Dubois County Soil & Water Conservation District

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Spring, 2020

The Conservation Conversation

Mine Reclamation Roundtable

On February 10th, a group of approximately 40 people gathered at Mill Creek Farm for a round-table discussion about farming on recently reclaimed mine ground. Mark Anson, a farmer from Monroe City, Indiana, shared anecdotes and facts gleaned from his soil's own health journey. Jeff Coats, retired from the NRCS, explained some of the federal programs available to assist farmers with planting cover crops on reclaimed mine ground. The top five take-aways are:

1) **Avoid tillage. Soils that have been highly disturbed typically lack the structure of healthier soils.**
2) **Add highly mycorrhizal cover crops early. Oats are great for this or add a mixture of oats and peas.**
3) **Soil tests can be thrown off due to the mixing of soil horizons.**
4) **Consider planting wheat followed by a warm season cover crop. This method does amazing things to the soil.**
5) **Use manure or compost in conjunction with cover crops.**

Radius Weisman, 75, of Jasper passed away at 6:38 pm on Friday, March 20th, 2020 at Memorial Hospital and Health Care Center in Jasper. He was a 1962 graduate of Ireland High School. He then received a bachelor's degree in agriculture from Purdue University. He was a member of the United State Army National Guard. He retired from the **Farm Service Agency**, where he had been the executive director. He then worked part-time for **Dubois County Soil and water Conservation Service.**

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Climate change is affecting the health of agricultural soils. Increased heat and drought make life easy for the pathogenic fungus Pythium ultimum. As an international team of researchers lead by the University of Kassel and Bonn have shown, the fungus causes almost total crop failure in peas after a hot and dry stress event. Short-term soil recovery seems to be possibly only in exceptional cases. The study has now been published in the journal Applied Soil Ecology.

Pythium ultimum is an aggressive fungus that is transmitted though the soil and infects the roots in the seedling of important agricultural crops; such as, beets and peas but also corn, soybeans and potatoes. The plants develop root rot and die.

"In some cases, there may be a total failure of the germinating seedlings, " states Dr. Christian Bruns of the Section of Organic Farming and Cropping Systems at the University of Kassel.

However, soils also have protective certain fungi that act like 'bodyguards' and microorganisms parasitize the harmful fungus. The scientists took soil samples from very different locations in cool and damp Scotland, temperate northeast Germany, and dry and warm eastern Hungary. The soil samples; including the microorganisms living there, were put under stress in climate champers with heat (40 degrees Celsius) and drought (only half soil moisture) and then infected with the aggressive fungus Pythium ultimum. The researchers investigated the effects of this stress event on the pathogen and ultimately the plants by subsequently sowing peas in these pre-treated soils. The effect was dramatic.

"Only a few of the young pea plants survived, and these withered under the fungal attack," summarizes Prof. Dr. Thomas Doring from the Aroecology and Organic Farming Group at the University of Bonn. In all soils, the stress event of heat and drought led to a strong reduction in resistance to Pythium ultimum. Soils from Scotland suffered the most and those from Hungary the least.

"Apparently the protective microoganisms in the soils of cool, damp Scotland are less adapted to heat and drought than in Hungarian soils, which are often exposed to high temperatures and droughts in summer," says Doring.

The scientists investigated how well the various soils can recover by taking a break of several weeks after treatment with heat and drought before infecting the soil with the harmful fungus and sowing the peas. While a soil sample from Scotland showed some recovery, with slightly more peas growing in it in comparison, the harmful effect of the fungus seems to be made worse by the recovery phase in the samples from Hungary.

"The decisive factor seems to be how quickly the protective microorganisms are able to reproduce after the stress event," says Bruns, referring to the results of other studies. "This ability is apparently not so pronounced in the soil samples from Hungary." Soils that are highly resistant to drought and heat therefore, do not seem to have such a high recovery capacity.

More information: Thomas F. Doring et al., Applied Soil Ecology (2002), provided by University of Bonn.

Climate Change, Purdue University Report

Successful farming depends on our climate. Indiana has long been one of the nation's leaders in agricultural productivity. Favorable temperatures and precipitation help Indiana farmers generate over $31 billion worth of sales per year, making the state 11th in total agricultural products sold.

Changes to the state's climate over the coming decades, including increasing temperatures, changes in precipitation amounts and patterns, and rising levels of carbon dioxide (CO2) in the air will result in several direct and indirect impacts to the state's agricultural industry. The Indiana's Agriculture in a Changing Climate, a report from the Indiana Climate Change Impacts Assessment (IN CCIA) describes how projected changes in the state's climate will affect the health of livestock and poultry, growing season conditions for crops, the types of crops that can be planted, soil health and water quality as well as weed, pest, and disease pressure for agricultural projection statewide.

