Hello Northeast Ohio Counties!

An unusually dry March has allowed for some early field work here in NE Ohio. Looking ahead this week there is rain in the forecast, but also temperatures reaching 70 degrees in some locations.

With planting season around the corner, check out today’s first article on spray nozzles to assist you in selecting the right nozzle for your operation.

Stay safe and healthy!
Time is now to purchase the right nozzles for your spraying needs
By: Erdal Ozkan
Source: https://agcrops.osu.edu/newsletter/corn-newsletter/2021-06/time-now-purchase-right-nozzles-your-spraying-needs

This is the time of the year you must complete shopping for nozzles because the spraying season is just around the corner. Each part of the application equipment plays a critical role in achieving maximum performance from the sprayer. Therefore, each component must be selected carefully and must perform successfully the tasks associated with it. Although nozzles are some of the least expensive components of a sprayer, they hold a high value in their ability to influence sprayer performance. They help determine the gallon per acre intended application rate. They also influence the droplet size, which plays a significant role in achieving improved penetration into crop canopy and better coverage on the target pest, both affect the efficacy we expect from pesticides applied. Wrong choice of nozzle may hurt us in several ways, but here are the three most obvious ones: We may end up with streaks of untreated areas causing non-uniform pest control; or simply complete failure or ineffective pest control which require repeat applications; and finally, we may end up losing a significant part of the pesticides applied in the form of spray drift. Sometimes, the choice of nozzle may be determined by the requirements given on the pesticide label.

Selecting the best nozzle requires careful consideration of many important factors including: sprayer operation parameters (such as application rate, spray pressure, travel speed); type of chemical sprayed (herbicides, insecticides, fungicides); mode of action of chemicals (systemic, contact); application type (broadcast, band, directed, air assisted); target crop (field crops, vegetables, vineyard, shrubs and trees, etc.); and spray drift risk. I will briefly cover some of these topics in this article. For detailed information on nozzle selection, I strongly recommend you read a new Ohio State University Extension Publication, entitled “Selecting the Best Nozzle for the Job”. In this publication, you will see step-by-step guidelines for selecting the most appropriate spray nozzle for a given application situation. The publication is available online at following web site: http://ohioline.osu.edu/factsheet/fabe-528
Which nozzle type is best for your situation?
When I get a question like, “what is the best nozzle I can buy?”, my answer is: it depends on the job on hand. The nozzle selection is a two-step process. First, we need to determine the type of nozzle best for a given situation. Next, we need to determine the appropriate size of that nozzle that will be capable of providing the desired gallons per acre application rate under various operating conditions such as travel speed and spray pressure. Each nozzle type is designed for a specific type of target and application. For example, a nozzle designed for broadcast spraying is not good for spraying pesticides over a narrow band. While one nozzle may be best for a given situation, it may be worst choice for another. For example, we at Ohio State University have conducted field experiments to determine which nozzles to choose for two different application situations: soybean diseases such as rust and white mold, and wheat diseases such as head scab and stem rust. We included 6-8 different nozzles in the experiments. We found out that while a twin-fan pattern nozzle was best for controlling wheat head scab, the same nozzle turned out to be the worst choice to protect soybeans against rust and white mold when the soybean canopy is tall and dense. So, before buying the nozzles and putting them on the boom, check the nozzle manufacturers’ catalogs which have charts showing which nozzle type will be best for a specific job. Check the websites of nozzle manufacturers to reach their catalogs.

Nozzle size
Once you determine the type of a nozzle you need to buy, you also must buy the right size of that nozzle which will satisfy the application rate (gallons per acre or gpa) you wish to use as you do your spraying at different travel speeds. Nozzle catalogs are filled with tables and charts showing application rates, given a nozzle’s flow rate (gallons per minute or gpm) delivered at various pressures (psi) and travel speeds (mph). However, the charts are only for a limited number of travel speed and nozzle spacing situations. Most nozzle manufacturers have developed Apps for smart phones that provide you the exact nozzle flow rate required for any given set of application parameters, and identify a specific set of nozzle recommendations for the given application parameters. To find these Apps, simply visit the App Store in your smart phone or tablet and do a search
Keep several types of nozzles on the boom
Remember that one specific type of nozzle will not be best for all applications. For this reason, it is best to have several types and sizes of nozzles on the boom so that you can switch to the “best” nozzle choice for a given spraying job. As shown in the pictures below, there are various types of sprayer components and setups you can buy to configure your boom so the new set up allows you to easily switch from one nozzle to another instantly.

