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Corn Seeding Depth: Back to the Basics

Dr. Roger Elmore, Dr. Mahdi Al-Kaisi and Dr. Mark Hanna, Iowa State University

The main objective at planting is to provide the seed an environment suitable for rapid germination and vigorous early growth. This not only requires the right depth for the three interacting factors, texture, moisture and temperature, but also excellent seed-soil contact that provides uniform emergence and vigor for all seedlings. How can we achieve this? If soil moisture at planting – either too much or too little - is not a limiting factor, optimum seeding depth recommendations are fairly simple.



Seeding depth recommendations with 'adequate' soil moisture

Corn needs water, aeration and temperature – all in the right proportions - and contact with soil to germinate and emerge. Standard recommendations for corn seeding depth vary little across the Corn Belt: 1.5 to 2 inches. This is a good compromise for seeding depth because it allows for quick and maximum emergence rates as well as proper root system development. Corn seeds must absorb about 30 percent of their weight in water to begin the germination process. In most soils and most tillage systems, a 1.5 to 2 inch seeding depth is sufficient to reach adequate soil moisture to germinate seeds but not so deep that it reduces soil aeration.

Soil moisture and root development

'Adequate' soil moisture - We put adequate in single quotes because of its subjectivity but what is adequate? A similar statement is, "...plant to moisture!" Adequate soil moisture for germination occurs at field capacity. As mentioned above, seeding depth also directly affects root system development. Understanding this will help us understand the importance of proper seeding depth.

Root system development - Proper root system development depends on correct seeding depth. Figure 1 illustrates how the mesocotyl length compensates for seeding depth. With correct

Cont. pg. 2

seeding depth and soil conditions, the nodal root system forms $\frac{1}{2}$ to $\frac{3}{4}$ inch below the soil surface. The mesocotyl - the first internode - elongates out of the seed to the extent necessary to position the nodal root system at that 'perfect' place near the soil surface. Deeper planting results in a longer mesocotyl; shallow planting results in a shorter mesocotyl. With very shallow seeding, seminal root and nodal root systems occur at the same depth near the soil surface (Figure 1). We discuss the problems of too deep and too shallow planting below. In the meantime, it is important to remember that the seminal root system supports the entire plant during the early vegetative stages; and by V6, the nodal root system completely supports the plant. Both roots systems are essential for corn growth and development. See Corn Growth and Development for more detail on this important process.

Frequently asked questions

1) What if the soil is dry at planting time?

a) Should I place seed into dry soil? The old saying, "Plant in dust, your bins will bust!" is better suited perhaps for winter wheat country than for the central Corn Belt. But, should we adjust corn seeding depths if soils are dry at planting? If soils at 1.5 to 2 inches are drier than field capacity, three possible options exist: plant deeper, adjust planter row cleaners and/or down pressure, or plant at 1.5 to 2-inch depths and hope for rain. The first two options seem most viable - we'll talk about them below. If you are certain of timely rain then the third option may work, albeit inherently with high risk. From our perspective, planting in 'dust' may rank higher in risk than leaving the seed in the bag awaiting better planting conditions.

Although either planting deeper or making planter adjustments are the best alternatives for dry soils, some may consider planting shallow if it's dry. Let's discuss that next.

