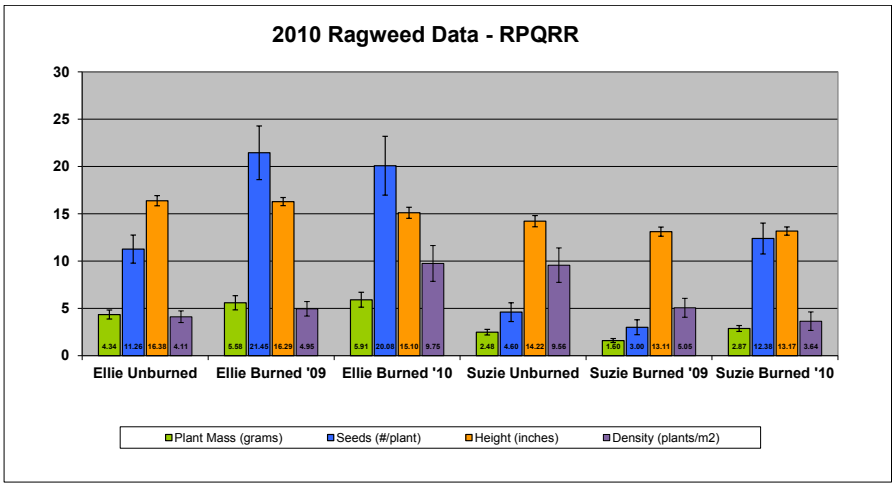
The biggest liability from using fire is the removal of cover, either in the short- (e.g., Mar-Apr) or long-term (via topkill of various shrub used as "quail houses." Following a reclamation burn it can take 20 years or more to regain the shrub stature important to quail at this location. Accordingly, instead of a fire-return interval of 3 to 7 years (often advocated), a slower burn frequency (perhaps 10 to 15 years) may be more appropriate, especially on fine-textured soils (e.g., clay loams).

Impacts of dormant-season burning on seed yield in western ragweed

David A. Barre and Dale Rollins, RPQRR

Seeds of western ragweed (*Ambrosia cumanensis*) are a major component of the winter diet of bobwhites (*Colinus virginianus*). We measured seed yields of western ragweed on the Rolling Plains Quail Research Ranch (Fisher County) to determine whether dormant-season burning can stimulate seed production, as it can do for other plant species. In November of 2009 and 2010 western ragweed was sampled using a stratified random design on two rangeland sites burned in March 2009 and March 2010, respectively, and from two adjacent unburned control areas. In 2009, seed counts were 2-3 times greater on plants from burned areas (8.54 ± 0.89 and 10.92 ± 1.93 seeds/plant) than plants from unburned areas (4.26 ± 0.62 and 3.54 ± 0.69 seeds/plant, $P<0.05$). In 2010 a similar trend was evident; with mean seed yields in burns (20.08 ± 3.11 and 12.38 ± 1.64 seeds/plant) approximately double that of the unburned means (11.26 ± 1.49 and 4.60 ± 1.00 seeds/plant). These data suggest that an immediate and, in some cases, 2-year treatment effect is possible for ragweed seed production following dormant-season burning.





Fire effects on white-tailed deer

Barrett A. Koennecke, Texas Parks & Wildlife Department, Roby;
Barrett.Koennecke@tpwd.texas.gov

Prescribed fire is an excellent tool to stimulate and maintain forage and cover for white-tailed deer. Browse (the leaves and twigs of woody species) and forbs (broadleaf herbaceous plants) make up the majority of a deer's diet throughout their range. When most plants are burned they tend to become more vigorous and send several shoots or stems up from below the ground or from undamaged branches of a plant. This in turn provides deer and other wildlife with more available vegetation to consume. The regrowth of many shrubs and plants tend to have much higher protein and nutritional content than the normal growth per year on the same plants. Some studies suggest that many shrubby species produce and abundance of fruit the years following fire although there is a drop in mast production the same year of the fire. For the first two weeks following a fire the area will mostly be devoid of wildlife until the first green shoots start making their way out of the ground, but after that time you will start to see deer concentrated on those areas feeding in the mornings and evenings.

The biggest advantage of burning is to set back succession. Succession in the Rolling Plains of Texas starts out as bare ground. The first forage species to sprout and come up are the forbs. Grasses tend to follow quickly behind within a year or two. At this point if no fire or other disturbance persists, then woody shrubs and trees start to encroach in the area with only a few at first and gradually becoming denser. As that area becomes dominated with shrubs and trees the canopy starts shading out the ground reducing the coverage of forbs and grasses. High quality deer habitat is a mixture of scattered shrubs with abundant forbs and grasses. You do not want the entire area or ranch with a dense mesquite or juniper canopy but rather a mosaic of dense cover and open areas with scattered shrubs throughout.