Indiana once was home to traditional mixed farming operations that integrated livestock, grain, forage, fruit and vegetable production. That changed significantly in the 1970's when economic trends led to larger farm sizes. Today, Indiana farms are more specialized and larger than in the past, making them more vulnerable to climate related risk.

Shifting climate patterns have indirect effects on agriculture, too, through altered patterns and prevalence of weeks, pathogens, insects, and invasive species. Agricultural production involves complex interactions among multiple integrated systems, with weather affecting management and planting decisions that, in turn, affect soil health and long-term sustainability.

Over the last century, Indiana has become warmer and wetter. Average temperatures have risen 1.2 degrees Fahrenheit and annual precipitation has increased by 5.6 inches. These trends are expected to continue and accelerate in the coming decades.

Purdue University, Agricultural Report, 7/31/2018

Land Use in the Dubois County Flood Plain (2010)

Land Use Type	Acres in the Flood Plain	Percent of Total Acres
Agriculture	38,587	82%
Developed	4,030	9%
Forest ad Vegetation	637	1%
Wetland	3,899	8%
Total Acres in Floodplain	47,153	100%

Envirothon and Spring Time Evaluation of your Woodland

Through the National Conservation Foundation (NCF)-Envirothon, individuals gain an understanding of the complexities of balancing quality of life with conservation of the environment and become citizens eager to continue support this healthy balance.

In 2019, an estimated 25,000 students competed across the U.S., Canada, and China throughout the spring in local, statewide, and provincial competitions. Following months of preparation with volunteer advisors and educators, the five-person teams were tested on their knowledge across the categories of soils and land use, aquatic ecology, forestry, and wildlife. Throughout the year, the teams worked to understand the concepts, science, tools, and complexities that lie within each of these categories; as well as, the 2019's environmental issue, "Agriculture and the Environment: Knowledge and Technology to Feed the World".

The Envirothon is one of the premier programs to educate the next generation of conservation leaders. Students can choose natural resource careers including environmental studies, biological and agricultural engineering, soil science, geology, and parks and recreation. The Dubois County Soil and Water Conservation District supports the Envirothon program that is relevant for our time to inspire and educate the next generation on the importance of conservation and natural resources.

On March 10th, 2020, the Southwest Regional Envirothon competition was held at the Warrick County Fairgrounds. First place went to Gibson Homeschool Team #1; Second place went to Southridge Team #1, and Third place went to Forest Park. These teams were eligible to attend the state competition. On March 20th, a letter was received notifying the teams that the state and national competitions were cancelled due to the Covid-19 virus pandemic. Several factors are considered when determining the need to postpone or cancel the state competition. It is important to keep students, staff, and volunteers safe and not further exposed to this virus.

Early spring is a great time to evaluate the health and condition of your woodlands, before heavy leaf cover and humid temperatures discourage all but the hardiest souls. As you increase your outdoor activities, there are many thing to take note of:

1) **Storm Damage: Watch for broken branches, excessive damage by ice storms, and erosion at designated stream crossings and on trails.**
2) **Insect Damage.**
3) **Drought Impact: If your trees are impacted, consider having a select timber harvest in your woods to capture their value.**
4) **Invasive Plant Inventory: Map their locations and research appropriate control methods.**
5) **Walk the boundaries: Purple Paint law allows you to mark your land with same legal effects as using a *No Trespassing sign*.**
6) **Practice your winter tree identification skills.**
7) **Watch for tick activity as temperatures increase.**

