CFAES

OHIO STATE UNIVERSITY EXTENSION

NORTHEAST OHIO AGRI-CULTURE NEWSLETTER

Your Weekly Agriculture Update for Ashtabula and Trumbull Counties

May 16, 2023

In This Issue:

Hello Northeast Ohio Counties!

A lot of progress has been made on tillage, nutrient applications, and planting. By this time next week, we anticipate most of the corn and soybean planting will be completed. The weather for the past week is in stark contrast to the first week of May.

After a needed shot of rain this weekend it looks like we will have another dry run heading into Memorial Day.

Stay safe and have a great week!

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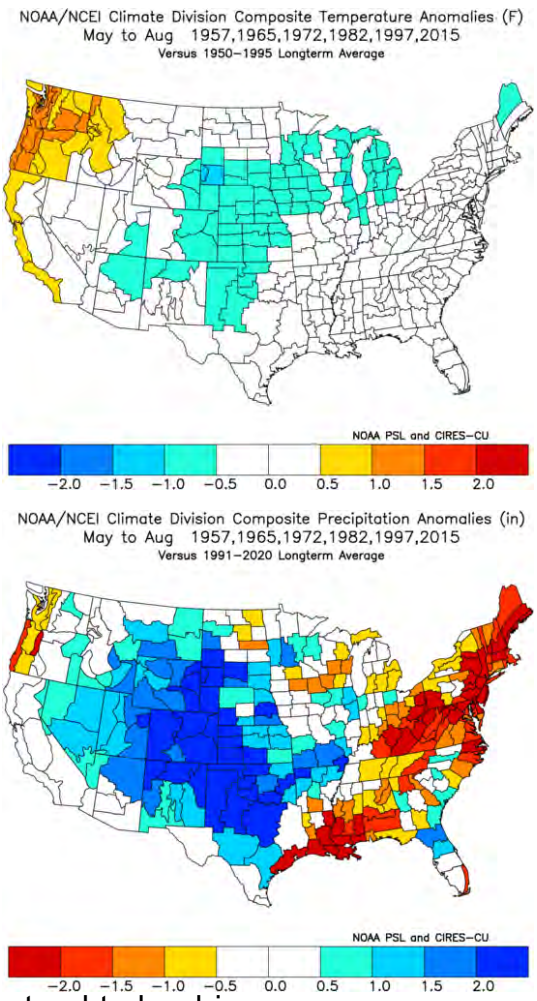
Changes Ahead with Potential El Niño

By Jim Noel
Source: https://agcrops.osu.edu/newsletter/corn-newsletter/2023-14/changes-ahead-potential-el-niño

After a dry late summer and autumn of 2022, winter turned wetter to offset that dry period. However, in April 2023, we turned a bit drier again. The main thing we need to monitor closely now is a rapidly developing event in the eastern equatorial Pacific Ocean. It appears we are on our way toward an El Niño very soon. There are two types of El Niño events, ones in the eastern equatorial Pacific near South America (almost directly south of Ohio) and the other in the central equatorial Pacific Ocean more south of Hawaii. It appears this one may be an eastern Pacific type. Historic years with the eastern Pacific developing El Niño (EPAC) include 1957, 1965, 1972, 1982, 1997 and 2015.



The following images are what happens from May to August in those developing eastern Pacific El Niño years since 1950 for temperatures and precipitation. In those summer growing seasons, it tends to be normal temperatures (with limited extreme maximum temperatures above 95) with a tendency toward drier than normal conditions. The wheat areas of the Plains and western corn and soybean areas tend to see wetter conditions while eastern corn and soybean areas tend to be drier.

The Midwest Regional Climate Center at Purdue has a great page with crop yields impact related to these developing El Niño events. Most of the EPAC El Niño years had below normal trend line yields in Ohio. It is not a guarantee this would happen this year yet as things are developing at this time. We should know more in a month or so.

https://mrcc.purdue.edu/mw_climate/elNino/impacts.jsp

OUTLOOKS:
The outlook for the rest of May includes near normal temperatures with precipitation near normal in southern Ohio and below normal in northern Ohio. The latest U.S. climate model indicates a drier June and August and a near normal July for rainfall.

https://www.cpc.ncep.noaa.gov/products/CFSv2/htmls/usPrece3Mon.html

Looking ahead to autumn harvest season, the normal temperature pattern and normal to below normal rainfall trends are expected to linger through October before wetter conditions may arrive late in the harvest season about November.

