After corn has emerged it is important that you access your final stands. Corn plant populations are a critical component of achieving good yields. Often poor weather, planter problems, or insect damage cause growers to obtain final stands that are far less than desired. For most, 5-7 stops in the field will be adequate. Here measure off 17.5 feet (for 30 inch rows) at each stop. Count the number of seedling corn plants that are up in this amount of row. Next take this number and multiple by 1000. This will give you plants per acre and aid in any replant decisions you are facing!

### Stand Count Formulas

<table>
<thead>
<tr>
<th>Rows</th>
<th>Formula</th>
<th>Final Stand Plants/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>30&quot;</td>
<td>Number of plants in 17.5 ft of row X 1000</td>
<td>= Final Stand (plants/acre)</td>
</tr>
<tr>
<td>20&quot;</td>
<td>Number of plants in 26 ft row X 1000</td>
<td>= Final Stand (plants/acre)</td>
</tr>
<tr>
<td>15&quot;</td>
<td>Number of plants in 35 ft of row X 1000</td>
<td>= Final Stand Plants/acre</td>
</tr>
</tbody>
</table>

### Cutworms in Corn

We have had several reports of cutworms in corn in the Stanly and Union County area. Cutworms are normally found by no rhyme or reason. By that I mean there is no consistent or predictable pattern to cutworm occurrence. However, with that being said we do know that cutworm activity is normally highest during periods of low sunshine or night. They are also more numerous in fields having heavy residue and weed growth during the preceding, winter, or early spring. Cutworms are also more common in no till situations compared to tilled soils.

Cutworms normally attack small seedlings (normally plants that are less than 8 leaf stage). They cut off small stem seedling and bore a hole near the ground level. Once seedlings are cut the caterpillar
Turn Rows

Cutworms in Corn...continued

most often attempts to pull it into the soil before fully consuming the plant.

Granular and spray insecticide formulations can be useful against cutworms. Certain at plant granular insecticides will give some suppression of cutworms but will not adequately control severe infestations. Broadcast or banded spray formulations of pyrethroid insecticides (e.g. Pounce or Warrior) can be effective.

**Seed treatment insecticides will give little protection against cutworm injury!**

**Threshold: 10% cut seedlings** (reduce threshold by 1/3 if thin stands are encountered)

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**Corn Management: Question & Answer**

*What is the economic advantage to narrow vs. wide rows?*

The section on narrow row corn covers the economic considerations to narrow row corn. In general, narrow row corn results in a 6-8% yield increase. However, the extra cost of changing equipment averages around $20,000. This means that to increase profits in changing to narrow rows a grower must farm over 350 acres of corn.

*What guidelines can you give me on timing nitrogen applications? Should I put all my nitrogen down at planting or in a split application?*

Split nitrogen applications produce higher yields (10-15 bu/acre) than putting all the nitrogen on at planting. Current recommendations are to split apply your nitrogen, particularly on sandy soils.

*What nitrogen rates should I be using on continuous no-till corn?*

Nitrogen rates should be related to soil productivity. The higher the yield potential the more nitrogen should be used. However, no-till soils present more of a problem in that the recycling of organic materials helps hold and release nitrogen to the crop. More research is needed in these systems to find optimum nitrogen rates. Currently, recommendations are to use 1 to 1.25 lbs of nitrogen for each bushel of corn harvested.

*What are the advantages or disadvantages of new aeration tools on no-till fields in fall or spring?*

The primary advantage of aeration tools for no-till systems should come in the spring when the greater porosity should help increase moisture penetration into the soil and provide quicker drying and warming of the soil surface. Remember, the key problem with no-till systems is getting the corn planted into soil that is warm enough to allow for quick germination and emergence. As for the loss of mulch, one would expect less ground cover with these tools, but not so much as to reduce the impact of mulch on soil erosion or moisture holding capacity. Once could also expect that in these warmer soils weed emergence would be greater early in the spring.

*Do the benefits of DGPS systems justify the high cost of the equipment or the services?*

The purpose of DGPS equipment, yield monitors, grid soil sampling, and variable rate applications is to use soil or yield information to improve yield or to reduce inputs. To do this a grower must get accurate information at a reasonable cost, and then must act on this information in a way that improves profits. In the case of variable rate lime applications, these technologies are improving profit by both reducing lime applied and increasing yield. Yield monitors have also produced information that has resulted in increased yields. Pre-2008, a grower who farms over 250 acres of corn can pay for a yield monitor in five years through increases in corn yields brought about by learning which hybrids produce best on what soils. Other practices have not been as profitable. Changing phosphorus or potassium rates based on grid soil tests or changing seeding rates have not resulted in consistent yield increases and have not increased corn profits. A grower must carefully evaluate an investment in new technologies by considering how this information can help improve the decisions he makes in managing corn production.

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Recommendations for the use of chemicals are included as a convenience to the reader. The use of brand names and any mention or listing of commercial products or services in this publication does not imply endorsement by North Carolina State University, North Carolina A&T State University or North Carolina Cooperative Extension nor discrimination against similar products or services not mentioned. Individuals who use chemicals are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Be sure to obtain current information about usage regulations and examine a current product label before applying any chemical.
Mother Nature Throws Another Curve!