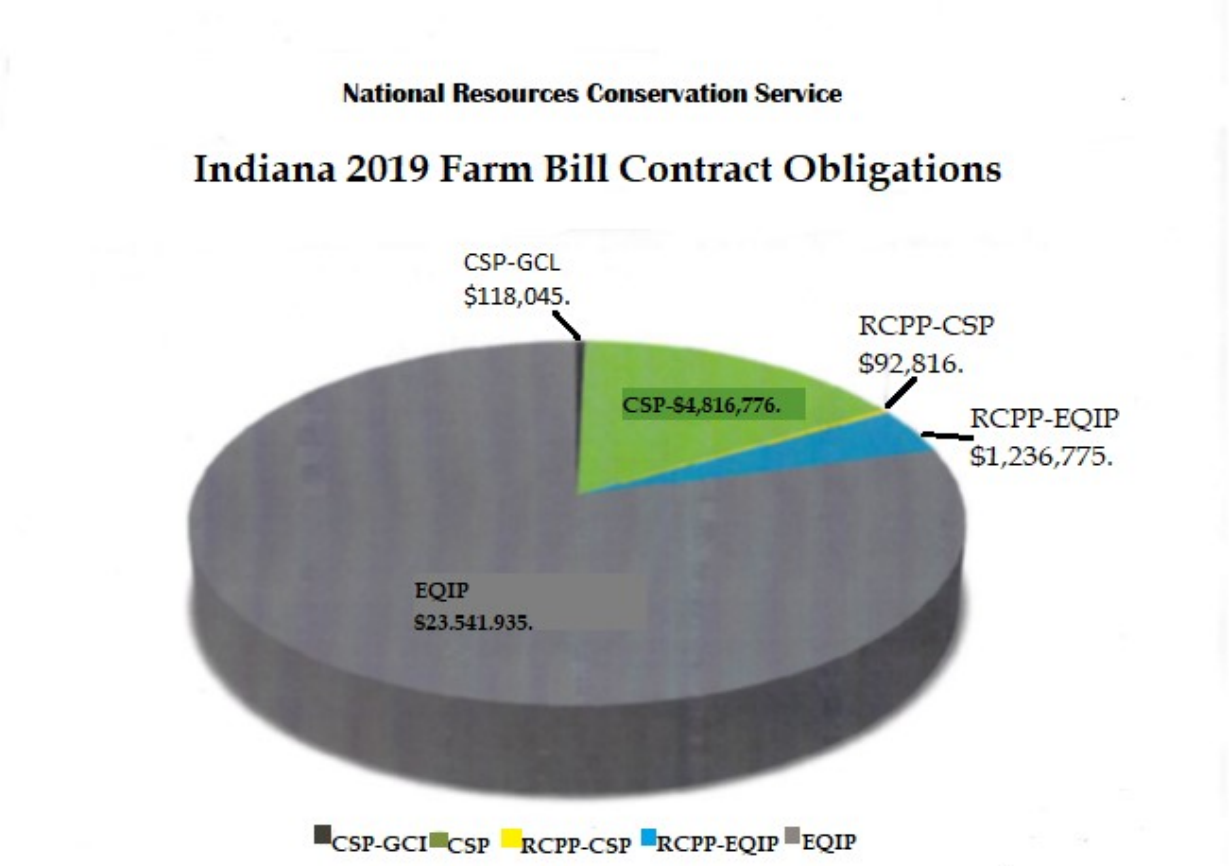
If you determine that you need help evaluating your woodlands, consider hiring a private consulting forester.

A list can be found at: *www.finindianaforester.org, by Don McGuckin, Woodland Steward*

On February 11th, during the Indiana General Session, Matthew Lohr, with Natural Resources Conservation Service (NRCS), addressed attendees. He talked about the importance of collaboration and recognizing every individual when it comes to creating conversation and taking action. He recognized the hard work of Soil and Water Conservation Districts and the crucial role that public service plays in creating change.

"Every person matters," Lohr said. "Figure out how you can go above and beyond in every day challenges and encounters."

Lohr was also the keynote speaker at the Indiana Association of Soil and Water Conservation Districts Annual Conference in January. He is the 16th Chief of USDA's NRCS and provides leadership for NRCS and its mission to support America's farmers, ranchers, and forest landowners in their voluntary conservation efforts though a network of more than 3,000 service centers in communities nationwide. As a fifth generation farmer, he has spend his life working for the betterment of agriculture and stewardship on working lands. His full time farm includes poultry, beef cattle, row crops and sweet corn. The graph below illustrates how much and where the Indiana Farm Bill monies were distributed.



Grazing Bites by Victor Shelton, March, 2020

We got a bit too far into numbers and math last issue, but understanding grazing math is important and powerful information and can certainly impact your bottom line. You certainly don't want to wait until this time of year to find that you don't have enough winter feed so we must constantly be looking ahead.

There is more than one way to reduce the amount of hay or winter feed needed and we probably need to take advantage of them. We've discussed some of these before; such as, the use of crop residue, cover crops, annuals of all kinds and stockpile, of course. I can't stress enough that this does require thinking ahead.

The biggest advantage, which can produce nice dividends, is getting livestock off pastures in late summer and keeping them off as long as possible. You are able to do this IF you have somewhere else you can go with the livestock. This doesn't mean letting them "accidently" roam over onto your neighbor's farm, but honestly that could be a viable option…with permission of course.

If you can get the grazing livestock off the pasture early, say late August or early September, then that deferment of pasture use provides a wonderful recovery period, capturing the last part of the growth curve for cool season forages and allowing for a lot more forage growth that can be used later in the late fall or winter or even going into spring.

The first opportunity to move the grazing livestock to somewhere different could be very early, even as early as late July. That is possible when a summer annual or mix is planted directly after a wheat crop. Some people don't think about all the possible options that could come from utilizing a nearby, or better yet, connecting crop field. Double crop soybeans are not always the best option or even feasible after wheat, especially above Interstate-70.