The other indication is freeze and frost conditions do not look likely in September but could occur at or earlier than normal in October based on projected El Niño conditions.

https://www.cpc.ncep.noaa.gov/products/CFSv2/htmls/usT2me3Mon.html

In summary, it appears an El Niño is coming very soon and could have some negative impacts to Ohio. Monitor for areas of developing dry conditions into June.

Big tractors, now heavier than many dinosaurs, can damage deep soil

By Erik Stokstad
Source: https://www.science.org/content/article/big-tractors-now-heavier-many-dinosaurs-can-damage-deep-soil

A top-of-the-line farm tractor stands taller than an African elephant. And fully loaded with grain, a combine harvester weighs up to 36 tons—as much as a small herd of pachyderms. As these mechanical beasts lumber across fields, their extreme heft can slowly crush the soil and make it harder for plant roots to grow. Such effects, a new study suggests, could diminish harvests across 20% of global cropland in the coming decades.

“Heavy machinery is something we should not ignore,” says Rattan Lal, a soil scientist at Ohio State University, Columbus. “It can really cause damage.”

Tractors have been getting ever bigger since the 1960s, and the largest now weigh almost 10 times what they did then. That's heavier than some sauropod dinosaurs, the largest creatures ever to walk on land. Although the machines' size makes them more efficient, all that extra weight comes at a cost.

To find out how agricultural vehicles have changed—and how they might affect the soil—Thomas Keller of the Swedish University of Agricultural Sciences and Dani Or of the Desert Research Institute assembled published industry data going back to 1958. Then, they modeled the forces exerted by the tires on the soil at various depths.

In mechanized farming, compaction has long occurred in the upper soil, in layers shallower than 50 centimeters. On many farms, this topsoil is plowed or tilled each season to prepare the ground for planting, making such pressures largely a nonissue. The problem now is deeper, researchers say, because compaction in the layers below 50 centimeters often exceeds safe limits.

This squeezing can collapse the tiny spaces between soil particles, letting less water and air reach the deep soil. All told, these changes could decrease crop yields by 10% to 20%. And the effects would likely be long-lived: It could take decades for earthworms and other organisms to loosen the deep soil.

It's not just combine harvesters. Other farm equipment, used for ploughing and spreading fertilizer, is also getting heavier, as are vehicles used for logging. Roughly 20% of agricultural land around the world is at high risk of lower yields from deep soil compaction, the authors report today in the *Proceedings of the National Academy of Sciences*. These areas, like the savanna of Brazil and southeastern Australia, have vulnerable soil and heavy equipment—and they are the bread baskets of the world.

Thomas Way, an agricultural engineer with the U.S. Department of Agriculture, says there are ways to minimize soil compaction. One is to not drive on fields when they are wet, which makes soil more vulnerable. And during dry weather, GPS can help farmers drive the same routes each time to lessen the total area that is under pressure.

The new study also raises what the paper authors call a "prehistoric paradox." If modern farm equipment depresses plant productivity to such a degree, what happened when sauropod dinosaurs roamed Earth? Perhaps they stuck to well-worn paths, the researchers speculate, or maybe they waded in water along shorelines. Whatever the answer, it's clear that modern farm machines should be designed with an eye toward soil strength; otherwise they risk going the way of the dinosaurs.

When do you leave seed in the bag?

By Hay and Forage Grower
Source: https://hayandforage.com/article-4392-When-do-you-leave-seed-in-the-bag.html

Every state has their recommended seeding date range for establishing cool-season forage species in the spring. There are even “drop-dead” dates established by USDA’s Risk Management Agency whereby they will no longer insure new seedings. These dates have all been established for good reasons, mostly to maximize the odds of a successful establishment outcome.

But what if it gets late and you’re already beyond the recommended range for cool-season forages?

When I worked as an extension agent, this predicament would come up often, and I would be hung with giving a farmer my blessing to seed anyway or keep their seed in the bag.

Over the years, I became more prone to offer my blessing than tell a person they shouldn’t plant. The only exception was if conditions were dry and future rainfall was nowhere in sight. In late-May or June, this was an extremely rare situation in humid Wisconsin.