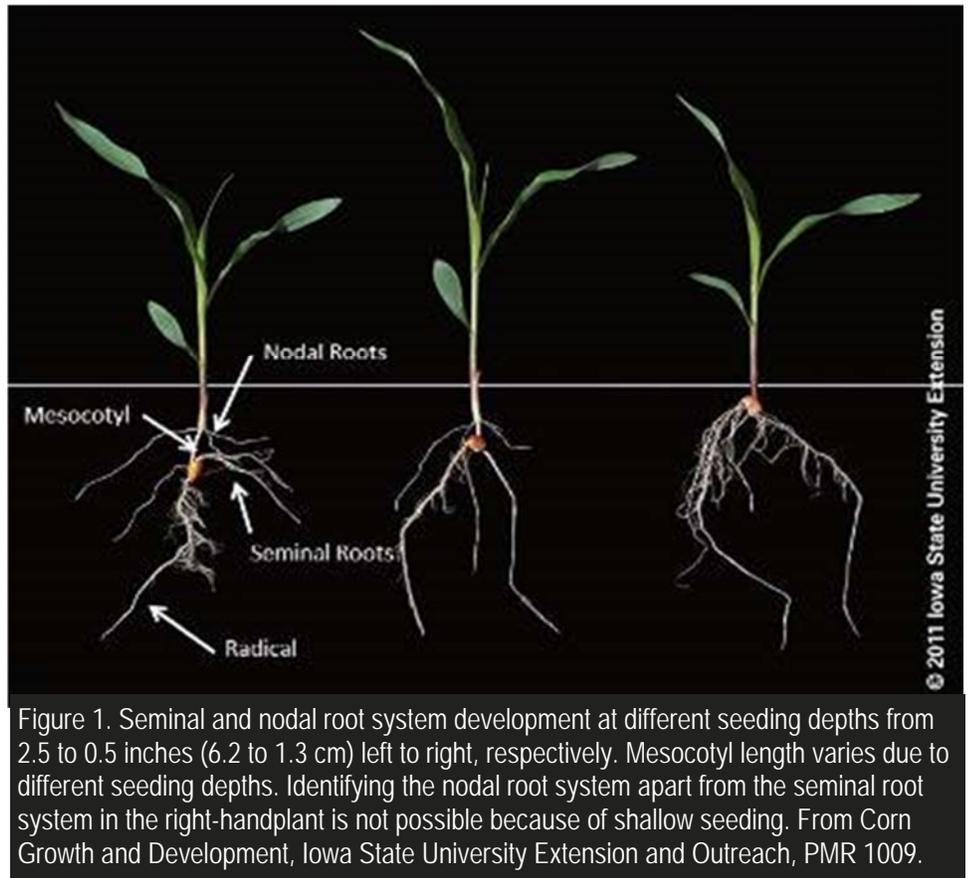


Figure 1. Seminal and nodal root system development at different seeding depths from 2.5 to 0.5 inches (6.2 to 1.3 cm) left to right, respectively. Mesocotyl length varies due to different seeding depths. Identifying the nodal root system apart from the seminal root system in the right-hand plant is not possible because of shallow seeding. From Corn Growth and Development, Iowa State University Extension and Outreach, PMR 1009.

b) Should I plant shallow: less than 1.5 inches? First, if soil and environmental conditions all season - not just from planting until emergence - are excellent, shallow planting should result in plants that emerge faster and yield similar to those planted deeper. However, shallow seeding depths usually result in shallow nodal root placement (see Figure 1) which may compromise stands, uniformity of emergence and yield - if conditions aren't perfect. In addition, 'rootless corn' results from shallow planting, among other things. In some situations, shallow planting results in more bird damage. Thus, planting shallower than 1.5 inches is rarely justified.

c) Should I plant deeper than 2 inches? With drought conditions, it is often impossible to plant deep enough to reach moisture. Fortunately, corn has an astounding ability to emerge from deep planting. For example in the mid-twentieth century, researchers found that

a Navajo corn variety had 11 percent emergence from a 1 foot seeding depth and 61 percent from a 10 inch seeding depth! A modern double cross hybrid at the time, US13, had no emergence at 10 inches or 1 foot, but, at 8 inches it had 56 percent emergence. Leaves of both cultivars opened underground when planted at 1-foot depths. The Navajo corn variety was clearly adapted to deep planting in dry conditions. Modern hybrids emerge from depths greater than most planters can plant.

d) How deep can I plant? Again, that depends on soil moisture, texture and type of tillage system. For example, corn can be planted as deep as 3 to 3 $\frac{1}{2}$ inches on clay soils, 4 to 4 $\frac{1}{2}$ inches on silt soils, and 5 to 6 inches on sandy soils. Soil type affects germination in part because of differences in temperature and water holding capacity and their physical properties. However, if soil moisture is adequate at recommended seeding depths there is no reason to plant deeper.

e) What are the potential problems with deep planting? Unfortunately, an array of problems accompanies unnecessarily deep planting. Slower and more variable emergence is among the biggest potential problems inherent with deep planting. For example, scientists in North Dakota found that an additional day for emergence is required for every 1-inch deeper seeding depth.

Coupled with the slower emergence, deeper seeding exposes seedlings to a greater chance for soil surface crusting and exposure to seedling diseases and insects – since the time between planting and emergence increases. Other issues may also arise; researchers in Virginia working on sandy soils found that deeper planting resulted in wetter grain at harvest – again probably associated with slower emergence.