Utilizing a summer annual mix after wheat instead of double crop soybeans can provide several benefits besides high yielding quality forage for livestock. They can certainly reduce erosion potential of the field, improve soil structure from adding massive amounts of roots and those roots create passages and pore spaces to allow increase moisture percolation and aeration of the soil and also help increase soil organic matter. You also can't forget about the diversity that is being added into the cropping system and soil microbiome either.

Could the feed value of that summer forage be worth more than the soybeans harvested after inputs? Yes, that is very possible. How quickly you can start grazing the annuals will depend on the species and moisture but can sometimes be within just a few weeks of planting.

The next best option arrives or could possibly arrive mid to late August or early September depending where you are located and if you are cutting silage. If you are cutting silage, then it's pretty much a no brainer; you have plenty of time to get an early fall annual forage or cover crop planted.

I will side track here briefly to point out that annual forages and cover crops could be pretty much one in the same, but the main difference being annuals planted for just forage or grazing are not true cover crops of which have primary goals of erosion control, weed suppression, and soil health.

That doesn't mean that you can't achieve some of the same benefits. You can, but management of that vegetation is the difference. Back to the post silage scenario. Generally, because silage corn is chopped much earlier than corn for grain, you have ample time to get annuals planted and get tremendous growth off them for early grazing. A combination such as oats, a brassica such as a turnip or rapeseed, and cereal rye or triticale, works great planted then. The earlier they are planted, the greater the opportunity for moisture and growth.

With enough moisture and time, the brassica and oats can provide an enormous amount of early fall forage to graze. The oats and brassica come on strong with enough nutrients and moisture for possibly September to December grazing options. The cereal rye or triticale is laying quietly underneath and it takes off early spring, creating another possible grazing opportunity if you have good soil conditions.

A crop field that is no-tilled continuously, and especially with cover crops or annuals for grazing, will normally holdup better for grazing than one that has been tilled. On a tilled field, the livestock, especially cows, will more likely pug up the site to the depth of the tillage. Fields where natural soil aggregation has been maintained or built back have more air and infiltration because of that structure and thus are able to be more resilient to grazing. If carefully managed, the field can still be successfully no-tilled after the grazing event. Part of that management is not grazing during excessively wet periods, not feeding on the cropland, and not lingering any longer than necessary. We'll discuss management more some other time.

Why talk about this right now? Because now is the time to start planning the forage balance for the rest of this year and thinking ahead for improvements for next winter. Winter feed costs are generally at least fifty percent of the cost of keeping a cow around. Depending on the price of hay, winter feeding will run from a shy dollar per day per animal unit or $1.20 for a 1,200-pound cow to over $2.00 per day depending on the source of hay and/or other feeds fed. That adds up very fast. Hay and other feed are not free. There are always nutrients to be returned, equipment to maintain, and if a wheel is turning, we are spending money. A dollar saved, is a dollar earned. That's a Benjamin Franklin adage with some inflation added on.

Lastly, the question about when we can start grazing has already been asked. There is regrowth in some areas mainly due to some slightly warmer weather periods this winter. The cows are always ready to consume those tender morsels, but it is still best to wait until there is ample growth available prior to any grazing. Grazing too quickly in the spring actually reduces the total production for the season. Most cool season grasses should be at least eight inches tall prior to the first grazing and even then, shouldn't have much removed with the first grazing because the plant is rebuilding that needed solar panel and new roots. Remember, it takes grass to grow grass.
Keep on grazing!

Victor Shelton, NRCS State Agronomist/Grazing Specialist

More pasture Information and past issues of Grazing Bites are available at:
https://www.nrcs.usde.gov/wps/portal/nrcs/in/technical/landuse/pasture

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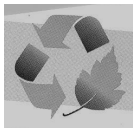

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Rental Equipment Available at Dubois County SWCD

- **No-Till Drill**

Great Plains No-Till drill has a seeding width of 7 feet, and can be used to plant soybeans, wheat, legumes, grasses, etc. It can also be used to plant native, or warm season, grasses. *Rental fee is $8/acre* or minimum of $50.

- **Stapler/Staples**

Installing erosion control blankets? This stapler makes completing the job easy! The plunger simply pushes the staples into the ground. *Rental fee is $10/use and box of 1,000 staples is $50 per box.*

- **Spinning Jenny**

Use to install high-tensile wire fences. Load with wire and set on the ground. Walk away pulling the end of the wire and it will spin, preventing your wire from tangling. Slow down gradually before stopping to prevent over-spinning and tangling. Can also be used to rewind wire in the field. *No Rental Fees.*

- **Tile Flags**

Flags on 36" wire staff can be used to mark underground power lines or surveying jobs. *Cost is $7.00/bundle of 100.*