Before settlers came to this land, fire was a frequent part of the landscape but as fences were built and farms were plowed fire frequency was greatly reduced. We live in about a 20 inch rainfall zone and so shrubs and trees are slow growing. In about a good 10 - 15 years seedlings will reach their mature height out on the rangeland so if you are managing for deer habitat you would want your fire return interval to be about every 10 years. As a general rule you only want to burn 10%-15% of the pasture per year so there is a nice mixture of old growth and new growth. The fire-return interval influences vegetation composition and structure more than any other factor. However, timing of burning can also influence vegetation composition and associated structure. Within a given fire-return interval, burning during the dormant season sets back vegetation structure, but often does not change vegetation composition appreciably. Most woody species readily re-sprout following fire in any season. Typically you would want to burn during the months of December-February in what we would call a "cool season fire". During that time you typically have lower temperatures and higher humidity so you don't burn up your brush as badly and leave some as screening cover. A fire during the summer months ("warm season fire") is used to accomplish other goals such as reducing prickly pear.

If burning the pasture seems to involve a little more than what it's worth, consider this: burning 4 acres of rangeland typically provides as much warm-season forage as 1 acre of soybeans. The increased forage following burning will persist at least 3 – 5 years, whereas warm-season food plots have to be planted each year. Any serious deer manager can't afford to not consider using prescribed fire.

Arthropod and small mammal response to burning

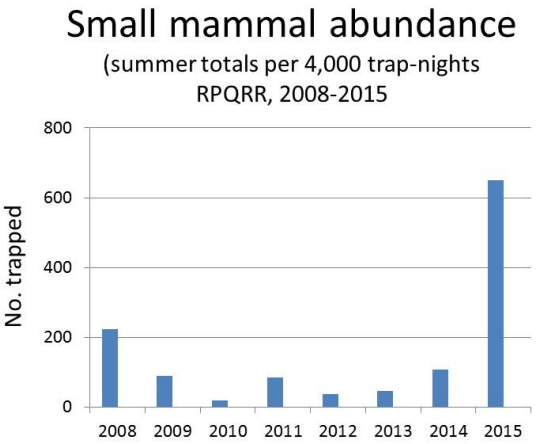
Brad Kubecka, Graduate Research Asst., RPQRR; bradley.kubecka@students.tamuk.edu

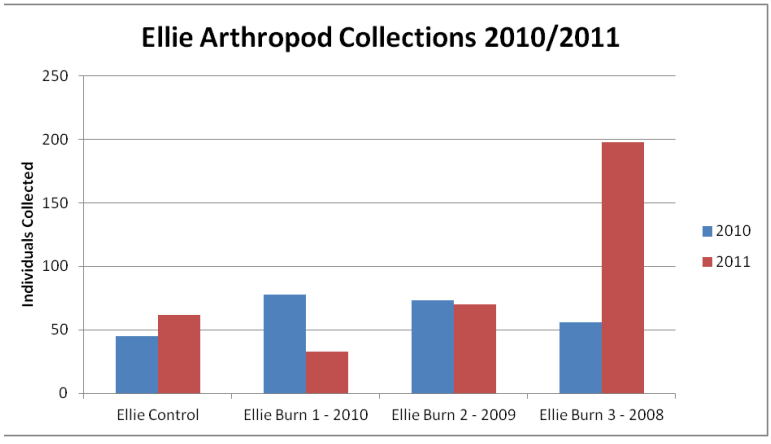
The abundance and diversity of arthropods and small mammals are important because they lie at the base of the food chain. Arthropods (e.g., insects) are one of main food resources for quail. Rodents can serve as a "buffer species" to lessen predation impacts on quail. Managing for these groups of species can be achieved through many methods, but fire is one of the best tools in the manager's tool chest.

The effects of fire on arthropod and small mammal abundance and diversity are varied in the literature. This variation can be attributed to study durations, methods, and location with interactions occurring among the burn season, amount of brush, and precipitation. However, trends seem to appear. For example, woody cover has been shown to be inversely related to arthropod abundance and diversity (i.e., arthropod abundance and diversity decreased as woody cover increased). Thus, using fire to manage woody cover and heterogeneity may also be beneficial for promoting arthropods. Given the plethora of research regarding response of small mammals and arthropods, positive and neutral effects of burning tend to the most prevalent in the literature with negative effects typically attributed to short-term studies and specific wildlife groups.