Keep spray drift in mind when selecting nozzles
Spray drift (movement of pesticides by wind from the application site to an off-target site) is a serious problem for many reasons. Extensive information related to factors influencing creation of spray drift, is provided in the Ohio State University Extension publication FABE-525 (http://ohioline.osu.edu/factsheet/fabe-525). After wind speed and other weather-related conditions, choice of nozzles is the second most influential factor affecting drift. Research conducted at The Ohio State University and elsewhere clearly indicate that nozzles labeled as “low-drift” significantly reduce spray drift. If drift is, or becomes a concern, it may be best to switch from a conventional nozzle to a “low-drift” version of the same type nozzle with the same flow rate. This is another good reason to have more than one type of a nozzle on the boom.

Give special attention to choice of nozzles when applying pesticides containing 2,4-D and Dicamba
The labels of 2,4-D or Dicamba herbicides include specific requirements on which nozzle or nozzles must be used when spraying these products. The requirements also include a range of operating pressures for each one of these nozzles. These strict requirements are put on the labels to avoid off-target movement (drift) of spray droplets. Simple interpretation of these requirements is: you would be violating the pesticide label, therefore the law, if you use any other type and size of nozzle and operate these nozzles outside the pressure ranges. Remember, the label is the law! So, it is your
responsibility to comply with the requirements on pesticide labels. You can reach a list of currently approved nozzles and their operating pressure ranges on labels of the several commonly used 2,4-D and Dicamba products at this web site: [https://peedsted.osu.edu/sites/peedsted/files/imce/ApprovedNozzles.pdf](https://peedsted.osu.edu/sites/peedsted/files/imce/ApprovedNozzles.pdf)
The table at this site is provided mostly for information purposes and may not be up to date. So, check the manufacturers’ websites, and read the product label for the most current information. Do not assume that you do not have to worry about checking the label because you had applied the same product in a previous year. A nozzle required for the same product last year may not be on the label this year, or the operating pressures might have been changed.

**Some final thoughts**
Nozzles are typically the least costly items on a sprayer, but they play a key role in the final outcome from a spraying job: achieving maximum efficacy from the pesticide applied while reducing the off-target (drift) movement of pesticides to minimum. Pesticides work well if the rates on labels are achieved during application. This can be achieved only if the right nozzle type and the proper size of the nozzles are on the sprayer, and the sprayer is operated properly.

**Going back in time restores decades of quiet corn drama**
By: University of Illinois College of Agricultural, Consumer and Environmental Sciences
Source: [https://www.sciencedaily.com/releases/2021/03/210316132052.htm](https://www.sciencedaily.com/releases/2021/03/210316132052.htm)

Corn didn't start out as the powerhouse crop it is today. No, for most of the thousands of years it was undergoing domestication and improvement, corn grew humbly within the limits of what the environment and smallholder farmers could provide.

For its fertilizer needs, early corn made friends with nitrogen-fixing soil microbes by leaking an enticing sugary cocktail from its roots. The genetic recipe for this cocktail was handed down from parent to offspring to ensure just the right microbes came out to play.

But then the Green Revolution changed everything. Breeding tools improved dramatically, leading to faster-growing, higher-yielding hybrids than the world had ever seen. And synthetic fertilizer application became de rigueur.

That's the moment corn left its old microbe friends behind, according to new research from the University of Illinois. And it hasn't gone back.

"Increasing selection for aboveground traits, in a soil setting where we removed all reliance on microbial functions, degraded microbial sustainability traits. In other words,
over the course of half a century, corn breeding altered its microbiome in unsustainable ways," says Angela Kent, professor in the Department of Natural Resources and Environmental Sciences at the University of Illinois and co-author of a new study in the International Society of Microbial Ecology Journal.