We like to seed cool-season forage species early because they germinate at relatively cool soil temperatures, they can get ahead of the weed flush that comes later, moisture is usually a nonissue, and total-season forage yields are enhanced. There is also a lower risk for hard thunderstorms that can wash seedings away or cause severe soil crusting and erosion.

Some risks are greater

For late plantings, we can flip all those advantages into risk factors. The primary one is the better odds for hot, dry soil conditions. What we don’t want to happen is to get a little rain, germinate the seed, and then have our seedbed turn to dust. That is a forage seeding’s apocalypse.

Weeds can definitely be an issue with later plantings; however, there are viable herbicide options, especially for pure alfalfa seedings. Glyphosate resistant varieties makes weed control for alfalfa relatively easy with little risk of crop injury. Of course, there are other good herbicide options as well.

If seeding alfalfa and grasses together, weed control must be taken into consideration before leaping into a late planting. It could be a deal breaker if weed competition is expected to be a problem. Seeding-year forage yield, for any type of planting, will generally be reduced for delayed plantings compared to earlier seedings.

If weeds aren't a particular concern or can be dealt with, soil moisture is really the only limiting factor for a successful late seeding. One thing to keep in mind is that soils are warmer and seedling emergence is much faster with a late seeding date. Cold-soil seedling diseases may also be less of a problem.

A planned late-seeding approach
Tom Kilcer, a private crop consultant based in Tennessee, recently wrote about a system that he's encouraged farmers to try. Kilcer says that he and other farmers have had success making no-till legume seedings following the forage harvest of a winter-annual crop such as rye or triticale. "Our surprise when we first tried this is that we got better and thicker stands than when we planted in early spring," the crop consultant notes.

"With a 3-inch (winter annual) stubble, the wind is kept off the soil surface so the soil is moist right to the top," Kilcer explains. "When it rains, the stubble captures the moisture and channels it into the soil surface."

Kilcer suggests spraying the winter forage stubble with a low rate of glyphosate and 15 gallons of water per acre to ensure coverage of small emerging weeds. Then, give it an hour to dry and plant with a no-till drill or a conventional drill with press wheels.
Planned or not, there are bigger risks we can take in a forage production enterprise than seeding into early summer. Although it may not be wise in every situation, don't get too alarmed if the normal "drop-dead" seeding date passes by.

Pasture repairs after a muddy winter

By Dean Kreager
Source: https://u.osu.edu/beef/2023/05/10/pasture-repairs-after-a-muddy-winter/

At this late date, annual forages may be the best option to get something green.
By now hay feeding is complete and animals are enjoying the green grass instead of trying to find a way to get to the other side of the fence. How much damage was done in the areas hay was being fed this winter?

Pugging is the damage to sod created by animals' hooves. Studies have shown that pugging damage can reduce forage productivity by up to 80% or more in severely damaged areas. For those who like to be scientific, there is a published system of scoring the damage based on Australian research and described by the University of Kentucky. A chart is available online. With that system, you can look at the percent of damage within one square foot along with the depth of the damage from zero to over 4 inches. These measurements should be repeated in several locations to find an average. Together these numbers are used to characterize the damage as very light, light, moderate, severe, or very severe.

The repair plan would range from letting nature take care of the damage on its own, for the lightly damaged areas, up to a complete renovation on the very severely damaged areas. Complete renovation would only be needed in areas where almost all the sod was destroyed unless your goal is to establish an improved seed mix to the pasture. Areas considered moderate to severe in damage may need some combination of harrowing, seeding and cultipacking to level the soil and get new plants started ahead of early summer weed pressure. The goal would be to do this without destroying existing sod.

Seeding can be done with a no till drill, conventional drill, or broadcast. If using a drill, making passes in two directions will encourage a thicker stand. Be mindful of seeding depth and keep it a quarter inch or less. Pulling a cultipacker across areas that were broadcast seeded or planted with a conventional drill that was not able to get seed into the soil will encourage seed to soil contact and will help germination and establishment. The Ohio Agronomy Guide is a great resource for determining seeding rates and is especially helpful with rates when mixing multiple species. Contact your local Extension Office for assistance.

One thing we do know is that mother nature will allow something to grow even in the most damaged areas. This could be common ragweed, cocklebur, and goose grass but something will grow. Areas with little sod remaining provide a great opportunity for weed seed, that may have been dormant in the soil for years, to germinate. Allowing heavily damaged areas to take care of themselves may produce more weed issues in the future.

