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HORTICULTURE

Using Surface Water for Drip Irrigation

by Steve Upson / sdupson@noble.org

With the return of hot, dry weather to the Southern Great Plains, fruit and vegetable growers are trusting their drip irrigation systems to deliver the quantity and quality of water needed to sustain production throughout the summer.

Many growers have no choice but to rely on pond or stream water for irrigation because groundwater is too deep to justify the cost of drilling or the quality is too poor to be used for irrigation. When placed close to the bank of a pond or stream, a portable 5 to 10 horsepower gasoline-powered centrifugal pump is capable of delivering enough water to meet the moisture requirements of a few acres of drip-irrigated specialty crops. It is important that the pump is equipped with a non-collapsing suction line and appropriately sized strainer.

While pumping water from a surface water source is a fairly straightforward process, ensuring the water is of sufficient quality for use in a drip system is a different matter. As the summer progresses, surface water temperatures increase, causing a "bloom" in algae and phytoplankton populations. This increase in turbidity from aquatic biomass places increased demands on filtration systems.

Algae and phytoplankton "blooms" can occur during summer months due to elevated water temperature. Although these blooms can be controlled by chemical treatments, such additives are no substitute for good filtration.

Algae can be controlled in ponds by adding copper sulfate, chelated copper or sodium carbonate peroxyhydrate (Green Clean). Follow label directions for rate and timing of applications to ensure product effectiveness and to avoid harming fish. While chemical treatment may be effective in reducing algae populations, it should never be viewed as a substitution for filtration.

Media (sand) filters are preferred over screen or disc filters when using surface water for irrigation because they are more efficient at removing biological contaminants. Media filters should be backflushed when pressure gauges, located at the filter inlet and outlet, indicate a 5 psi difference.

The use of white PVC pipe and pipe fittings in irrigation systems can be problematic if the water source is surface water. Enough light can ▸

penetrate the walls of white PVC pipe to enable the proliferation of algae. Because of this limitation, all PVC pipe used in main lines and header lines should be buried. In applications such as vegetable plasticulture where header lines are located on the soil surface to permit removal for field preparation, a better choice is black polyethylene (HDPE) tubing or layflat hose.

Even with the best filtration system, it is impossible to exclude 100 percent of algae and other microorganisms from entering a drip system. Consequently, growers should be prepared to chemically treat water after passing through the media filter. For the majority of small-scale fruit and vegetable growers, this is best accomplished using a chemical (fertilizer) injector to inject chlorine bleach. Chlorine is a powerful oxidizing agent and, when injected into an irrigation system, destroys biological contaminants.

Chlorine can be injected continuously to prevent the growth of algae or once a week as a "slug" treatment to remove any algae that may have begun to build up in the system. The chlorine injection rate is greater for slug treatments compared to continuous treatments because the amount of algae and other biological contaminants in the irrigation water is greater. For chlorination to be effective, a concentration of 1 to 2 ppm of chlorine should be maintained in the system for 30 minutes. A swimming pool water tester can be used to determine irrigation water chlorine levels. To ensure that all parts of the system receive a minimum 30 minutes of contact time, chlorine should be injected for one hour.

Last, but not least, don't underestimate the importance of flushing your drip irrigation system on a regular basis. Even a system equipped with a properly maintained and managed filter and injector requires occasional flushing to ensure peak performance. To eliminate as much contaminant from the system as possible, always flush the main line first followed by the sub mains, header lines and drip lines. In order for flushing to be effective, the velocity of water flowing from the end of each drip line must be 3 feet per second or greater. For example, a drip line held 1 foot above the ground with a stream that travels 8 inches before hitting the ground has a flushing velocity of 3 feet per second. With most systems, only a few drip lines can be flushed at a time to achieve the desired flushing velocity.