Given a patch-burn grazing design, Engle et al. (2008) showed fall and spring patch-burning plots had 50% greater invertebrate mass than unburned plots. However, various species of small mammals and arthropods seem to respond differently to fire and grazing. For example, Hess and Beck (2014) suggested that fire decreased arthropods on Wyoming big sagebrush rangelands. Likewise, small mammals tend to depict similar trends, with some species abundance increasing post-burn while others may decline.

At RPQRR we conduct an arthropod survey in July to estimate the overall abundance in 8 habitat types. When conducting the survey we used two sampling techniques, Pitfalls and Sweep nets. We trap rodents twice annually (January and June) using Sherman traps. All arthropods are sorted to Order, counted and recorded. Results to date suggest that the oldest burns (2008)

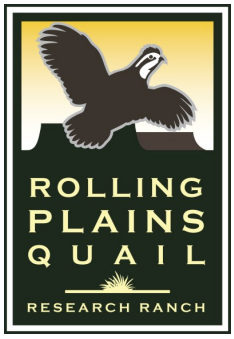




STOP 4

Lunch

THANKS TO OUR SPONSORS!!



Rancher's perspective on prescribed burning

Jim Bob Cave, Snyder; jrlepcave@yahoo.com

My family has operated ranches in Fisher, Coke, Scurry, and Dickens counties for the past 31 years. I presently serve as the chairman of the Southern Rolling Plains Grazing Lands Coalition. The regional coalition is fortunate to have Matt Coffman a grazing specialist assigned to the Snyder NRCS office

Like most livestock producers with historical ties to the land, I strive to restore grazing lands to the prairies on which my great grandfather settled.

Over the past 30 years, I have been involved in and observed a number of controlled burns and wildfires. The resulting range conditions have been varied with both livestock and wildlife impacted. I really believe that the preservation of our grazing lands requires the planned use of a number of tools such as rotational grazing and fire. Balancing the use of resources by livestock while encouraging quail habit requires some compromises and planning.

Southern Rolling Plains Prescribed Burn Association

P.O. Box 1562
Sweetwater, TX 79556
southernrollingplainspba@gmail.com

Follow us on:
http://pbatexas.org/association/SRPPBA
Facebook: https://www.facebook.com/SRPPBA
Twitter: https://twitter.com/SRPPBA_TX

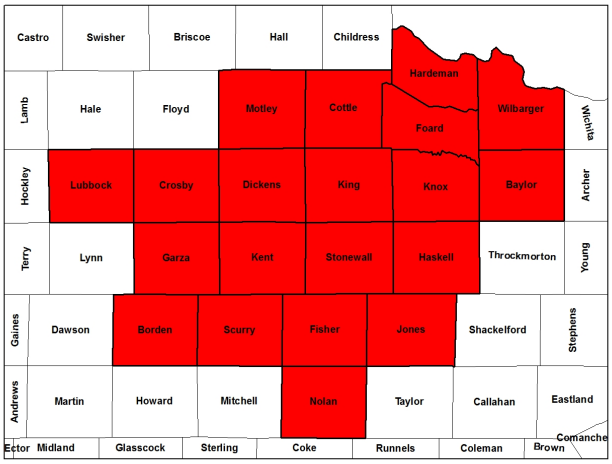
Our Mission:

The SRPPBA of Texas is dedicated to promoting land stewardship through the safe use of prescribed fire and to helping reduce fuel loads in support of wildfire prevention and mitigation through education, support, technical expertise, leadership, guidelines, and standards for the safe application of prescribed fire. Counties include: Baylor, Borden, Cottle, Crosby, Dickens, Fisher, Foard, Garza, Hardeman, Haskell, Jones, Kent, King, Knox, Lubbock, Motley, Nolan, Scurry, Stonewall and Wilbarger. Membership benefits include joining a network of land owners interested in prescribed fire and access to specialized equipment that can facilitate conducting prescribed fires for a small usage fee. The SRPPBA also provides a variety of educational opportunities and resources related to prescribed fire in the Rolling Plains of Texas.

Who we are:

Like-minded members of the community who believe in and use prescribed fire as a tool in the management of the land and ecosystem.

We have three prescribed burn equipment trailers spread out across the 20-county region, currently located in Paducah, Roby, and Lubbock. Each one is fully stocked with tools for weather, ignition, suppression, communication, and safety. They are available to you as a member for a daily rental fee.