Kent, along with co-authors Alonso Favela and Martin Bohn, found modern corn varieties recruit fewer "good" microbes -- the ones that fix nitrogen in the soil and make it available for crops to take up -- than earlier varieties. Instead, throughout the last several decades of crop improvement, corn has been increasingly recruiting "bad" microbes. These are the ones that help synthetic nitrogen fertilizers and other sources of nitrogen escape the soil, either as potent greenhouse gases or in water-soluble forms that eventually end up in the Gulf of Mexico and contribute to oxygen-starved "dead zones."

"When I was first analyzing our results, I got a little disheartened," says Favela, a doctoral student in the Program in Ecology, Evolution, and Conservation Biology at Illinois and first author on the study. "I was kind of sad we had such a huge effect on this plant and the whole ecosystem, and we had no idea we were even doing it. We disrupted the very root of the plant."

To figure out how the corn microbiome has changed, Favela recreated the history of corn breeding from 1949 to 1986 by planting a chronological sequence of 20 off-patent maize lines in a greenhouse.

"We have access to expired patent-protected lines that were created during different time periods and environmental conditions. We used that understanding to travel back in time and look at how the associated microbiome was changing chronologically," he says.

As a source of microbes, Favela inoculated the pots with soil from a local ag field that hadn't been planted with corn or soybeans for at least two years. Once the plants were 36 days old, he sequenced the microbial DNA he collected from soil adhering to the roots.

"We characterized the microbiome and microbial functional genes related to transformations that occur in the nitrogen cycle: nitrogen fixation, nitrification, and denitrification," he says. "We found more recently developed maize lines recruited fewer microbial groups capable of sustainable nitrogen provisioning and more microbes that contribute to nitrogen losses."

Kent says breeding focused on aboveground traits, especially in a soil context flooded with synthetic nitrogen fertilizers, may have tweaked the sugary cocktail roots exude to attract microbes.
"Through that time period, breeders weren't selecting for maintenance of microbial functions like nitrogen fixation and nitrogen mineralization because we had replaced all those functions with agronomic management. As we started selecting for aboveground features like yield and other traits, we were inadvertently selecting against microbial sustainability and even actively selecting for unsustainable microbiome features such as nitrification and denitrification," she says.

Now that it's clear something has changed, can breeders bring good microbes back in corn hybrids of the future?

Bohn, corn breeder and associate professor in the Department of Crop Sciences at Illinois, thinks it's very possible to "rewild" the corn microbiome. For him, the answer lies in teosinte, a wild grass most people would have to squint pretty hard at to imagine as the parent of modern corn.

Like wild things everywhere, teosinte evolved in the rich context of an entire ecosystem, forming close relationships with other organisms, including soil microbes that made soil nutrients easier for the plant to access. Bohn thinks it should be possible to find teosinte genes responsible for creating the root cocktail that attracts nitrogen-fixing microbes. Then, it's just a matter of introducing those genes into novel corn hybrids.

"I never thought we would go back to teosinte because it's so far removed from what we want in our current agricultural landscape. But it may hold the key not only for encouraging these microbial associations; it also may help corn withstand climate change and other stresses," Bohn says. "We actually need to go back to teosinte and start investigating what we left behind so we can bring back these important functions."

Bringing back the ability for corn to recruit its own nitrogen fixation system would allow producers to apply less nitrogen fertilizer, leading to less nitrogen loss from the system overall.

"Farmers don't always know how much nitrogen they will need, so, historically, they've dumped as much as possible onto the fields. If we bring these characteristics back into corn, it might be easier for them to start rethinking the way they manage nitrogen," Bohn says.

Kent adds that a little change could go a long way.
"If we could reduce nitrogen losses by even 10% across the growing region of the Midwest, that would have huge consequences for the environmental conditions in the Gulf of Mexico," she says.