Drip irrigation offers many advantages over other types of irrigation delivery systems. However, because drip emitters are very susceptible to clogging, attention must be given to water quality. Surface water is a viable option for drip irrigation when proper filtration, chlorine injection and flushing are used. For more information on maintenance of drip irrigation systems, including guidelines for chlorine injection to control algae, refer to the Kansas State University publication *Maintaining Drip Irrigation Systems* (www.ksre.ksu.edu/library/hort2/mf2178.pdf). ■

July Is the Time for Pecan Leaf Sampling

by Charles Rohla / ctrohla@noble.org

This article is excerpted from one that appeared in the June 2010 Ag News and Views *newsletter.*

Nutrient management is essential for a successful pecan orchard or grove. Leaf tissue is sensitive to changes in nutrient supply and can serve as an indicator of both limiting and excess nutrients. To ensure accurate analysis, the following procedures should be followed. In addition, samples should be collected from trees located in distinct areas of the orchard or grove to account for different soil types, management strategies and varieties.

Procedure for taking leaf samples:

1. Collect samples in July.
2. Do not mix varieties unless management for the area will be the same.
3. Collect 100-150 middle pairs of leaflets from the middle leaf of the current season's growth (Figure 1). Avoid leaves in the interior of the tree and from suckers, water sprouts or leaflets damaged by insects or disease.
4. Do not use galvanized containers, rubber gloves or rubber sponges to collect, carry or store samples.
5. Remove spray residue and dirt by washing or dipping the leaves in tap water for less than one minute.
6. Dry leaflets after washing by spreading them out to air dry until they will crumble. Do not expose them to direct sun or allow exposure to heat while drying.
7. Place dry leaflets in a paper sample bag for transport. Do not send wet leaves or use plastic ziplock bags. Accurately and completely identify each sample including the age and variety (improved or native).

See the full 2010 article at: www.noble.org/ag/horticulture/pecansampling ■

Making More With Fewer Cows

by Robert Wells / rswells@noble.org

Cattle producers in the Southern Great Plains had to reduce cow numbers in 2011 due to the most severe drought in decades. Replacement cow prices are at an all-time high in 2012, and most pastures are still in poor condition, making it difficult for many producers to restock to former levels.

Producers often have a financial goal – obtaining a certain amount of revenue from the ranch that allows them to pay all the bills. With fewer cows on the ranch, it can become more difficult to fill the financial gap. The high market prices being paid for weaned calves have helped to overcome some of the financial gap, but not all of it. So how can a rancher bridge the financial gap if they don't have as many cows on the ranch as usual?

Part of the answer lies in stacking value-added traits to the calf crop and front-loading the calving season with as many early-born calves as possible.

When prices are as high as they are now, it is easy to forego any additional management. You can likely do nothing and still make more per head than you ever have before. But, rather than taking this approach, adding valuable traits to the calf can allow you to make even more money than before. Some traits a producer should take advantage of are castration, dehorning, vaccinations, deworming the calves and cows, and backgrounding the calves after weaning. Numerous articles have been written about this subject in recent years. Most suggest that a producer can increase the value of a weaned calf from $5 to $20 per hundredweight sold.

An additional way to increase profitability is to have as many cows calve within the first 30 days of the calving season as possible. This can be achieved by using estrus synchronization techniques or simply by purchasing females that will calve in the first 30 days of the calving season. The included table shows that a shorter calving season with a majority of the calves born early can increase gross revenue over 11 percent in a herd with 50 calves.

When the ranch still has the same number of bills to pay and fewer cows to do it with, it becomes even more important to add as much value as you can to each calf sold. The $4,700 increase in gross revenue in this example does not include the added value of the calves if you stack the value traits previously mentioned.

With a little thought and work up front, ranchers can increase the profitability of the ranch even when they have fewer cattle than before. This will help bridge the financial gap caused by not having as many cows on the ranch. ■

Shifting a calf crop to more early calves

Typical Calving Interval, 120 days

Calving interval, days	Percent calves born in each interval	Number of head	Age at weaning	Weight per day of age	Total pounds weaned
1-30	20	10	213	2.78	5,912
31-60	30	15	183	2.84	7,788
61-90	35	17	153	2.92	7,602
91-120	15	8	123	3.05	3,002
Total pounds weaned					24,304
Total value of calf crop sold*		@	$1.65/lb		$40,065

Ideal Calving Interval, 90 days

Calving interval, days	Percent calves born in each interval	Number of head	Age at weaning	Weight per day of age	Total pounds weaned
1-30	60	30	213	2.78	17,736
31-60	30	15	183	2.84	7,788
61-90	10	5	153	2.92	2,236
Total pounds weaned					27,760
Total value of calf crop sold*		@	$1.61/lb		$44,769
Difference between scenarios					$4,703