Annual Membership $25.00

President: Michael Tynes
(817) 368-0250
Vice President: Matthew McEwen
(806) 778-7346
Secretary: Derrick Holdstock
Treasurer: Beall Carothers

Texas Parks & Wildlife Department's support of prescribed burning

Seth Pearson, Biologist, Ralls; seth.w.pearson@gmail.com

The Wildlife Division of Texas Parks and Wildlife Department is able to help with most aspects of prescribed burning on private land. The Division is able to provide guidance about how prescribed burns could help your land and what goals may be realistic for your property. With goals in mind we are further able to assist in the planning process and implementation. While we can assist with implementation in the forms of personnel on the ground and some equipment we are not a burning service and will not install fire lines or lead prescribed burns. Our goal is to provide guidance and mentorship to empower the landowner to be able to carry out prescribed burns safely and effectively.

NRCS assistance with prescribed burning in Texas

Ethan McJames, Range Conservationist, Abilene; Ethan.McJames@tx.usda.gov

Information below excerpted from GM_GMSS_TX_190_413_B - Subpart B - Texas Policy on Prescribed Burning

NRCS supports and encourages the use of prescribed burning when used within the context of a Conservation Practice agreed on through the Conservation Planning Process. Only trained and certified NRCS personnel are authorized to provide assistance that includes prescribed burning as a conservation practice. Prescribed burn planning authority is granted to these individuals. The designated state staff specialist (either State Forester or State Rangeland Management Specialist) with prescribed burning responsibility will determine the amount and kind of training necessary for each level of job approval authority. NRCS encourages employees to participate in prescribed burning training activities and workshops, including those conducted by other agencies or organizations.

The minimum level of authority for field employees is the Prescribed Burn Planning Authority. This authority affords the opportunity for the conservationist to discuss, recommend, and develop a prescribed burn plan. However, until the employee is issued further job approval authority, he or she cannot sign off on the prescription. He or she must then participate in at least three supervised prescribed burns with a Class Rating equivalent to that being applied for, and in which NRCS provides technical assistance. NRCS employees with extensive training, experience, and education in prescribed burning may provide supporting documentation to the State specialist to receive consideration for certification and job approval authority.

Burns planned with NRCS assistance must adhere to all Federal, State, Local laws and Tribal requirements regarding outdoor burning, fire control, smoke management, and air quality. Prescribed burns will be planned cooperatively and cleared through such groups as rural fire departments, county commissioners, county health officials, law enforcement offices, adjacent landowners, U.S. Forest Service, Bureau of Land Management, and other State forestry, wildlife, and natural resource agencies, as applicable. Landowners are responsible for obtaining all permits and clearances as required by law.

Prescribed burning plans must be developed for each identifiable prescribed burn and are valid only for the area and the burning season planned. If the landowner decides to change the location of the burn or is unable to burn during the prescribed time frame, a new plan must be prepared prior to conducting the burn.

For purposes of training landowners, managers, and other NRCS employees, properly trained and certified NRCS personnel may participate in the following activities:

(1) Serve as fire boss on burns within their design approval authority;
(2) Serve as team leader for the implementation and completion of burn;
(3) Direct field operations and make decisions, adjustments, and corrections necessary to ensure that the fire meets the planned objectives and that all participants are safe; and
(4) Assist with ignition of the fire.

The landowner or their designee must be on-site throughout the prescribed burn period. NRCS personnel will not serve as the landowner's designee. NRCS will not participate in the implementation of a prescribed burn while a countywide burn ban is in place unless a letter of approval is received from the county judge or commissioners' court.

STOP 5

Innovation with Fire

Patch-burn grazing experiments (D. Rollins)
Soil health—making cents of the science (M. Russell)
“Outside-the-box” applications (D. Rollins)
Embracing a fire culture (M. Russell)

Cattle grazing distribution on patch-burns at RPQRR

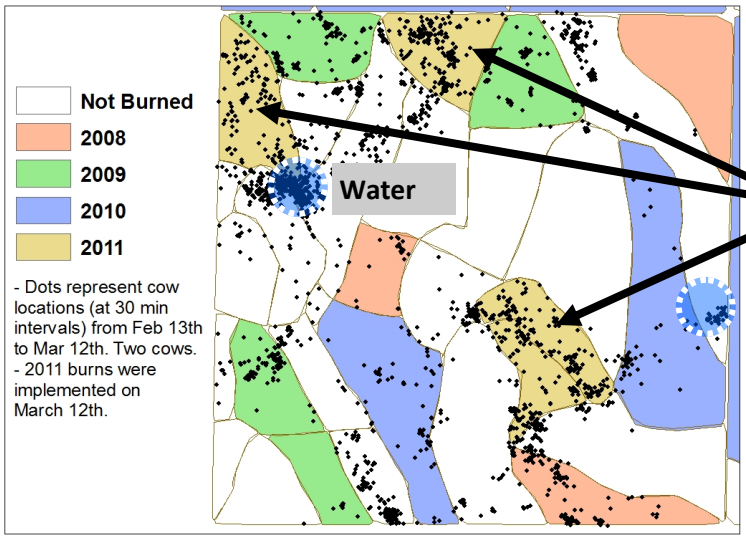
Dale Rollins, RPQRR; drollins@quailresearch.org