To get the plants you desire to grow you need the right soil conditions and the right seed to be present. In feeding areas, you would think the soil fertility would be good but

that is not always the case. Additionally, nutrients from animal manure are not going to fix soil pH problems. Taking a soil test should be the first step before renovation.

We are moving toward the end of the window for spring seeding so there is a sense of urgency. Remember that perennial grasses will need at least 60 days to form a good root system. That would mean planting that occurs at the beginning of June would need to count on a cool damp July for the plants to develop. Ideally any seeding should be completed by early May and even sooner in southern Ohio. If you can't complete the project now, waiting until August may be a good idea. Conditions for starting cool season grasses are normally much better as we head into fall. If the pH on your soil test is below 6.0, this would also allow for a lime application to be completed and have time to work over the summer.

If the renovation needs to be delayed, there is still another option. To get the ground covered, reduce weed pressure, and provide additional forage, an annual such as wheat, rye, or annual ryegrass could be planted now to reduce weed pressure and provide some grazing opportunities while you wait for an early fall renovation.

Managing Soil Acidity, Not Soil Balancing, Affects Yield

By Megan Sever
Source: https://acsess.onlinelibrary.wiley.com/doi/full/10.1002/crso.20279

It can be hard to convince people of something when they think their lived experience suggests otherwise. That's the challenge facing scientists trying to convince organic farmers that soil balancing—specifically through the base cation saturation ratio method, or BCSR—doesn't actually improve crop yield. No scientific evidence exists for there being an ideal calcium–magnesium ratio, yet "people believe that calcium–magnesium ratios are essential for managing and balancing soils," says Steve Culman, Associate Professor and Endowed Chair of Soil Science at Washington State University in Pullman. Culman and his colleagues' latest paper (https://doi.org/10.1002/cft2.20210) in *Crop, Forage & Turfgrass Management*examines this issue again: Does calcium–magnesium soil balancing increase yield? And the answer, Culman says, is unequivocally no. What does increase yield, however, is pH, according to the research.

The idea of soil balance affecting crop yield dates back to the 1800s though work in the 1940s solidified the theory. Since then, many farmers have worked to create an "ideal soil," which should consist of something like 60–75% calcium, 10–20% magnesium, 3–5% potassium, and 15% other cations like hydrogen, so the theory goes. The theory suggests that high magnesium levels in soils lead to "tight" soils with limited aeration and that higher calcium levels lead to looser soils.

“Some agronomists, consultants, commercial soil-testing labs, and farmers strongly subscribe to this practice and continue to use it to guide their soil management decisions and nutrient recommendations,” wrote Culman and Vijayasatya Chaganti in a review on this topic in 2017 (https://doi.org/10.2134/cftm2016.10.0072). In fact, many conventional farmers, sports turf growers, and most organic farmers in the Midwest still follow this practice. Organic growers use soil balancing as one part of their holistic approach to soil health, says Andrea Leiva Soto, a post-doctoral researcher at Texas A&M AgriLife Research in Amarillo and lead author of the new paper in *Crop, Forage & Turfgrass Management*.

The usage of BCSR in all of these industries occurs despite the fact that “the common outcome of every study that has been conducted for crop yield response to varying cation ratios [has refuted] the existence of an ideal ratio or a balanced soil,” Chaganti and Culman wrote.

So why keep doing it? Balancing soil isn’t free. Farmers have to apply amendments to increase calcium, which costs money, energy, and time. The only way to get that money back is with higher yields.

So Culman, Leiva Soto, who performed the work as part of her doctoral thesis at Ohio State University in Wooster, and their colleagues undertook a six-year-long study of small organic plots in Ohio to see if they could find any signal that yields were indeed increasing through soil balancing. The soil was a moderately well-drained silt loam with an initial pH of 5.9. The team planted corn, soybean, and small cereal grains in rotation with each crop growing every year of the study. They chose these crops because they’re the most common crops in Ohio, Culman says.