As we discussed in the root development paragraph above and as shown in Figure 1, the mesocotyl will compensate for deep planting by elongating and positioning the nodal root system within a ½ to ¾ inch of the soil surface in optimum environments. Because of this, deep planting does not result in more nodes formed underground. In fact there is some older evidence that deeper seeding (4 inch vs. 1 inch) resulted in fewer roots above the coleoptile node; thus root numbers from other below – ground nodes were reduced. Deeper rooting does not result in more extensive root systems.

2) What other factors might affect seeding depth?

a) Planting date - Early planting? Most agronomists suggest planting shallow if planting early, but never shallower than 1.5 inches. Soil temperature overrides many factors with early planting. Corn seeds will absorb moisture – if it is available – when soil temperatures are less than 50° F., but they will neither germinate nor begin to grow. With normal seeding depths it takes

90 to 120 Growing Degree Days ° F (GDD) for corn to emerge. Planting too early in cool soils can take up to a month to emerge.

Late planting? The North Dakota researchers mentioned above found that as soil temperatures increase above 50° F., the impact of seeding depth on rate and timing of emergence is also reduced. So, if we experience delayed planting, planting deeper may not be as much of a concern if soil temperatures are greater than 50° F. But since delays are more likely from too much moisture rather than too little, deeper planting to reach moisture likely won't be necessary anyway. Air temperatures around 86° F are optimum for root and shoot growth. Thus, later planting usually results in faster emergence, development, and taller plants because of warmer temperatures.

b) Variability within fields - Variable seeding depth? We've seen fields where one plant out of five within a row was two to three growth stages behind their bigger, competing neighbors. The slower plants were likely planted ½ inch shallower than the others with planter speed or wet soil conditions at planting the likely culprits. No doubt, this size differential would reduce yields – especially in a good year or when combined with other stress factors.

Normally, our goal is uniform seeding depth both within a row and across a field. With new – and perhaps some 'on the drawing or dream board' - technology, we should be able to characterize soil variables important to germination and growth. Technology and the planters with on-the go seeding depth adjustment could possibly improve emergence and early-season growth. In theory, optimum seeding depths should vary within fields that have inherent soil variability. However, no Corn Belt research that has tested this hypothesis is available.

3) Should I use planter row cleaners or adjust down pressure?

Another possibility is adjusting planters differently in tilled fields. One adjustment might entail removing dry surface soil and residue over the seed furrow with row cleaners or some other device. For instance, if soil is dry at the surface and at field capacity at 4 inches, the top 1.5 to 2 inches of dry soil could be moved to the side and seed planted around 2 inches below the surface in a shallow furrow. Soil conditions would need to be good and row cleaners carefully adjusted and monitored for this to work well. This could allow for more rapid and uniform emergence than planting at a 4-inch depth without removing drier soil. However, if row cleaners are used to remove soil over the row and subsequent heavy rainfall occurs, soil can erode on sloping rows or rows can 'puddle' with silt and create a surface crust. This could reduce emergence and handicap early-season growth.

Another adjustment is to set the press wheels with sufficient down pressure to insure better seed-soil contact. This will increase soil capillary action to the seed furrow.

In most years, no-till fields should retain adequate soil moisture at a reasonable planting date, even with drought. If not, follow the guidelines above.

Summary

The bottom line on corn seeding depth is if plants emerge at about the same time and if optimum plant populations are achieved, yields won't be affected. In dry conditions, seeding depth can and should differ depending on the soil texture, tillage system and residue cover. Knowing the texture of the soil and its management requirements, will dictate how deep seeds should be placed to have adequate available moisture for successful germination especially in dry conditions.

Cover crop residue management

Dr. Jarrod Miller, Agent – AGNR, University of Maryland Extension

Cover crops have now served their overwintering purpose and protected your valuable topsoil and scavenged for nutrients. If you planted brassicas (forage turnips, rapeseed, oilseed radish), management should have been easier this year. Brassicas typically don't survive temperatures below 28°F, and this winter provided plenty of freezing weather. However, if winter kill did not occur, or you planted small grains, there are many options to killing cover crops. These include herbicides, tillage, rolling/crimping, or cutting. All of these options should have been done at least two weeks before planting your main crop. Killing your cover crop earlier, especially cereals, helps the

residue dry out and decompose. This will allow for easier planting into the soil. Best laid plans for grain farming can be foiled by uncooperative weather, but late killing may also provide more residue and weed suppression. On the other hand, fresh residue may also decrease seed soil contact and increase alleopathic compounds, which can inhibit the growth of your cash crop. Besides alleopathic compounds, some of the cereal cover crops may also have attracted diseases or pests and scouting your field pre and post planting should be done. No matter what method you used to kill your cover crop, you should be wary of the residue left when planting. Although residue