Patch-burn grazing (PBG) is the application of a combination of prescribed burning and grazing in order to achieve specific habitat management goals. Cattle are allowed to graze freely within a pasture, which has a patchwork of burned and unburned patches within it. The result is the cattle are attracted to freshly burned prickly pear and palatable and nutritious new growth that appears shortly after burning, and therefore tend to focus their grazing activity on those burned portions of the pasture. This selective burning and subsequent grazing results in a heterogeneous plant species composition and structure at the pasture scale. Based on patch burn grazing research on North American tall-grass prairies, we predict that this vegetative heterogeneity will benefit wildlife, including quail.

Our objectives in this PBG study are 1) to quantify pasture utilization over time by the cattle; 2) to quantify changes in forb, grass and prickly pear composition in response to burning and grazing; 3) assess the use of PBG as an effective tool for quail management ("quail-friendly); 4) quantify arthropod dynamics in response to PBG; and 5) quantify small mammal dynamics in response to PBG. The drought conditions of 2011 significantly altered spatial grazing patterns of cows relative to previous years. Cows were on-site during our grazing regime of Feb 13th to Jun 28th. During an average-high rainfall year cattle tend to graze within the recently-burned patches during the weeks immediately following the prescribed burns. This year, the cattle grazed the pasture relatively homogenously compared to recent years, and due to the very dry months this year tended to graze areas containing shinoak as a source of browse.

Funding provided by NRCS Conservation Innovation Grant and RPQRR.

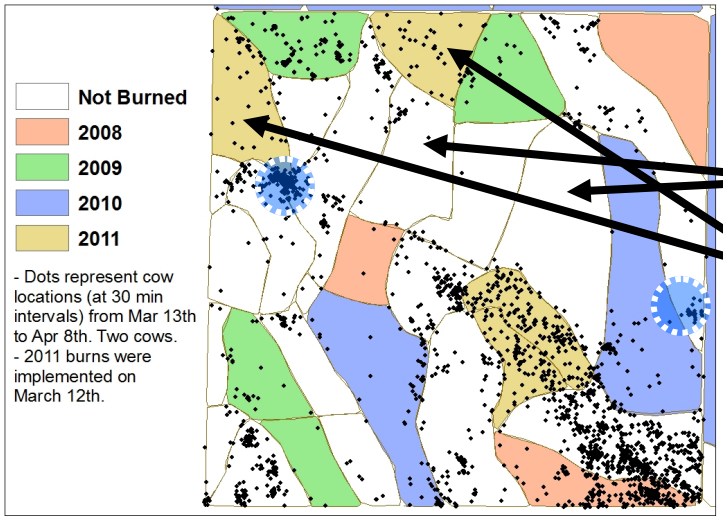
Ellie Patch Burns - Cow Locations (Feb 13 - Mar 12)



Pre-burn

- **Little use of previously burned areas**
- **Considerable use of all 3 polygons that were scheduled to be burned (lower right; tan-colored)**

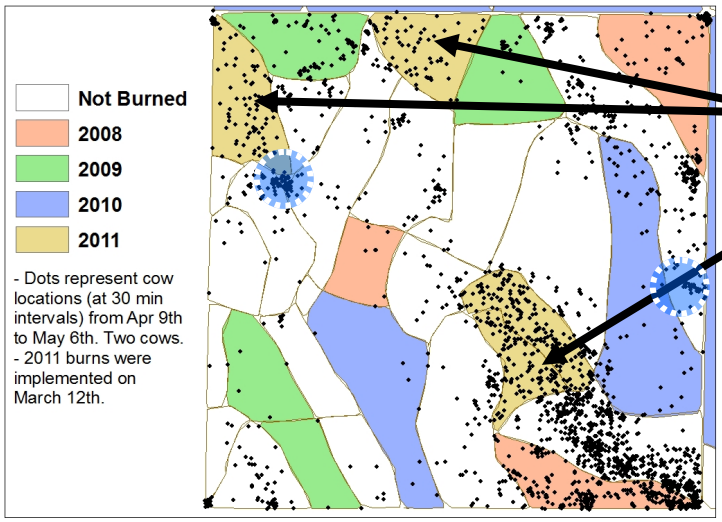
Ellie Patch Burns - Cow Locations (Mar 13 - Apr 8)