**Prices determined for an Oct. 15, 2012, sale date using forecasting tools at http://www.beefbasis.com*

Continuing Repercussions of the 2011 Drought

by Chuck Coffey / crcoffey@noble.org

I don't like talking about the "D-word," but the effects of the 2011 drought will be felt for years to come throughout the Southern Great Plains and the Southwest due to its severity. Limited rainfall and record heat forced the liquidation of livestock, the likes of which most of us have never seen in our lifetimes. Only the most astute land managers will recover quickly, while the majority will experience lasting effects. It may take as many as three to five years for some to fully recover and that is only if we see good years along the way.

On May 24, 2012, Gary McManus, associate state climatologist with the Oklahoma Climatological Survey said we were experiencing a "flash drought." Warm temperatures, limited precipitation, windy days and a tremendous flush of cool-season annuals worked together to rapidly remove most of the stored moisture from the soil. This combination does not bode well for the months to come. Looking at rainfall for May, south-central Oklahoma was 48 percent of normal, while the state as a whole was only 34 percent of normal. May 2012 was the fourth driest on record. Consequently, much of the state is designated as abnormally dry, which could rapidly worsen to moderate or severe drought if the trend continues. Figure 1 shows the percentage of normal rainfall Oklahoma received in May.

How can this be with all the rain we received from October through April? Here's what I think happened. From a plant's perspective, drought means slow growth or no growth. Therefore, nutrients, such as nitrogen, in the soil are not used during periods of drought and accumulate until the next rain. When we began getting rain in October of 2011, it was too late to grow warm-season perennials like bermudagrass and native grasses, while the cool-season annuals such as ryegrass and wheat took full advantage of one of their best growing seasons ever.

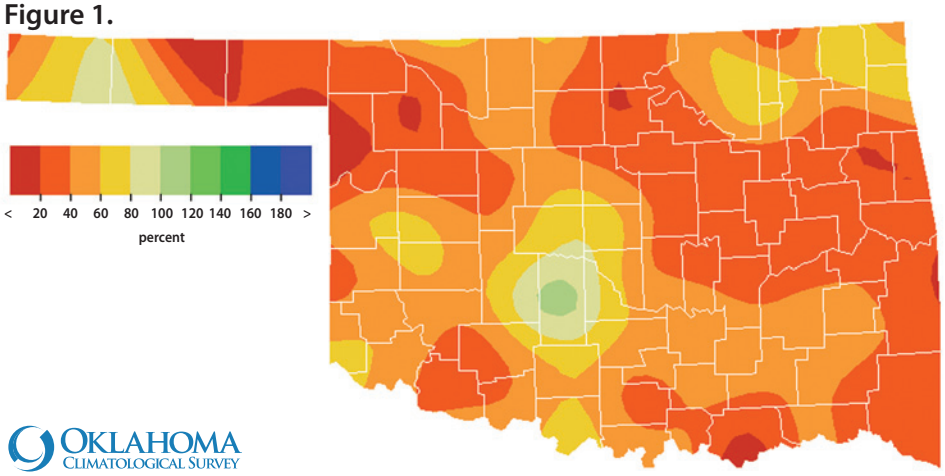
Although this flush of winter grass was a welcomed relief to the drought, its effects have been deleterious to the growth of warm-season perennials thus far in 2012. The cool-season forages used up available soil moisture and nitrogen, and competed against our warm-season forages. This caused the warm-season grasses to emerge later than normal in their production cycle, even though we have had what most would consider an early spring. It doesn't matter how much it rains during the winter, we still don't grow much summer grass if it doesn't rain in May and June.

What next? Drought, at least a seasonal one, should be expected in 2012. Even if it does begin raining, most of us will not see warm-season forage growth anywhere close to normal. So please make plans now for the remainder of the year.

Early weaning is one of the first lines of defense as it drastically reduces a cow's intake of both forage and water. Many have already culled their old and unproductive cows, and could be forced to begin liquidating some of their productive females in 2012. If selling cows is not one of your strategies, then secure hay resources now and plan to feed for at least six months during the fall and winter of 2012-2013.

This spring's illusion of unlimited grass is rapidly fading, and the summer of 2012 will once again prove challenging if we don't start getting above-normal rainfall. ■

Figure 1.