Story Source:
Journal Reference:
1. Alonso Favela, Martin O. Bohn, Angela D. Kent. Maize germplasm chronosequence shows crop breeding history impacts recruitment of the rhizosphere microbiome. *The ISME Journal*, 2021; DOI: 10.1038/s41396-021-00923-z

**Spotted Lanternfly Quarantine Information**
By: Amy Stone
Source: [https://bygl.osu.edu/index.php/node/1756](https://bygl.osu.edu/index.php/node/1756)

A quarantine is established to contain, or reduce the potential spread, of an identified pest. Recently, the Pennsylvania Department of Agriculture (PDA) has expanded their spotted lanternfly (SLF) (*Lycorma delicatula*) quarantine to include 8 new counties. Those counties include: Cambria, Cameron, Franklin, Lackawanna, Montour, Pike, Wayne and Westmoreland. This brings up the total number of PA Counties under quarantine to 34. This is just over 1/2 of Pennsylvania’s 67 counties. Source: Pennsylvania Department of Agriculture, March 2021

Here in Ohio, the Ohio Department of Agriculture (ODA) has written proposed rules for a SLF quarantine in the buckeye state and those
rules are in the open comment period. Once that period expires, ODA will review the comments and move in the direction to implement the SLF quarantine rules. SLF was detected in Ohio last fall in Jefferson County and the quarantine will address that population.

Since we are talking about SLF, it is important to note that we are looking for all Ohioans to be on the lookout for this emerging invasive species. Last fall, adult SLF females laid eggs that will remain in that stage until later this spring when 1st instar nymphs will begin to hatch. As temperatures warm and we find ourselves outdoors, we are encourage everyone to keep their eyes peeled for the egg masses.

If you suspect you have seen SLF egg masses, please report those suspect find through the Great Lakes Early Detection Network (GLEDN) App, or contact the Ohio Department of Agriculture directly via an online reporting form, an email, or telephone call. The following information will be needed: an actual address of the location of the egg mass, name and contact information of the person reporting, and photos.

Source: Virginia Cooperative Extension, Virginia Tech, Virginia State University

Northeast Ohio Agriculture

Ashtabula, Portage and Trumbull Counties
Pesticide and Fertilizer Recertification Update

Happy New Year! I’m sure some of you have received your private pesticide license renewal from the ODA, and are wondering how to get recertified. Admittedly, we are behind this year as we try to navigate changing guidelines from the state, county, and OSU on holding meetings. Hitting a moving target is a little challenging! We will make sure that everyone will get recertified one way or another.

While we prefer in-person programs, that is not possible in the near future. We have been granted permission by the ODA to hold virtual live meetings for pesticide recertification, and we have four sessions scheduled for the upcoming months. You can find those dates below, and registration links as well. These are live events and not recorded. We realize that not everyone has a computer, or reliable internet so we are working on some in-person events later this spring. We will provide updates on those in-person events when those are available.

Thankfully, the deadline for applicators with an expiration in 2020 and 2021 has been extended to July 1, 2021. We hope with the option of having recertification in warmer weather, we can move outside and get together in person. If you have any questions please give us a call and we will answer any questions you have.

- Normal/Agronomy
  - Date: April 7, 2021, Time: Daytime 10AM – 2PM
  - All categories, CORE and Fertilizer

You can register now at https://go.osu.edu/NEOPAT21

Lee’s Monthly News Column

Hello Trumbull County! As I’m writing this, I can’t believe it is March. There has been very little rain, and I can kick up dust in our garden. Couple that with the sunshine and warmer weather and I am getting ready for gardening season. It’s definitely not a normal wet or damp spring, although it looks like we may be getting some rain by the time you read this.

Late winter and early spring is the time of year that adorable baby chicks and ducks are arriving at local farm stores. Although they may be cute and fuzzy, and your kids may beg you to take a dozen home, there are several things you need to consider before you dive into owning poultry. I’ve had numerous call this year with questions regarding zoning laws. The first thing you need to do is contact your local zoning office to find out...
if you can even legally own poultry or livestock where you live. There are several municipalities in Trumbull County that prohibit livestock within their town or city limits. Ohio is an agriculturally friendly state, but local municipalities do have the right to restrict livestock. If you happen to live in a township, there may be a minimum lot size before livestock are permitted, which is commonly five or more acres.

Once you have cleared the legal zoning hurdles, you need to ask yourself if you are willing to commit to raising chickens for the next several years. Those cute little fluff balls will grow very quickly into adult chickens that commonly live over six years of age in backyard flocks. Also, you typically cannot buy a single baby chick from most sellers, so you would be committing to live half a dozen chickens or so for several years.

