Corn and Grain Sorghum Weekly Update – April 1, 2016

2016 Update No 2

<u>Corn and Grain Sorghum Update</u> – Dr Jason Kelley (Wheat and Feed Grains Specialist)

March rainfall continues to hamper corn planting. Another round of rain came through on Wednesday and Thursday of this week with most areas in the delta region of eastern Arkansas receiving 2-4 inches, with locally higher amounts. For most areas of the delta, March has been the wettest on record. Corn planting is lagging behind according to the March 27th Arkansas Agricultural Statistics Service report with 8% of the crop planted, compared to only 1% last year and 20% for the 5-year average. This may be a little deceiving, since the 5-year average would include 2012, a year when a high percentage of corn was planted very early. A considerable amount of corn was planted earlier this week prior to the rain. Currently the extended weather forecast looks favorable for drying and potentially planting later next week. I am not aware of any grain sorghum that has been planted yet.

<u>Corn Fertility Update</u> – Dr Trent Roberts (Assistant Professor, Crop, Soil & Environmental Science)

Managing Zinc Fertility in Corn

Corn, like rice, is prone to Zn deficiency and proper management of this micronutrient can enhance yield potential, but can be costly if not managed properly. Zinc deficiencies in corn are often seen early in the growing season between emergence and V6 stage when the corn has a limited root system and soils tend to be cool and wet. As with many nutrients, a proactive approach to identify fields where Zn deficiency is likely to occur through proper soil sampling and analysis is always the best. When Zn deficiencies are observed the sooner they are corrected the better. There are many factors that can lead to Zn deficiency in corn and when several of them occur in conjunction they can lead to severe deficiency symptoms.

Factors influencing Zn availability and uptake in corn are:

1) Cold and wet or waterlogged soils- These conditions tend to limit both Zn availability in the soil as well as plant shoot and root growth. These conditions can oftentimes be overcome as the soils dry, soil temperature increases and corn plants increase growth with little to no expected yield loss.
2) Soils with high pH (>6.0)- Many of the groundwater-irrigated soils of the Delta fall into this category and the addition of calcium carbonates over time has increased the soil pH of many fields above 7.0. Soil Zn availability decreases 100-fold for every 1 unit increase in soil pH (i.e., from 6.0 to 7.0) due to the “tie up” or “binding” of Zn in chemical compounds that are not readily available for plant uptake.

3) Soils with high soil-test P -The majority of soils in the Delta test in the medium, low or very low soil-test P categories, and receive recommendations for very high P fertilizer rates. Either high soil-test P or high rates of P fertilization can increase the potential for Zn deficiencies in corn as P interferes with the plant's Zn metabolism.

Knowing the factors that influence Zn availability in the soil and ultimately corn uptake of Zn are important and can help you develop a sound Zn fertilization program. Soil testing for Zn is the first step in developing a Zn management program for corn. Soil samples for routine analysis of nutrients for corn in Arkansas should be taken to a 6 inch depth. The following table outlines the Zn application rates based on soil-test (Mehlich-3) Zn level and soil pH.

	Soil-Test Zn Level and Concentration Range				
	Very Low	Low	Medium	Optimum	Above Optimum
	<1.6	1.6-2.5	2.6-4.0	4.0-8.0	>8.0
Soil pH	Zn Fertilizer Rate in lbs of Actual Zn/acre				
>6.0	10	10	10	0	0
<6.0	5-10	0	0	0	0

The Zn fertilization rates for soils that have pH >6.0 are 10 lbs of actual Zn per acre for the Very Low, Low and Medium soil-test Zn categories. The rate of 10 lb Zn/acre is to supply adequate Zn to avoid nutrient deficiencies and provide adequate spatial distribution of Zn granules throughout the soil. The addition of 10 lb of actual Zn/acre will also help to build soil test Zn and reduce the need for Zn fertilization of future crops. Zinc sulfate granules applied to the soil surface prior to or at-planting need to be incorporated into the beds. To supply 10 lb of actual Zn per acre, 28 lbs of a granular Zn sulfate fertilizer with an analysis of 35.5% Zn is needed to supply 10 lb actual Zn/acre. The fertilizer granules should be applied and incorporated into the bed prior to planting to achieve the best results. Incorporating the granules into the bed concentrates the fertilizer in the bed within the seedling corn root zone which is important since Zn is relatively immobile in the soil. If you are unwilling to re-pull beds to incorporate granular Zn sulfate, then using an in-furrow, 2 x 2 or post-emergence (foliar) application of and appropriate Zn source is a better investment than broadcasting granular Zn sulfate onto the soil surface. For producers that do not want to re-pull beds, applying liquid Zn in-furrow or in a 2 x 2 can achieve similar results with an appropriate Zn rate and source.

There are many Zn sources available to use for foliar Zn fertilization or for rescue applications to correct Zn deficiencies post emergence although these are not always as effective as preventing the deficiency through adequate soil-applied Zn prior to planting. Chelated Zn sources such as Zn EDTA are the best option for foliar Zn applications because they typically result in less leaf burn and should be applied at 1 lb actual Zn/acre (~1 gallon/acre for most chelated Zn sources). Chelated Zn as Zn EDTA has both foliar and soil activity meaning that foliar sprays which do not come in contact with leaf, but hit the soil surface can also be taken up by the corn plant. Unlike Zn sulfate, chelated Zn EDTA is mobile in the soil which can be incorporated with rainfall or irrigation. Generally, Zn EDTA can be safely applied with atrazine and glyphosate post-emergence in corn. Non-chelated Zn sources can also be used for fertilization and correction of Zn deficiencies post-emergence, but non-chelated sources will likely result in foliar uptake of Zn with little to no root uptake. Therefore non-chelated Zn sources which do not

come in contact with the leaf, but land on the soil surface are not readily plant available and the selection of foliar Zn source should be based on leaf area at time of application.