provides organic matter, nutrients and a mulch for your top soil, it can also clog your planting equipment and reduce seed-soil contact. If you didn't allow enough time for the residue to dry, which may also be due to wet weather, it is more likely to be pushed into the furrow with your seed. How frequently you stop and check will depend on the amount and dryness of the residue in your field. Don't assume an initial check of planting depth or residue contact will suffice, it can vary across the landscape. Just remember that management of cover crops won't end with burn down, and be aware of the negative aspects of organic residues.

Back to Basics for Soybean Planting: Six tips for the beginning of the year to maximize soybean yield at the end of it.

United Soybean Board

As we enter soybean planting time, the most critical management period for soybean production, it's a good time to remember a few of the most critical decisions that can be made, including:

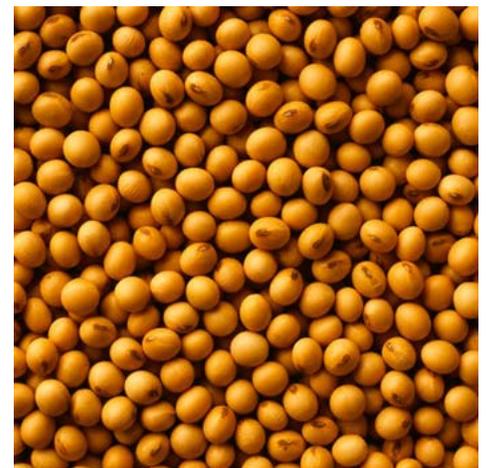
1. Select and plant only the best varieties: Not all soybeans are equal. Each year, seed companies sell soybean seed with a wide range in yield potential. Typically, the best-yielding varieties produce between 20 percent and 40 percent greater yields than those at the bottom. Don't get stuck with a dog. Make your initial selections carefully by using third-party yield information, and only accept substitutions with proven yield potential.

2. Correct low-testing soils now: Carefully evaluate soil test results. Soybeans can typically utilize residual

phosphorous and potassium from a well-fertilized previous corn crop, but if you're unsure about fertility levels, conduct a soil test in the spring. Once planted it's too late to fix deficiencies. Despite renewed attention to this old topic, do not apply nitrogen to soybeans. Nitrogen very rarely increases soybean yields – not to mention extremely rare economic returns.

3. Plant early: In most areas, soybean yields respond to early planting. Plant as early as possible, but only into good soil conditions. Avoid planting with extreme cold and wet weather in the near-term forecast or in extremely dry soils.

4. Plant in narrow rows: Soybeans planted in narrow rows will out-yield those planted in 30-inch rows or wider. You can expect approximately 5 percent of yield



advantage for every 10 inches of narrowing, down to about 10 inches. Fields with a history of white mold may still be planted in narrow rows, but populations should be managed carefully.

5. **Don't trust a post-emergence-only herbicide program:** Including pre-emergence herbicides into an overall weed-management strategy provides a wider window for mid-season applications and allows more options for weed control. Reduce short- and long-term risks by using herbicides with diverse modes of action.

Be safe: The springtime rush often brings long working hours. Please avoid taking additional risks wherever possible.

Agriculture outlook for 2014

Sudeep Mathew, Editor - Agronomy News

Greetings! Agronomy News is turning 5 this year. Thank you for your continued support of this publication. This newsletter has been brought to you by Agriculture & Natural Resources Profitability Impact team at University of Maryland Extension. This year marks another milestone as University of Maryland Extension celebrates the 100-year anniversary of the signing of the Smith-Lever Act of 1914. This act officially created the national Cooperative Extension System in land-grant colleges like the University of Maryland. Over the years, Extension has helped Maryland farmers to improve agricultural profitability, maintain environmental sustainability, promote economic stability, foster marine and aquaculture industries, and expand agricultural technology to its current excellent state.

This year the newsletter will be published monthly instead of bi-monthly during the growing season. If you were a subscriber of this newsletter during last year, I would appreciate if you could complete a brief survey which can be accessed in this link https://umd.az1.qualtrics.com/SE/?SID=SV_bdXNJFDdILz1DbD. For those of you who are receiving the newsletter in paper copy, the survey is included in the last page of the newsletter. This will only take 60 seconds of your time and would be helpful for us.