Owning chickens can be rewarding, and a good learning experience for kids, but they are not for everyone. Chickens love to scratch for food, and while you may love watching them in your yard, your neighbors may not have the same enthusiasm if they dig up flower beds. Chickens will definitely roam the neighborhood if they are not in a fenced area. They can be noisy, especially if you have roosters, so give some consideration where you place their dedicated housing. And, yes, they need dedicated housing. Letting chickens live in your home is unsanitary and can lead to severe health problems for you.

You should also have a plan to remove chicken waste, which includes poop, feathers, bedding, and so on, as letting it build up can be, let's say, aromatic. You can incorporate the waste into your garden or compost pile as it makes an excellent fertilizer.

Providing free access to food and water is a year round requirement, so that will mean providing a frost free water source, or rotating waterers in freezing weather. You will be surprised at how much a small flock of chickens will eat. One of the perks of chickens is that you have access to fresh eggs, but factoring in the costs of feed, supplies, bedding, and other items, owning chickens is much more expensive than purchasing eggs. Depending on the breed, it may be 4-6 months until they lay their first egg. After their first egg, which will be rather small, expect a slow trickle of eggs to increase to an egg a day or every other day per chicken during spring, summer, and early fall. Once the days get shorter and colder you can expect egg production to decline or stop completely. If you are looking to have eggs in the winter, you can add a light to the chicken house and they may lay throughout the winter. Be sure to keep the light and wiring out of pecking distance to avoid any fried chickens or fires.

Owning backyard chickens is a great hobby that can be enjoyable and rewarding, but it is not an effortless. Make sure you are willing to take on the commitment before you decide to purchase those cute little chicks. If you have any questions about raising chickens, what breeds to choose, or want more practical advice about poultry, give me call at 330-638-6783 or email me at beers.66@osu.edu.
Take care, and stay healthy!

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CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information: http://go.osu.edu/cfaesdiversity.
Fertilizer Applicator Certification Training

April 14, 2021  6 – 9 P.M.

Do you apply fertilizer to 50 acres or more for crops that are primarily for sale? If so, you are required by Ohio law to attend a training session or take a test to become certified. OSU Extension Trumbull County is offering a training session (no test) that will meet all certification requirements. Pre-Registration is required a week in advance. Due to COVID-19 restrictions only 10 registrants will be allowed. Cost for this training session is $35/person and includes training materials, and handouts. To register, complete the back portion of this flyer and mail with check to the address below. Please make checks payable to OSU Extension or go to https://go.osu.edu/aprfact2021 to register online and pay with a credit card which is the preferred method.

Location: OSU Extension Trumbull County, 520 West Main St, Cortland, OH 44410

Cost: $35/person

Contact information: 330-638-6783 or beers.66@osu.edu
The Ashtabula County Master Gardeners Present

The Beginning Gardener Series

TUESDAYS, MARCH 16TH - APRIL 13TH, 7:00 P.M.

Learn vegetable and flower gardening basics from the Ashtabula County Master Gardeners! Join us for this 5-part webinar series every Tuesday at 7:00 PM starting March 16th. Each program will be about 30 minutes long, with time to ask questions at the end. If you are wanting to plant a garden for the first time, or looking to improve your basic gardening skills, this series is for you! From types of garden, to plant care, to pest management, you’ll have the knowledge to help you grow fresh produce and flowers in no time!

- Tuesday, March 16th - Types of Gardens and Site Selection
- Tuesday, March 23rd - Soil Preparation and Testing
- Tuesday, March 30th - Plant and Seed Selection
- Tuesday, April 6th - Plant Care Through the Season
- Tuesday, April 13th - Garden Pest Management

Location: Online via zoom  
Cost: Free

Details: Sign up today at: https://go.osu.edu/bgs21

Contact information: For any questions or assistance signing up, please contact Andrew Holden at Holden.155@osu or call 440-576-9008

Ashtabula.osu.edu
SPONSOR: Ohio Farm Bureau Foundation

Camps are open to Ohio students interested in science, food and a variety of ag careers. Students must be a high school freshman, sophomore or junior.