Taking Agricultural Education to Iraq

by Jim Johnson / jpjohnson@noble.org

In the summer of 2011, I was preparing to go to Iraq – not as a soldier, but as an agricultural consultant. More specifically, I was going to Erbil, in the Kurdish region of northern Iraq, to teach crop residue management for a week. This fit me well since I have a strong interest in no-till crop production. The Noble Foundation was established with the challenge to "benefit mankind," so the mission also matched the vision of our founder, Lloyd Noble.

I knew very little about what to expect. I had been told three things: I would have "students" who were the equivalent of agriculture extension agents in the United States; most crops grown in Oklahoma would grow there; and the weather would be hot.

As the plane landed, the scenery reminded me of western Oklahoma. There were miles of fields of wheat stubble, parched-looking pastures and rolling hills leading to some low mountains. The weather was hot and dry. I felt right at home.

I was surprised by the green vegetation as we drove from the airport into town. Where I expected desert, there were trees, lawns, shrubs and gardens. I had the opportunity to tour the area for a day before class started and learned that they raised hard red winter wheat, barley, corn, soybeans, sesame, grapes, olives, almonds, peaches, melons, tomatoes, sheep, goats, chickens and cattle. I was also surprised to see a small amount of modern equipment, such as combines, tractors, no-till drills and center pivots, that had been manufactured all over the world.

Jim Johnson (third from the right, back row) poses with a group of Iraqi agronomy students during the summer of 2011.

On the first day of class, 15 students arrived. They were all agronomists from Kurdistan, an autonomous region in northern Iraq. Some had recently graduated from college while others had been in agricultural extension and research for many years. I discovered that my students had plenty of "book" knowledge, but limited real-world experience.

Agriculture in Kurdistan had been in disarray for decades. A new era of agriculture began after the fall of Saddam Hussein in 2003. They were now experiencing much of the same growth and progress in agriculture that we experienced in the United States in the early 1900s.

The week was filled with assignments, demonstrations, discussions, lectures, questions and tours, and it was gratifying to see the participants experience little "aha" moments during our sessions. For instance, traditional wheat farmers in the region harvest the grain, then, to make a few extra dollars, bale and sell the remaining wheat straw. What the students had not considered was the value of the nutrients leaving the field along with the straw. These lost nutrients are worth four times more than the small amount of revenue obtained from the straw.

While the students were eager to absorb new information, they were not the only ones learning. I soon realized that the United States does not have the market cornered on agricultural innovation. I saw equipment of which I had never dreamt. I met farmers who were rapidly adopting modern technology. This country that I knew almost nothing about was, in many ways, very similar to Oklahoma. They have the same motivations we have: hope of a better life for their children; dreams of peace and prosperity; and wishes for a good crop with each planting and harvest season.

If you ever have the opportunity to experience the people, culture and agricultural practices of another country, I strongly encourage it. In the end, you may realize that, deep down, we are not so different after all. ■

USDA Rainfall Insurance Protects Against Dry Weather

by Job Springer / jdspringer@noble.org

Farmers and ranchers can control many aspects of the farm or ranch business. For instance, a rancher can dictate the calving season, controlling when and how their cattle are bred. They can determine what types of health care programs their cattle receive and the types of forages used for grazing and hay production. However, one production variable that ranchers have no control over is the weather, which creates substantial production risk.

In Oklahoma and Texas, dry spells and prolonged drought create the greatest threat of production risk for cattle producers. During dry spells and drought, available forage becomes scarce and sometimes nonexistent. Consequently, baled hay becomes very expensive. In some cases, it becomes too expensive to purchase, forcing ranchers to reduce cattle numbers.

In response to the production risk caused by dry weather and prolonged drought, a relatively new program sponsored by the Risk Management Agency (RMA) of the United States Department of Agriculture (USDA) provides pasture, rangeland and forage insurance for pastures that are grazed or used to produce hay. The programs are based on either a vegetation index or rainfall index. This article focuses on the potential benefits and costs associated with the rainfall index, the index used by RMA for ranchers operating in Oklahoma and Texas.

How does the program work?