From 2015–2020, the team applied gypsum and high-calcium lime to increase calcium levels. They also applied two different types of lime—high-calcium lime or dolomitic lime—to increase the soil pH over that time. This allowed the team to test both whether BCSR increased yield as well as whether increasing pH improved yield. It also allowed them to test whether high-calcium lime, the preferred—and more expensive—form of lime used by organic growers, produced higher yields than dolomitic lime. Throughout the experiment, the team collected soil cores to measure how soil properties changed after the amendments were applied. And they analyzed crop yield data each year as well as year over year.

Results showed that amendments altered soil cation exchange capacity, cation base saturation, and pH, and calcium levels increased in the plots that received high-calcium lime or gypsum amendments. Over the six-year period, soils amended with gypsum or gypsum and high-calcium lime were “within BCSR ideal ranges for both calcium and magnesium saturation,” Leiva Soto and colleagues reported. The soils that did not

receive gypsum or gypsum plus high-calcium lime “would be considered highly out of balance,” they wrote.

Over the life of the experiment, only corn yields varied significantly, and they only varied in fields that had lime applied to raise the pH. For the first two years when pH hadn’t yet increased significantly, corn yields were relatively even. But as pH rose in the third year on the lime-amended fields, corn yield doubled and stayed that much higher for the remainder of the experiment. The average pH across the fields with lime applications was at 7.0 (somewhere between 6.0 and 7.0 optimizes crop production, Leiva Soto notes). Soybean yield increased slightly starting in Year 3 and stayed about the same, but soybean generally isn’t as responsive to pH as corn. The team didn’t analyze the small-grain yields due to the small sample size.

Acidity affects crops. In the foreground, corn is growing slowly in acidic soils with a pH of 4.4. The tall corn in the background is grown in soils treated with lime to raise the pH. New research backs up the idea that pH affects crop productivity more than soil balancing. Photo courtesy of Wikimedia Commons/Alan Manson and published here under this license: https://creativecommons.org/licenses/by/4.0/deed.en.

“We tried our damnedest but just cannot find evidence” of calcium–magnesium ratios affecting yield, Culman says. “There’s just no signal.”

But there is a strong signal that managing soil acidity does affect crop yields, especially for corn, Leiva Soto says. Higher “pH drove higher yields for corn than the calcium-to-magnesium ratio.” In addition, she says, there was no yield difference between high-calcium lime and dolomitic lime—the results were the same. Given that dolomitic lime is less expensive, she adds, it would make more sense for farmers to switch to that lime source.

It would also make sense for farmers to stop applying tons of calcium on their fields in any form, Culman says. Plants need calcium, of course, but most soils have enough for crops like corn, soybean, and grains. It doesn’t hurt to add a little, but why spend the money to add tons to change the structure of the soil if that doesn’t make a difference in yield? Applying calcium to balance soils results in unnecessary fertilization rates. “It all comes back to economics.”

Proponents of BCSR, however, say soil balancing also helps with other issues, like pest and weed control. Previous research has not confirmed that soil balancing plays any

role in pest or weed control, but it has not denied it either. The idea, Leiva Soto says, is that by changing the soil structure through calcium amendments, you decrease weed pressure. Farmers say they see fewer weeds in soils with high calcium levels due to the soils being looser. They say they see more weeds, especially grass weeds, in tighter soils with higher magnesium and lower calcium levels. “We found some signs of what the farmers were saying,” she says. That research is being prepped for publication, so stay tuned, she adds.

Aside from that potentially positive note about calcium amendments and weed suppression, Leiva Soto says, the main takeaway from this research is that for corn growers in the Midwest, the story is pH, not calcium–magnesium ratios, if you want to increase yield.

Even though previous studies have found the same results that this team did (that calcium–magnesium balancing doesn’t increase yields), Culman says the research is still important. It doesn’t help to just tell farmers not to do something when they think it’s working for them, he says. Doing the research and putting out the scientific evidence, he says, is the best way to provide growers with the best possible information.

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PROGRESSIVE AGRICULTURE
SAFETY DAY®

Saturday, June 3, 2023 from 9:30 a.m. – 2:00 p.m.
This years event will be at the:
Ashtabula County Antique Engine Club

This **FREE** event is for children ages 4 and up.
Families are welcome to stay!
Registration will be in person only and begin at 9:00 AM

A packed lunch is required for all participants

Topics Include

Water/Pond Safety
PTO Safety
Equipment Safety
Chemical Safety
Animal Safety
Grain Safety

Sign up for shirt sizes here

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