**DATES OF WEEKLONG CAMPS:**
June 13-18 - Ohio State University Main Campus
June 20-25 - Ohio State University ATI Campus

**DATES OF WEEKEND CAMPS:**
Locations will be announced in conjunction with colleges or universities across the state
July 9-11
July 16-18
September 10-12

**COST FOR CAMPS:** Free

**APPLICATION DEADLINES:**
Priority Deadline - March 5th
Final Deadline - April 2nd

**REGISTRATION:** exploreag.org

**APPLICATION REQUIREMENTS:**
- A one-three minute video "Please tell us about one agricultural career and why that interests you."
- One reference that is not a friend or family member

**OVERVIEW OF PROGRAM:**

**Why and who should attend**
With an ever growing population and concerns over food security, there is a need for a workforce of talented young scientists who are able to think critically about the issues associated with providing safe, economical, and aesthetically pleasing food and fiber. This one of a kind STEM camp will engage students in the various careers in science, engineering and technology in the food, fuel, and fiber industry that will be needed to face our world’s challenges. Through hands-on tours and activities in state-of-the-art laboratories, campers will get a unique look at what careers in STEM can entail. Days will be filled with learning from the top agricultural science companies and researchers at Ohio State and Central State Universities. Campers will have the opportunity to network with leaders in the industry while gaining a new perspective on the variety of careers available to them in Ohio related to food, fuel, and fiber production. At the end of each day, counselors will lead the students in leadership development activities and programs to show them how to prepare for college and their future careers.

This action packed week will be highlighted each day with a field trip to a different agricultural/food business (i.e. Smuckers, Mohican State Park, Select Sires) followed by an interactive, on-campus lab activity (i.e. food science, greenhouses, meat lab). Students will be challenged through various activities to discuss current scientific issues facing Ohio and the world. Daily activities will engage them as they critically think through such issues.

THE Ohio State University
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES
TENTATIVE AGENDA/PROGRAMMING

Sunday
3:00 p.m. - Registration and move in
5:00 p.m. - Introductions and camp overview
6 p.m. - Dinner
7 p.m. - Leadership Training
8 p.m. - Evening Activities

Monday:
8:00 a.m. - Team Building/Ag Challenge Time
10:00 a.m. - Food Science Tour
12:00 p.m. - Tour OSU Waterman Farm and Lunch
2:00 p.m. - Freshtown Farm tour
3:30 p.m. - Food Science & Technology Tour
6:00 p.m. - Dinner
6:45 p.m. - Evening Activities

Tuesday:
9:00 a.m. - Turf Grass Presentation at OSU stadium
10:30 a.m. - Veterinary School
12:00 p.m. - Lunch
1:00 p.m. - OSU Agricultural Engineering
3:00 p.m. - Meat Science Lab
6:00 p.m. - Dinner
6:45 p.m. - Evening Recreation

Wednesday
9:00 a.m. - John Deere, Plain City
10:30 a.m. - Select Sires Tour and Lunch
3:00 p.m. - Battelle Darby Creek
6:00 p.m. - Dinner
6:45 p.m. - Evening activities

Thursday
9:00 a.m. - Tour Entomology Lab
10:30 a.m. - Tour Plant Science Facility
12:30 p.m. - Lunch
1:15 p.m. - Tour Soil Science Lab
3:00 p.m. - Return to dorm to prepare for dinner celebration
5:00 p.m. - Celebration Dinner

Friday
8:30 a.m. - Ag Career Pathway Planning
9:30 a.m. - Service Activity
11:30 a.m. - Lunch
12:30 p.m. - Pack up
1:00 p.m. - Depart

**This is sample schedule that is subject to change based on site university**

STUDENT COMMENTS:

“My favorite part of camp was meeting new people and exploring different agricultural jobs.”
-Lauren K

“I liked getting to see every aspect of some ag careers. From hands-on lab to testing to hearing perspective to getting to see equipment. Every part was interesting and gave me a taste of ag careers.”
-Charley P

For additional information, please visit exploreag.com or email mulligan.70@osu.edu