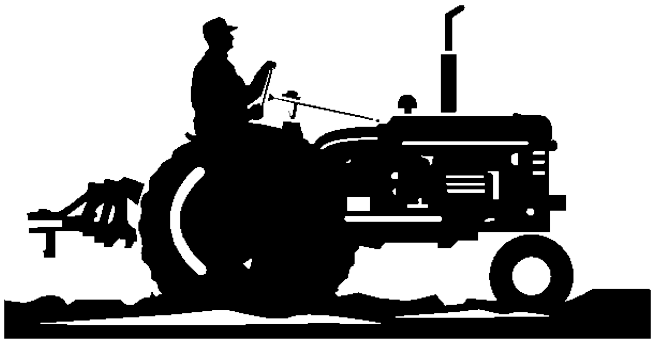
FIELD CROPS NEWSLETTER

May 2016



Melissa E. Huffman
Extension Agent, Agriculture – Field Crops

Contact Us:
NCCE-Onslow County
4024 Richlands Hwy.
Jacksonville, NC 28540

(910) 455-5873
(910) 455-0977 Fax
http://onslow.ces.ncsu.edu

Sulfur Deficiency in Emerging Corn

Now is the time to be on the lookout for sulfur deficiency in your emerging corn. Due to variable rain periods over the past couple of months, sulfur (a water soluble, mobile nutrient) in the upper, 2-4 inches of the soil may have leached into the lower rooting zone. Sulfur deficiencies are usually associated with sandy soils, such as ours in Onslow County.

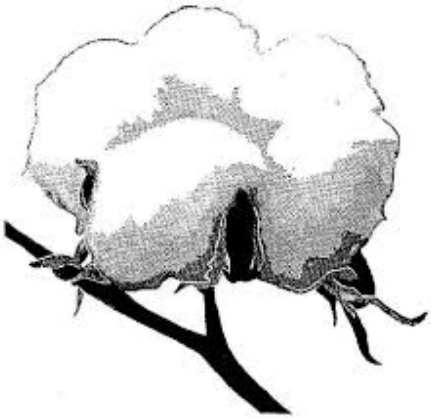
Sulfur deficiency is characterized by a yellowing of the younger or "new" leaves of the corn plant. When the corn plant is small, mild sulfur deficiency symptoms show up as interveinal chlorosis of the leaves emerging from the whorl. As the plant ages and the deficiency becomes more pronounced, the entire leaf turns yellow with slightly greener veins. Typically, sulfur deficiency symptoms are not uniform across the field. Many times it is common to find plant symptoms in the lower spots in the field.

If the deficiency is mild and is corrected before growing point differentiation (21 to 30 days after emergence) by either the root growing into higher sulfur concentrations below the top soil profile or through additional sulfur application, then there will be little to no effect on yield. However, if the deficiency is moderate to severe and lasts beyond 21 days after emergence there could be significant effects on yield. Generally, for each day that sulfur is deficient past the first 21 days after emergence there is a loss of 1 to 2 bushels per acre. It is critical that these early deficiency symptoms be fixed quickly by applying 20 lbs of sulfur/acre. The good news is that the plant readily takes up sulfur and that plants will respond quickly to applied sulfur.

Caution: Other nutrient deficiencies can show similar patterns and symptoms like those displayed by sulfur. Therefore, plant tissue analysis should always be used to confirm visual symptoms of deficiencies and to detect unseen deficiencies.

More Herbicide-Resistant Weeds on the Horizon?

By Dr. Alan York, Named Professor Emeritus-NCSU Crop Science
http://cotton.ces.ncsu.edu



Herbicide resistance in weeds is not a new phenomenon. However, as we continue to rely heavily on herbicides, we are continually exerting selection pressure for resistance. We have been promoting resistance management for years, and nearly all cotton growers are following at least some of the basic components of a resistance management strategy. It has been years since we saw a new herbicide mode of action come on the marketplace for any crop and especially cotton. Unfortunately, with the exception of dicamba in XtendFlex cotton and 2,4-D on Enlist cotton, we do not expect any new tools in the foreseeable future. Hence, we need to do what we can to discourage further selection for resistance to the herbicides we have. That is why we strongly promote mixtures of two or more PRE (preemergence) herbicides, residual herbicides mixed with the glyphosate or glufosinate applied POST (postemergence), and yes, directed layby residual herbicides. To the extent possible, we need to avoid overreliance on any single herbicide.

Of immediate concern is the PPO inhibitors. This mode of action includes the commonly used cotton herbicides flumioxazin (Valor, others) and fomesafen (Reflex, others). However, PPO inhibitors are widely used in our other crops, such as corn, soybean, tobacco, peanut, and sweet potato; see the below table *PPO Inhibiting Herbicides* for a listing of herbicides that contain a PPO inhibitor alone or mixed with another mode of action.