A major change for Agronomy News this year is that Adam Caskey, Meteorologist,

ABC-7, WJLA-Washington DC will no longer be contributing the Agriculture Weather. Adam has moved to KSAT ABC-12 in San Antonio, Texas. I would like to thank Adam for his excellent agriculture weather reporting for Agronomy News the past couple years. To fill this void, Scott A. Minnick, Meteorologist, NOAA-National Weather Service has agreed to contribute Ag weather for Agronomy News this year. Welcome Scott.

A recent macroeconomic report from European Union is estimating world population to continue growing at an annual rate of around 1%, and reach 7.3 billion inhabitants by 2015. Higher growth is expected in Africa (+2.4% per year and 1.15 billion by 2015), India (+1.2% per year to 1.3 billion), US (+0.8% per year to 322 million) and China (+0.7% in 2014 and 0.6% in 2015 to reach 1.4 billion by 2015). Population is expected to remain virtually unchanged in Russia at 142 million. Population gains in developing countries along with higher incomes, increased urbanization, and expansion of the middle class are particularly important for growth in global food demand. Continued global expansion of biofuels will add to world demand for agricultural products for the long term beyond 2016.

Maryland weather has already contributed to a slow start to the 2014 planting season. The amount of rainfall we got this week will further delay planting. According

to USDA, approximately 20% of corn is planted throughout the country at this time. Corn yields may be affected by late plantings as there is likely not enough time until mid-May to have all planting done without yield penalty. This delay may also cause some growers to convert corn acres to soybean acres. Early estimates suggest soybean acres to increase to 81.5 million *acres nationally*, up 6 percent from last year. According to the USDA *prospective plantings* report, the ratio of November 2014 soybean futures to 2014 December corn futures now favors soybeans more than corn. It seems the market is not yet concerned about the prospective loss of corn acreage this year. Moderate growth in demand is projected over the next decade. Overall prices for wheat, corn, and soybean are estimated to decline this year. If production unfolds as expected, inventories will expand during the 2014-15 marketing year resulting this declining situation. Corn prices are expected to average in the low \$4 range in 2014-15 while average soybean price will be in the \$11 to \$12 range for the 2014-15 marketing year. For wheat, the USDA projected average price will be \$5.30 for 2014/15 marketing-year. Because of this forecasted decline in crop prices it might be worth utilizing your crop inputs efficiently. It is estimated that fertilizer can be as high as 30-40 percent of the input cost for many farms depending on when you purchased the fertilizer. At the same time be careful to not cut back too much so that you do not

influence crop productivity and your net income. On the positive side we can expect a lower feed cost which will be welcomed by the poultry and livestock sectors. Staying on top of the fluctuating market conditions should be your guiding mantra for production decisions this year!

United Nations Food and Agriculture Organization (FAO) has declared 2014 as

the International Year of Family Farming (IYFF). It aims to raise the profile of family and smallholder farming by focusing world attention on farming's significant role in eradicating hunger and poverty, providing food security and nutrition, improving livelihoods, managing natural resources, protecting the environment, and achieving sustainable development in rural areas. As a farmer, you have an integral part of

feeding the world and caring for the earth. Thank You!

As the season progresses, please keep in mind that if you need any help, we at University of Maryland Extension are only a call or click away. Have a great growing season everyone!



Crop Reports

Western

It has been cooler than "normal" however we have plenty of soil moisture. At this time most years more than half our corn would have been planted and alfalfa and cereal grains would be harvested for forage very soon, but not this year. At best, we are three weeks behind where we would expect to be. Wheat, barley and triticale look healthy just shorter than would be expected at this late date. Peaches have bloomed and apples are blooming but it is too soon to tell if there was any damage from the cold nights a few weeks ago. Once the soil gets fit, corn planters and manure tankers will fill the fields and the hurry will begin here in the Hagerstown Valley.

Central

Wheat and barley are greening up well. Pastures are also coming along well with very good growth across the area. Soils were beginning to become fit for planting but cooler weather and heavy rains the last few days of April will cause delays, especially in the heavier soils. Less than 5% of the corn is planted and no beans. Some frost damage to fruit but mostly cherries.