1-mo Post-burn

- **Congregation towards SE portion (sandy—shinoak)**
- **Note very little use of white-colored polygons (untreated) in upper central portion of figure**
- **Little use of 2 recently burned polygons in NW portion of pasture**

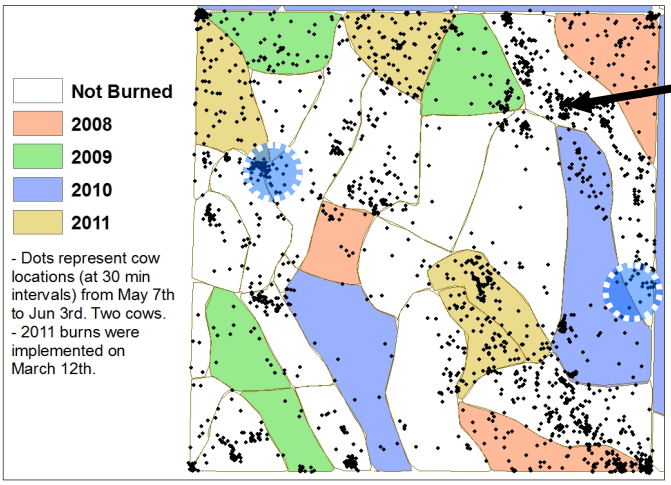
Ellie Patch Burns - Cow Locations (Apr 9 - May 6)



1-2 mos post-burn

- **Little use of previously burned areas**
- **Greater use of recently burned (prickly pear consumption?)**
- **Continued heavy use of polygons with shinoak**

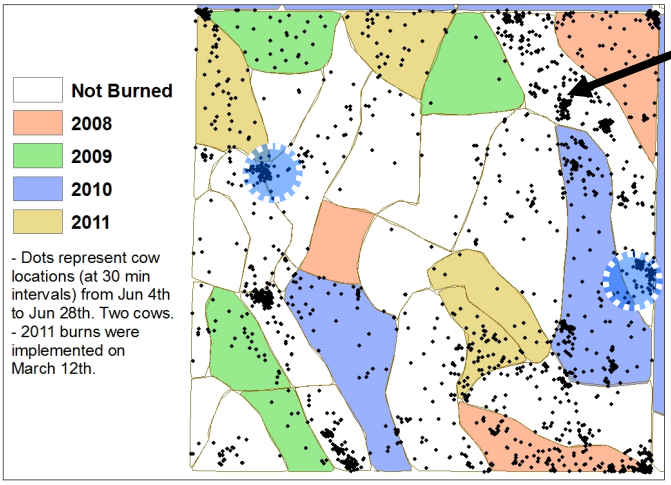
Ellie Patch Burns - Cow Locations (May 7 - Jun 3)



2-3 mos post-burn

- **Most uniform grazing to date**
- **Concentrations in riparian area (shade)**

Ellie Patch Burns - Cow Locations (Jun 4 - Jun 28)



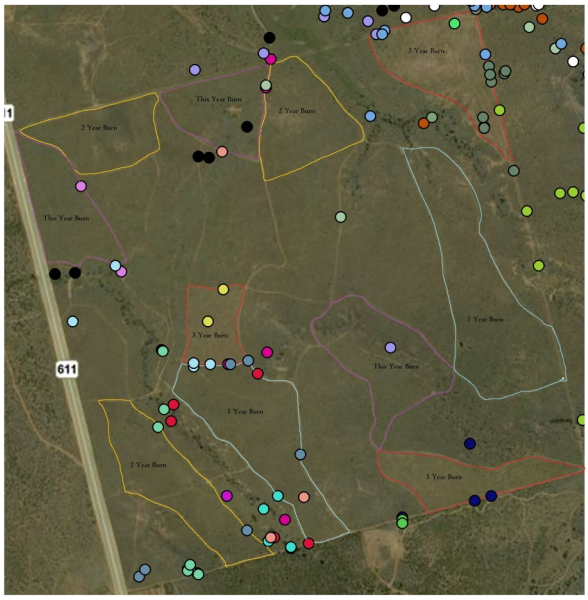
3-4 mos post-burn

- **Concentrations in riparian areas (shade)**
- **Most uniform grazing to date**