Resistance to PPO inhibitors in common ragweed has been confirmed in Delaware and Ohio. Tall waterhemp (a pigweed species) resistant to PPO inhibitors has been confirmed

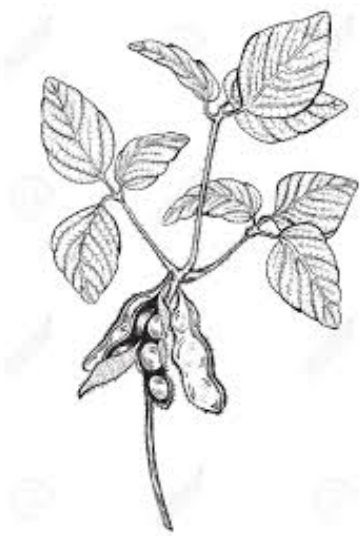
in six mid-western states. Smooth pigweed resistant to PPO inhibitors has been confirmed in Bolivia. And most alarming, Palmer amaranth resistant to PPO inhibitors has been confirmed in Arkansas. PPO-resistant Palmer amaranth is thought to also be present in Indiana, Kentucky, Mississippi, and Tennessee.

It is very likely that we have PPO-resistant common ragweed and Palmer amaranth in North Carolina. Some suspicious populations have been found, and Wes Everman and David Jordan are in the process of confirmation. Confirmation of resistance is a detailed and lengthy process.

If PPO resistance jumps on us as quickly as glyphosate resistance did, then we have some trying times ahead. A key consideration for cotton growers is whether the resistance is to PPO inhibitors applied only POST or both PRE and POST. In the case of the waterhemp in the Mid-West, the weed is resistant to PPO inhibitors applied POST but PPO inhibitors applied PRE still work. In cotton, our greatest use of PPO inhibitors is PRE. Unfortunately, the PPO-resistant Palmer amaranth in Arkansas appears to be resistant to PPO inhibitors applied PRE or POST. Peanut and soybean growers rely on PPO inhibitors both PRE and POST.

For the immediate future, we are not suggesting major changes in programs for cotton. However, for growers applying Reflex (or a generic fomesafen) PRE, the threat of PPO resistance should encourage them to mix one or even two other herbicides with other modes of action with the Reflex.

Also, cotton growers need to be watching for any Palmer amaranth or common ragweed that appears to be missed by PPO inhibitors. If there are suspicious populations, let your county agent know as soon as you suspect a problem. And, if resistance is suspected, do whatever it takes to prevent those weeds from producing seed.



Our greatest immediate concern is for soybeans simply because of the reliance we place on PPO inhibitors in that crop. With widespread resistance in Palmer amaranth to glyphosate and ALS inhibitors, the only effective currently available POST options for Palmer amaranth in Roundup Ready soybeans are PPO inhibitors; Flexstar or some product containing fomesafen is most commonly used. Additionally, most of the PRE soybean herbicides also contain a PPO inhibitor (see table below).

Choices of PRE soybean herbicides that do not contain a PPO inhibitor are limited to Boundary, Dual Magnum, Outlook, Prowl, Treflan, Warrant, and Zidua. Boundary is a good option from the standpoint that it contains two herbicides with different modes of action (*S*-metolachlor and metribuzin). However, because of the metribuzin, growers must be careful to adjust the application rate to their specific soils. Also check with your seed representative to make sure the variety you are planting is not a metribuzin-sensitive variety. If one is going to use a PPO inhibitor PRE, then a herbicide with another mode of action should be tank-mixed with the PPO inhibitor or a premix product containing a PPO inhibitor plus another herbicide which is effective on pigweed species but has a different mode of action should be selected (see table below).

PPO Inhibiting Herbicides

Brand names	Active ingredients	Mode of action[a]
Afforia	flumioxazin + thifensulfuron-methyl + tribenuron-methyl	14 + 2 + 2
Aim	carfentrazone-ethyl	14
Anthem	fluthiacet-methyl + pyroxasulfone	14 + 15
Anthem ATZ	fluthiacet-methyl + pyroxasulfone + atrazine	14 + 15 + 5
Authority Assist	sulfentrazone + imazethapyr	14 + 2
Authority First, Sonic	sulfentrazone + cloransulam-methyl	14 + 2
Authority Maxx, Authority XL	sulfentrazone + chlorimuron-ethyl	14 + 2
Authority MTZ	sulfentrazone + metribuzin	14 + 5
Broadaxe	sulfentrazone + *S*-metolachlor	14 + 15
Cheetah Max	fomesafen + glufosinate-ammonium	14 + 10
Cobra	lactofen	14
Envive	flumioxazin + chlorimuron-ethyl + thifensulfuron-methyl	14 + 2 + 2
ET	pyraflufen-ethyl	14
Fierce	flumioxazin + pyroxasulfone	14 + 15
Flexstar GT	fomesafen + glyphosate	14 + 9
Marvel	fluthiacet-methyl + fomesafen	14 + 14
Optill	saflufenacil + imazethapyr	14 + 2
Prefix	fomesafen + *S*-metolachlor	14 + 15
Resource	flumicloracpentyl ester	14
Rowl FX	flumioxazin + chlorimuron-ethyl	14 + 2
Sharpen	saflufenacil	14
Spartan	sulfentrazone	14
Spartan Charge	sulfentrazone + carfentrazone-ethyl	14 + 14
Statement	fomesafen + metolachlor	14 + 15
Storm	acifluorfen-sodium + bentazon	14 + 6
Surveil	flumioxazin + cloransulam-methyl	14 + 2
Trivence	flumioxazin + chlorimuron-ethyl + metribuzin	14 + 2 + 5
Ultra Blazer	acifluorfen-sodium	14
Valor SX	flumioxazin	14
Valor XLT	flumioxazin + chlorimuron-ethyl	14 + 2
Verdict	saflufenacil + dimethenamid-P	14 + 15
Warrant Ultra	fomesafen + acetochlor	14 + 15