Upper Eastern Shore

Alfalfa is a little behind, but growing fast. Weevils are present in most alfalfa fields. Barley is heading throughout the region on shorter than normal plants. There was very little or no need for a growth regulator this year. Wheat is a little more variable with some fields having good growth and some not. Up to this point, disease pressure on both wheat and barley has been minimal. However, the 3 inches of rain could change that. Corn planting was underway throughout the region, but scattered depending on soil types and topography. The heavier flatter soils were on the wet-side before the 3 inch rain and are saturated now. The lighter soils with a little slope were in good condition before the rain and is where most of the corn planting has occurred. The earliest planted fields are just emerging.

Lower Eastern Shore

Wheat and barley stands are doing great, but some fields are showing damage from recent frosts. Wheat flag leaf emergence is beginning and will be followed by fungicide applications.

Aphids have been observed in wheat, along with some winter grain mites. Most cover crops have been burned down, but progress has been limited by moisture and wind. Fields are prepared for corn planting, but recent rainfall has limited corn planting to drier ground and smaller fields. It remains to be seen what cooler temperatures will do to the corn that is already planted. Approximately 90% of processing potato acres are planted. Planting of peas was in full swing until the rain brought it to a halt. About 40% of the sweet corn and 25% of field corn is planted at this point.

Timeline: This crop report is for the field observations from April 1 through May 1, 2014. Crop Report Regions: Western (Garrett, Allegany and Washington), Central (Carroll, Frederick, Howard, Montgomery), Northeast (Cecil, Harford, Baltimore), Southern (Anne Arundel, Prince George's, Calvert, Charles, St. Mary's), Upper Eastern Shore (Kent, Queen Anne's, Talbot, Caroline), Lower Eastern Shore (Dorchester, Wicomico, Worcester, Somerset)

Agriculture Weather Report

Scott A. Minnick, Meteorologist - National Weather Service



Spring to date has been highlighted by relatively normal temperatures and precipitation across the Mid-Atlantic region and the state of Maryland. However, spring did get off to a cold start in March, pushing back the spring foliage and warming of spring soil temperatures. The cool and wet conditions of late April will transition to a warming trend through early May. The 8-14 day Climate Prediction

Center Outlook has Maryland highlighted by above normal temperatures and slightly above normal precipitation. However, the lack of El Nino or La Nina conditions in the southern Pacific has given the region no strong climate indicator for late spring. The result is rather low predictability outside of a few weeks. The Climate Prediction Center's Monthly Outlook highlights equal chances for above, below, or normal

temperatures and precipitation through the rest of the month. While this may offer little insight into what actually may occur, it does let us know that we are not looking at extreme conditions. There is also a minor risk for flooding across the region, which is typical this time of year with heavy convective rain storms.