There are three important factors to consider when choosing either a granular or foliar Zn source:

1) Choose a quality product from a reputable manufacturer.
2) Pay close attention to the analysis (%Zn) and if the product is liquid- what type, if any chelating agent is used. For liquid or foliar Zn sources EDTA is the Cadillac of chelating agents, but there are several others that are also effective.
3) Water solubility of the Zn contained within the product is of utmost importance. Zn sulfates and Zn chelates tend to be 100% water soluble. However, Zn oxides and Zn oxysulfates are much less soluble. In order to be considered an effective soil-applied Zn fertilizer the product must contain at least 50% water soluble Zn. Some products will list both the Zn analysis of the product as well as the % of the Zn that is water soluble. For instance if a product contains 20% Zn and of that 14% is water soluble then that product would meet the requirement because 70% of the Zn (14%/20%) is water soluble.

Overall, Zn is a micronutrient that is often hard to manage in our alkaline soils and can be a costly part of any corn fertilization program. However, research shows there are many different options that producers have at their disposal to manage Zn effectively. As long as you are diligent about the products, rates and application strategies that you implement the money spent on Zn fertilizer will be well worth it. Due to the difficult nature of Zn to manage in our soils and production systems, it is always better to hedge on the safe side rather than pinch pennies and face deficiencies later in the season. Zinc deficiencies that go uncorrected can rob yield potential and it will cost relatively the same amount to correct the deficiency in-season as a preplant-incorporated application prior to planting.

<u>Corn and Grain Sorghum Research Verification</u> – Kevin Lawson (Corn & GS Verification Coordinator)

Four of the seven Corn Verification Fields have been planted. Fields planted early last week are emerging. Heavy rains on March 30 eroded about ½" off the beds in Lincoln County. This field will be monitored closely for any problems from this situation. The Pope, Jefferson and River Valley fields are waiting on the fields to dry and are looking at planting in the next two weeks.

County	Hybrid	Growth Stage	Heat Units	Comments
Clay	Pioneer 1637YHR	Planted	---	Field was planted on March 28 at 34,500 seeds per acre.
Lincoln	DKC 66-87 VT2P	Emerge	139	Field was planted on March 21 and emerged on March 31. Will take plant population counts next week. (Scouted March 31)
Prairie	Armor 1555PRO2	Planted	---	Field was planted on March 29 at 35,000 seeds per acre.
St Francis	Pioneer 2089YHR	Planted	---	Field was planted on March 22 at 35,000 seeds per acre.

Southeast Arkansas Update – Kevin Norton (Ashley County)

Corn planting was in full swing early this week. Approximately 1/3 of Ashley County acres were planted prior to Wednesday rains. Most corn (almost all) planted before the March 9 rains will have to be replanted. Rainfall totals ranged from 2.75 inches to 4.5 inches. The Bayou Bartholomew is out of its banks and spreading. Any low areas close to the bayou are still flooded and will probably not dry out soon enough to plant corn. Producers in these areas may be shifting intended plantings away from corn to cotton, rice or beans, depending on the soil type.

Central Arkansas Update – Brett Gordon (White County)

Corn planting has officially started this past week in White County; however, planted acreage is limited. Most producers I've spoken with are waiting until after the mid-week storm system passes to begin planting fields. Field conditions have been perfect for working ground. Almost all the producers in my area have been busy applying burndowns, conducting tillage operations, and pulling beds. If the weather stays dry next week, I expect planting operations to continue full swing.

Northeast Arkansas Update – Stewart Runsick (Clay County)

Corn planting began in Clay County March 21st. We got a little shower on March 24th that didn't amount to much. Planting resumed this week March 28th. A significant amount of acres have been planted, but not 50% yet. Temperatures have been in the 40's and 50's dipping to near freezing at night. Nothing has emerged yet. The Corn Research Verification field was planted March 28th and one of our Hybrid trials is in the ground. Rainfall is expected this week which should delay the rest of the planning until April.

River Valley Update – Kevin VanPelt (Conway County)

Soil temperatures started reaching 60 degrees in the River Valley last week. Some producers got started planting corn in between rain events, while most decided to wait till after the rain forecast for the middle of the week. We received 2 inches of rain over Wednesday (March 30) and Thursday (March 31), but if the forecast for warm dry weather holds through next week I expect that a majority of the corn acres will get planted.

Heat Units

Heat units were fairly high this week vs the 30 year average. Corn generally needs around 140 to 150 heat units to emerge. With these kinds of temperatures it is taking about 10 days for corn to emerge.

	Southeast, AR (Dumas)		Central, AR (Des Arc)		Northeast, AR (Jonesboro)		River Valley (Morrilton)	
	2016	30 Year	2016	30 Year	2016	30 Year	2016	30 Year
March 28	8.0	10.0	7.5	8.5	6.5	7.5	8.0	8.5
March 29	11.5	10.5	11.0	8.5	8.5	8.0	10.5	9.0
March 30	17.5	10.5	15.5	8.5	11.0	8.0	13.0	9.0
March 31	16.0	10.5	15.0	9.0	12.5	8.0	14.5	9.0
April 1	9.5	10.5	8.0	9.0	7.0	8.5	8.0	9.0
Total for Week	**63**	**52**	**57**	**44**	**46**	**40**	**54**	**45**
Total Since March 28	**63**	**52**	**57**	**44**	**46**	**40**	**54**	**45**

Twitter

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University of Arkansas Systems Division of Agriculture Cooperative Extension Service Web Pages

Extension Corn Webpage – www.uaex.edu/corn

Extension Grain Sorghum Webpage – www.uaex.edu/grain-sorghum

Row Crop Verification Webpage – www.uaex.edu/verification