[a] Numbers refer to mode of action.
2 = ALS inhibition
5 = photosystem II inhibition
9 = EPSP synthase inhibition
10 = glutamine synthase inhibition
14 = PPO inhibition
15 = Very long-chain fatty acid inhibition

We use a lot of glufosinate (Liberty, others) in cotton and we are beginning to use more of it in soybeans. Whether or not we run into resistance with glufosinate remains to be seen. However, we are putting a lot of glufosinate selection pressure on our weeds, and resistance is not unexpected. In an effort to preserve the utility of Liberty, a glufosinate-based program should include a strong residual PRE herbicide(s) and a residual herbicide such as Dual Magnum, Outlook, or Warrant mixed with the glufosinate applied POST. Additionally, weed size is critical with glufosinate. Palmer amaranth should be at most 3 inches tall when treated. Remember it can grow an inch a day. Treating weeds beyond the appropriate growth stage is asking for trouble. Also, glufosinate acts as a contact herbicide, hence good spray coverage is important. Large droplets and low spray volumes are not conducive to good control with glufosinate.

~~~~~~

Roundup Ready 2 Extend Soybean Varieties

Dr. Jim Dunphy, Crop Science Extension Specialist (Soybeans), NCSU
Dr. Wes Everman, Crop Science Extension Specialist (Weed Management), NCSU
Katherine Stowe, Research Director, NC Soybean Producers Assn., Inc.Inc.

‘Roundup Ready 2 Extend’ (RR2X) soybean varieties are now becoming available on the market. Farmers should be aware of some significant concerns about use of these varieties.

As of May 2, 2016, these seed were not approved for sale in Europe. Perdue is not encouraging use of these varieties before they are approved in Europe, but have told producers and suppliers they will work with them to provide a domestic outlet. Farmers who plan to sell grain of these varieties to Perdue need to notify Perdue in writing of their interest, and Perdue will notify them of where the soybeans need to be delivered this fall. We’re not aware that anyone else buying soybeans from farmers in North Carolina is committed to buying RR2X soybeans and keeping them separate from soybeans being shipped to Europe. It could happen, but so far it hasn’t (to our knowledge). And Europe could approve them tomorrow, but so far they haven’t.

We think that NC farmers should hope that no RR2X soybeans show up in Europe. The publicity would not be a good thing, and one farmer (assuming they can find him or her) will probably be out a lot of money.

Unless Europe approves RR2X soybeans by harvest time, farmers will have to worry about keeping any RR2X soybeans from contaminating their legal commodity soybeans. How clean can they keep their combine, their truck(s), and their bin(s)?

Add on the reality that as of today (5/2/16), these varieties cannot be legally sprayed with any formulation of dicamba. **Keep these thoughts in mind when making decisions about this year’s soybean crop.**
~~~~~~

Soybean Planting Rates

Questions may arise this soybean growing season about increasing plant populations due to poorer seed quality and lower germination percentages than usual. Dr. Jim Dunphy, NCSU Soybean Specialist, has provided the chart below to help aid in plant population decisions. The chart is a little different from usual recommended stand populations, and is focused more on producers "preferred planting rates". The focus is more on plants per acre to end up with, than on planting rates to achieve those stands (plus some extra seed as insurance to get the desired stand).

Dr. Dunphy picked 75,000, 90,000. amd 100,000 plants per acre as a stand that he considers adequate for maintaining yield when planted in May, June, or July, respectively.

	Seeds/Acre		
	Final Stand (plants/Acre)		
% Germ.	75,000	90,000	100,000
90%	83,333	100,000	111,111
85%	88,235	105,882	117,647
80%	93,750	112,500	125,000
75%	100,000	120,000	133,333
70%	107,143	128,571	142,857

To adjust planting rate for a lower germination %, divide the seeds/Acre at the current germination % (in any column) by the seeds/Acre you usually figure on, to get the adjustment factor to multiply your usual planting rate by. Or if it's easier to work with, increase your usual planting rate by the percentage indicated by the two digits after the decimal in your adjustment factor. For example, 120,000/105,882 = 1.13 adjustment factor, or increse the usual rate by 13%, because you have 75% germiantion this year instead of your usual 85%.

Onslow County Multipurpose Complex
NC Cooperative Extension Services
4024 Richlands Highway
Jacksonville, NC 28540
910-455-5873 /910-455-0977 FAX
http://www/ces/ncsu/edu/onslow/