Quail Response to patch-burn grazing during drought

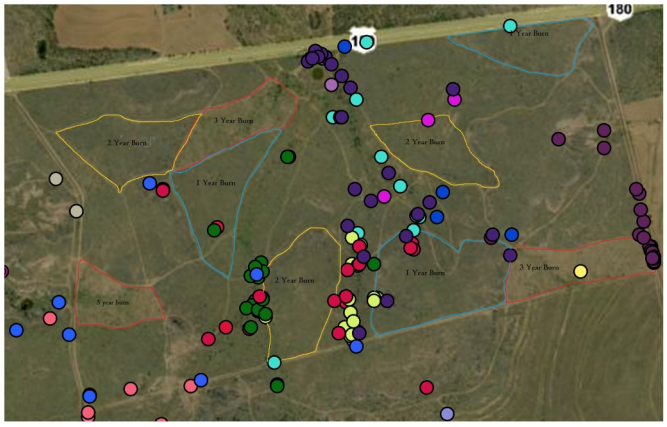
Barrett Koennecke, Christine Litton, and Shesh Jhala, RPQRR

As part of the Patch-Burn-Grazing Study we are also monitoring quail and their response to different burns. The attached maps show movement of quail throughout Ellie and Suzie from 2 Feb, 2011 through mid-Sept. Each quail is represented by a different color on the map. To date, quail have not exhibited any obvious preference for differently-aged burns. The only apparent selection is their tendency to reside mostly in riparian areas, probably because these areas afford better woody cover. Upon saying that, if the weather conditions are taken into account, (little rainfall, and high temperatures), it would make sense that birds do not spend much time in the burned areas where there is not much cover from the elements.



Ellie Pasture

- Few quail overall in this pasture
- Associated mainly with perimeter of pasture or riparian areas



Suzie Pasture

- Associated mainly with perimeter of pasture or riparian areas
- Little use of burned areas during 2011

Making cents of the science—Soil health considerations

Morgan Russell, Texas A&M Agrilife Extension Service, San Angelo;
morgan.russell@ag.tamu.edu

The overall effects of fire on ecosystems are complex and variable, ranging from the reduction or elimination of aboveground biomass to impacts on belowground physical, chemical and microbial mediated processes. Many producers utilize prescribed burning in order to decrease woody plant encroachment, increase rangeland condition, and improve overall ecological site resiliency. However, some land managers are inherently focused on the aboveground and immediate effects of fire, often times overlooking the belowground and long-term effects of fire.

Fire effects are felt firsthand belowground. Maximum temperature, duration of heat, and dosage of heat provide a unique heat signature that triggers belowground carbohydrate reserves of native, resprouting species. Not only does this heat signature provide a unique environmental cue, but 21 different minerals and nutrients have found to immediately increase 2-3X more compared to non-burned control treatments.

Following a prescribed burn we have found burning resulted in increases in soil surface NH_4^+, NO_3^-, inorganic N, Ca^{2+}, Mn^{2+}, and Zn^{2+}. Increases in NO_3^-, inorganic N, and Zn^{2+} were also observed in deeper horizons. Release of NH_4^+ from organic matter occurs during burning and decomposition of incompletely consumed above- and belowground biomass, and then NH_4^+ is converted to NO_3^- by soil microorganisms. The NO_3^- ion is highly mobile and easily moves down through the soil profile. The observed increases in the mineral cations Ca^{2+}, Mn^{2+}, and Zn^{2+} likely were due to deposition of ash onto the soil surface after combustion and incorporation into the mineral soil.

This application of the latest scientific advances that revolve around belowground assessments of fire effects will increase overall understanding of both direct and indirect effects further influencing the implementation of prescribed burning.

Some outside-the-box applications and observations

Dale Rollins, RPQRR; drollins@quailresearch.org

Don't try this at home!

The RPQRR is well-suited to accommodate some "responsibly adventurous" experiments with fire. The cotton fields along our east border provide a biological and political buffer for us to sometimes "push the limits" per traditional prescriptions. We don't always have 12-foot wide bladed firelines—we typically burn from two-track ranch roads, wetlines, or just using existing breaks in the fuel. We believe our crew's expertise and experience supplants the need at times to implement more costly firelines. I call it "burning on a budget." As of 2016, we've burned 70 "polygons" without incident. We strive to learn from each one.