Base land production values for hay and pasture are assigned by RMA for each county in terms of dollars per acre. Producers determine the value of their hay and pasture acres compared to the county base value, choosing between 60 and 150 percent. Then producers decide what percent of normal rainfall they would like to insure. The producer can choose a percent of normal rainfall between 70 and 90. Finally, a decision needs to be made on which months to insure the property. The insurance is taken out with an approved private insurance company in two-month intervals with a minimum of two intervals for a single year.

The rainfall index is based upon a rainfall grid system, with each grid being approximately 12 miles by 12 miles. Normal rainfall for each grid is based upon records that date back to 1948. For each two-month interval, if the rainfall was below the specified percent of normal, a payment is mailed automatically to the rancher within 60 days of the end of that period.

Who should use this product?

Normally, insurance products do not make financial sense long-term if a rancher can meet the cash flow needs of the enterprise in the short run. However, every producer that has land that is used for grazing or hay production should consider using this insurance product because a substantial portion of the premium is subsidized by the USDA. The subsidy ranges between 51 and 59 percent of the total premium, depending on the percent of normal rainfall chosen to insure by the rancher.

Where to get more information?

There is an Internet-based tool available that shows farmers and ranchers what the program would have paid them in previous years for different coverage levels had they participated in the program. The tool can be found at http://agforceusa.com/rma/ri/prf/maps. The deadline for participation in this program is September of each year, so I strongly encourage anyone who is interested to give me a call at (580) 224-6443 or email me at jdspringer@noble.org to get more information about this insurance program. ■

Summer Grazing Deferment for Prescribed Burns

by Ken Gee / klgee@noble.org

Late winter-spring burns are probably the farthest thing from your mind in the middle of the summer, but planning for an adequate fuel load is necessary if future prescribed burns are to accomplish your goals. Most rangeland burns rely on fine fuel made up predominantly of warm-season grasses for combustion to create the desired impacts. As such, adequate "standing dead" grasses must remain in the field to serve as fine fuel until the time of a prescribed fire.

So what is an adequate fuel load? The answer depends on the goal(s) set for a prescribed fire, but generally ranges between 1,000 and 4,000 pounds of dry matter per acre (see examples). Fuel loads greater than 2,000 pounds per acre are usually required for successful "brush control" fires, while fuel loads near the lower end often result in very patchy burns. Environmental factors such as wind speed, relative humidity and air temperature also factor into the fire's behavior and the performance of any given burn.

Many prescribed burns require season-long grazing deferment for adequate fine fuel production and accumulation. However, with adequate precipitation, some early grazing can be allowed on productive sites. If an area to be burned is grazed, it is important to remember that most native warm-season grasses in the Southern Great Plains generally produce 75 percent of their biomass by mid-July. Of course, the actual growth curve varies from year to year with precipitation amount and timing.

Much of the warm-season forage or fine fuel removed through grazing after this time likely will not be replaced by additional growth. Therefore, to ensure adequate fuel loads for an upcoming winter-spring burn, most pastures in a planned burn area should be deferred from grazing after mid-July. Pastures that are grazed after this period should be monitored very closely to prevent removal of too much fine fuel. ■

The photos show examples of different fuel loads. Photo A shows a pasture with 600 pounds of dry matter per acre. The pasture in Photo B has 1,400 pounds of dry matter per acre – within the 1,000 to 4,000 pounds per acre range that is generally desired. Photo C shows a field with 2,400 pounds per acre of dry matter. Brush control burns usually require more than 2,000 pounds of dry matter per acre.

CONTENTS

EVENTS

Hunter Education Course
Date: July 21, 2012
Location: Southern Okla. Technology Center, Ardmore, Okla.
Time: 8 a.m.-5 p.m.
No Registration Fee

Winter Pasture/Stocker Seminar
Date: July 24, 2012
Location: Noble Foundation Kruse Auditorium
Time: 1 p.m.-5 p.m.
No Registration Fee

Pecan Workshop (two dates and locations)
Aug. 9, 2012; Mid-America Technology Center, Seminar Center, Wayne, Okla.
Aug. 16, 2012; North Central Texas College, Little Theatre, Gainesville, Texas
Time: (both events) 1 p.m.-4 p.m.
No Registration Fee

For more information or to register, please visit www.noble.org/agevents/ or call Tracy Cumbie at 580.224.6292. Preregistration is requested.

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