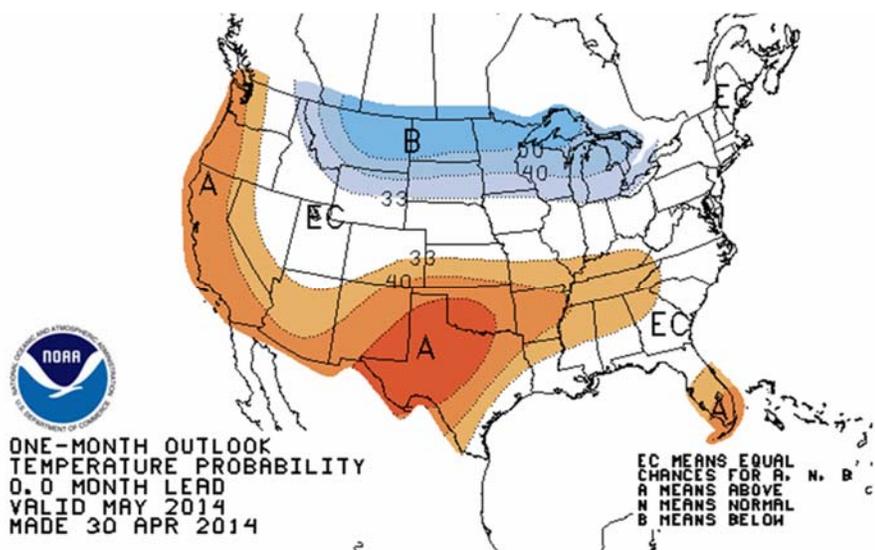


Figure 1 CPC May Temperature Outlook

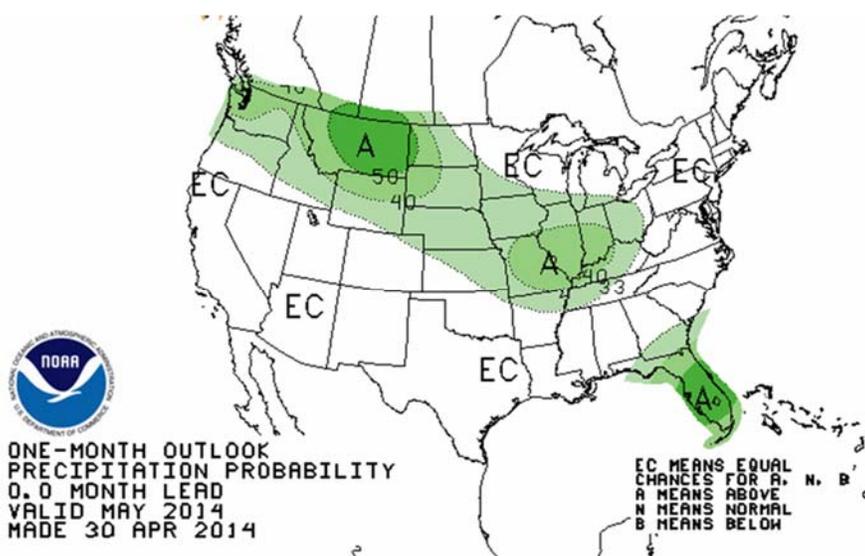


Figure 2 CPC May Precipitation Outlook

Announcements

Can innovative cover cropping systems save you money by using nitrogen deep in the subsoil on your farm?

Dr. Ray Weil, Stanley Fultz, Jim Lewis and Sudeep Mathew

That's the question we are seeking to answer with a new research project. If the answer is yes, then farmers stand to benefit from higher yields and less need to buy fertilizer, not to mention help dealing with regulatory pressure to keep nutrients out of the Bay. The project is being led by Ray Weil, a professor at the University of Maryland and Sjoerd Duiker, an associate professor at Penn State University.

Cover crop systems currently typical in the Maryland Cover Crop Program (generally winter cereals planted in mid-to-late October) don't have enough growing degree days to capture much residual soil N in the subsoil before winter sets in. Soluble nitrogen left deep in the subsoil is all but certain to be lost over the winter leaching season. In spring these cover crops may take up a fair amount of nitrogen that mineralized in the topsoil. However farmers rarely save on N fertilizer because, even after termination, winter cereal cover crops tend to hold on to N rather than release it to the next crop.

We seek to develop practical early-planted cover crop systems capable of capturing deep (2-6 ft deep) N in the fall and releasing it for crop use in the spring. We believe that key elements will be early planting and inclusion of rapidly decaying and/or more long lasting species, possibly in combination. Both early-planted winter cereal and forage radish cover crops are able to effectively absorb N from the subsoil, but the cereals by themselves tend to immobilize N in spring rather than



An early-planted radish cover crop containing about 150 pounds of N per acre in December before winter-killing. Can next spring's crop use some of that N?

release it to the following crop. This project will utilize deep soil N by getting rapid-growing deep-rooted non-immobilizing cover crops established early.

Farmers should profit by utilizing N already on-farm while preventing it from polluting ground and surface waters. We expect that new cover crop practices may pay \$50 + / acre by 1) capturing 100+ lbs N/acre in fall, 2) increasing yield, and 3) releasing N in spring to reduce fertilizer use, while at the same time proactively dealing with regulatory pressures to substantially reduce water quality impacts. Practices that farmers may want to try to enable early seeding of cover crops in their farming system may include such measures as the use of early hybrids for grain or silage, aerial seeding into maturing crops, hi-boy seeders, inter-seeding at layby time, or other innovative techniques.

To make sure our research is in touch with the real world, we are seeking the participation of innovative dairy, grain, and vegetable farmers in Maryland, Pennsylvania and Delaware who would like to try new cover crop systems aimed at increasing short term profits and long term soil health while helping to address environmental concerns.



One method of taking deep soil cores after corn silage harvest to measure unused nitrogen resources 3 or more feet down.

We are seeking farmers interested in collaborating in one or more of the following ways (in order of increasing complexity and active collaboration).