We conducted several summer fires (Jul-Aug) in 2009-10. I had never done summer burns before and was quite apprehensive. But the fire behavior was quite docile given the air temperatures involved (95-100 degrees F). In July 2010 I had Dr. Butch Taylor and Ray Hinnant lined up to conduct a "burn school" for aspiring Certified Prescribed Burn Managers. The workshop was to be held the first week of August, and we received over seven inches of rain in July—everything was green as a gourd! The idea of having a burn school with no actual burns wasn't palatable to me, so I instructed one of the interns to spray several areas with glyphosate at 2– and 4-qts/ac using a boomless nozzle about three weeks prior to the school. When it came time to burn (5 Aug) we had brown islands in an ocean of green, good weather for a "growing season" burn, i.e., temperatures form 95 to 102, winds 5 to 7 mph from the SW, and RH from 22 to 30%. These "pretreated" burns were impressive, both in terms of their impacts on cactus and their relatively docile behavior. When they hit the "green wall" of non-treated fuel, they went out quickly; it was impressive.

The resultant plant community following those burns is worth noting. We attained an estimated 95% "kill" (not just pad reduction) on pricklypear. Six weeks, and a couple of good rains later, the burns were covered with saucer-sized Texas filaree. Deer trails from the neighboring ranch (some 400 yards away) were testament to their attraction. The following Sept (2011) these areas were dominated by broomweed (which we celebrated for quail's sakes). And for what it's worth, I've never seen the amount of one-seeded mercury (*Argythamnia* sp.) like that we observed following "pre-treated burns."

Who Started that Fire? Embracing a Fire Culture in 2016

Dr. Morgan Russell; Texas A&M Agrilife Extension Service, San Angelo;
morgan.russell@ag.tamu.edu

As the 2015-2016 El Niño period transitions back to La Niña, a question on every rancher's mind should be are we ready for the start of the next drought/wildfire season? Stocking densities haven't recovered from the last drought, and fuel loads across Texas and parts of the southwest are high due to the strong El Niño season. Producers should be feeling antsy about the (wildfire) fuel-loading problem that is in their pastures.

As rangeland managers we have the choice as to the type of fire that occurs in our pastures. Waiting for a wildfire is neither a good offense nor a good defense, similar to the old Marine philosophy, which mountain do you want to die on? It boils simply down to proactive vs. reactive attitudes and perspectives.

Wildfires burn out at prescribed fires, e.g.., the Bastrop Complex Fire in 2011 when wildfire severity and effects at Bastrop State Park were greatly minimized from a previously conducted prescribed burn in 2010. The presence of fire on a landscape determines its future. Nature benefits from either type of fire, but we suffer as producers from the damage done by fires we do not plan for. The planning for either type of fire ultimately determines a producer's future.

Early European ranchers had very little experience in semi-arid grasslands, and consequently, did not anticipate the adverse effects of overgrazing and fire suppression on rangeland structure and function. These management changes slowly transitioned native plant communities from savanna-grasslands to dense woodland communities. After almost a century of official and successful anti-fire campaigns, the benefits of conducting prescribed burns are gaining both scientific and cultural attention as a sound range management tool. Prescribed fire has been shown to be the most efficient and economical method for controlling invasive, non-sprouting native juniper. As an evolutionary process, fire cannot be substituted with any other management option and the combination of grazing and fire epitomizes the most natural symbiotic relationship on rangelands.

Prescribed fire in Texas and elsewhere faces an uncertain future. Historic use of prescribed fire by ranchers has never been widespread; however, with the rapid increase in population and increased "urbanization" of rangeland, air quality concerns, county officials quick to implement burn bans, new landowners who don't understand the ranching culture and lack the experience and background to appreciate the value of fire, etc., the implementation of fire will be even more difficult in the future.

However, these potential problems should not lessen our enthusiasm for prescribed fire. In fact, now is the time to become bold and innovative in the use of prescribed fire, but to also be prudent. Members of the Edwards Plateau Prescribed Burn Association in Texas have successfully burned approximately 1-million acres of rangeland. So, join a prescribed burn association, participate on other burns, and attend certified prescribed burn schools. It is my hope that this Fire Appreciation Day will "spark" a better understanding for the problems facing the continued use of prescribed fire, fan a greater appreciation for the future role fire should play in your region, and re-ignite the fire culture that manipulated such a basic, natural tool to historically make our rangelands both profitable and sustainable.

Thanks for attending today's FAD. We hope you (a) found the information timely, (b) had trouble hearing because of the whistling quail, and (c) feel empowered to be a responsible advocate for prescribed burning in west Texas.

"Our mission is to protect and conserve the heritage of wild quail hunting in Texas for this, and future, generations."

ROLLING PLAINS QUAIL RESEARCH RANCH

For additional information about the RPQRR, see our website at www.quailresearch.org. From there you can sign up for our monthly *e-Quail News* and "like" our Facebook page. Join us Friday, September 30 for our annual