1. Simply agree to have us take soil cores down to 7 or 8 ft. (where possible) in one or more fields to assess the potential supply of deep N. This is part of a general survey of the extent of the deep N resource.
2. Plant simple replicated strips or plots with two treatments—with and without a species of early-planted, deep-rooted, non-immobilizing cover crop (e.g., forage radish or other species of farmer interest).
3. Plant replicated strips or plots with four treatments—no cover crop, a winter cereal, radish, and a three to six species mixture.
4. Help to design and conduct spring N response trials superimposed on late summer cover crop treatments—plant replicated strips or plots with the four treatments described in #3 above, and in the spring, split the plots and apply 0%, 50%, 100%, and 150% of the normal N rate.

Announcements

If you are interested in participating on your farm or have questions please contact one of the following or call 410-228-8800:

Ray Weil: rweil@umd.edu

Sjoerd Duiker: sduiker@psu.edu

Sarah Hirsh: sarah.hirsh@gmail.com

Upcoming Events

2014 Annual Strawberry Twilight Tour

This meeting will be on Wednesday May 21, 2014, 6.00 pm – 8.00 pm at Wye Research and Education Center, 211 Farm Lane, Queenstown MD 21658.



University of Maryland and USDA specialists will discuss:

- Current insect conditions
- Current disease conditions
- Field trial results

Sandwiches and refreshments will be

provided. Registration is not required, but will help us to plan for handouts, food and drinks. Reply to: Debby Dant, 410-827-8056 X115, ddant@umd.edu or Michael Newell, 410-827-7388, mnewell@umd.edu

Fourth Annual Mid-Atlantic Precision Ag Equipment Day

Mid-Atlantic Precision Ag Equipment Day will be held on Wednesday, Aug. 6, 8:30am – 4.30 pm at Wye Research & Education Center, 124 Wye Narrows Drive, Queenstown, MD 21658.

Farmers from around the region are invited to join us and learn how to make

precision agriculture pay in their operation. Practical and informative advice will be given on sprayer and planter section control, variable rate seeding, economics and practical implementation of RTK and GPS, soil mapping, using technology for on-farm research and developing variable rate prescriptions, and much more. This free event is hosted by Maryland, Delaware, Virginia, West Virginia, and Pennsylvania Extension. This event is free and open to the public. Lunch will be provided free of charge. DE and MD Nutrient Management Credits & CCA credits will be available. Stay tuned.

How to Access Agronomy News on the Web

Due to the recent security breach at University of Maryland, College of Agriculture & Natural Resources has made a decision to retire mdcrops website. Contents of the website has been moved to a new location on the web. Agronomy News also moved to the new location along with the old mdcrops website. There are 2 options to access the new web location.

Option 1.

Visit www.psla.umd.edu

Click the Extension dropdown menu

Click mdcrops

Click Agronomy News menu on your left hand side

Option 2.

Visit www.extension.umd.edu

Click the News & Events dropdown menu

Click newsletters

Click Agronomy news



Did You Know

500 million family farms make up over 98% of farming holdings in the world.

SIGN-UP TO RECEIVE “AGRONOMY NEWS”

If you would like to receive this newsletter via email please contact Rhonda Barnhart at rbarnhar@umd.edu. The subject line should be: Subscribe Agronomy News 2014.

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Sudeep Mathew, Editor

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Agronomy News 2014 - Evaluation Survey

Please take some time to complete this brief survey. Complete and return to us with your thoughts and comments. Use additional sheets if needed. If you need any assistance in completing this survey please give us a call at 410-228-8800. Please return the completed survey to: Agronomy News, University of Maryland Extension, 501 Court Lane, Room 208, P.O. Box 299 Cambridge, MD 21613.

What best describes you?

- A. Grain farmer
- B. Vegetable farmer
- C. Fruit farmer
- D. Dairy/Poultry/live stock
- E. Ag Industry
- F. Government
- G. Education
- H. Others

How many acres do you farm?

- A. None
- B. <50
- C. 51-100
- D. 101-200
- E. 201-500
- F. 501-1000
- G. 1001-1500
- H. 1501-2000
- I. 2001-2500
- J. 2501-3500
- K. >3501

Your overall rating of the value of the articles presented in the Agronomy News?

- A. Extremely valuable
- B. Valuable
- C. Neutral
- D. Not valuable

How much do you think Agronomy News helped increase your net income (\$/acre)?

- A. 0
- B. 1-10
- C. 11-20
- D. 21-30
- E. 31-40
- F. 41-50
- G. >51

Rate the increase of your knowledge you gained through Agronomy News?

- A. Very great
- B. Moderate
- C. Very little
- D. None