The areas wheat crop appears to have dodged the recent cold snap last week with little if any damage. As you can see in the chart below the magic temperature for wheat in the boot through the early heading stage of development is 28 degrees and perhaps just as critical as the temperature is the duration of the cold, to receive signification damage the 28 degrees would need to occur for a period of 4 hours.

High Aphid Populations Occurring

Two species of aphids are predominant in small grains: the English grain aphid and the bird cherry-oat aphid. Scouting for aphids requires searching plants or examining heads on 10 samples taken at locations scattered across each field. Each sample should consist of all plants in 1 foot of row or 10 heads, depending on plant stage. Counting aphids is not feasible; instead, a simple estimation technique should be used.

Spring populations of aphids may become much more abundant than fall populations. However, because plants are actively growing, they can support many more aphids without injury. Also, the spring-transmitted yellow dwarf virus usually does not seriously affect plants. Aphids may occur throughout a field but more commonly build up in “hot spots.” These insects may be found over the entire plant, including in the heads and at the base of plants. From 100 to 300 foliage-feeding insects must be present per row-foot before insecticides are economically justified, and head-infesting aphids may reduce yields if there are 25 or more insects per head.

Spring Thresholds
- In spring when the plants are 4 to 8 inches tall, 200 aphids per foot;
- In spring when the plants are 9 to 16 inches tall, 300 aphids per foot; and
- In spring after heading, 25 aphids per head with 90 percent of heads infested, or 50 per head if only 50 percent of the heads are infested.

Cereal Leaf Beetles Beginning to Appear

The economic threshold is 25 eggs and/or larvae per 100 tillers. This economic threshold replaces the previous threshold that was based on delayed scouting for large larvae. It is recommended to scout every 5 to 7 days once egg laying has begun. Cereal leaf beetles are easily controlled with low rates of several insecticides, check with your crop protection dealer for product availability.
Molybdenum for Soybeans?

We have had several calls the past few weeks concerning the plant nutrient molybdenum and its use in the 2008 soybean crop. Molybdenum is required for nitrogen metabolism in leaf tissue and for nitrogen fixation. Deficiencies of molybdenum are typically observed in highly acid soils that are strongly weathered and leached and also soils in which the element is in an unusable form. The deficiency greatly reduces yields. Symptoms of this deficiency resemble those of nitrogen and are probably caused indirectly by reduced nitrogen utilization rather than directly by the lack of molybdenum. Leaves are pale green or yellow, necrotic, and twisted. The necrosis is confined largely to the margins, midribs, and interveinal areas.

Molybdenum deficiency can be corrected with foliar sprays of sodium molybdate or ammonium molybdate. In most soils, the deficiency can be remedied by liming the soil to a pH of 6.0 - 6.3. If you have a recent soil sample refer to it, the sample results will indicate if molybdenum is needed. If you don’t have a recent soil sample our recommendation is that you obtain one and take some of the guess work out of your soil fertility program.

Fertilizer Additives

Several weeks back a request was made to our specialist at NCSU for information concerning the fertilizer enhancement materials that are currently being sold throughout the area. The following is the response received:

From: Deanna Osmond and Carl Crozier (Soil Science) Jim Dunphy, Keith Edminsten, Loren Fisher, Ron Heiniger, and Randy Weisz (Crop Science), David Hardy (NCDA &CS)

Specialty Fertilizer Products, LLC is currently marketing two products through Southern States Cooperative, Nutrisphere-N and AVAIL (more than 1 formulation each). We have had many questions about these two fertilizer additives — Avail (for phosphorus fertilizers) and Nutrisphere (for nitrogen fertilizers). The intent of this memo is to present available information and to discuss current research plans.

Theoretical estimation of the potential effect on Soil CEC Due to Organic Polymer Additions:

Neither AVAIL or Nutrisphere-N supplies plant nutrients; instead their mechanism of action is due to the large net negative charge and thus cation exchange capacity of the maleic itaconic copolymer. Like other soil amendments, the effectiveness depends on the rate of product applied and the mode of action of the material. The actual rate of copolymer applied to the soil can be calculated from the fertilizer rate, the recommended product rate per unit fertilizer, and product. The estimated change in soil CEC can be calculated from the existing soil CEC (from a standard soil test report), the product CEC, and the product rate using a weighted average approach. If 1 lb/ac of copolymer with a CEC of 250 meq/100 g is incorporated into the top 6 inches of a sandy soil with a CEC of 4 meq/100 g, only a miniscule increase in soil CEC is expected (from 4.0000 to 4.0001 meq/100 g) since this small amount of polymer is diluted by the approximately 2 million pounds of topsoil per acre. The copolymer product is sometimes band-applied and only mixes with a small fraction of the soil volume. Even if only 0.1% of the soil mixes with the product (a 1/2-inch wide strip every 30 inches, with only 1/2-inches vertically out of the 6-inch topsoil) the copolymer product is still diluted by 2,000 lb of topsoil per acre. The increase in soil CEC expected.
with 1 lb/ac of copolymer in this highly restrictive band is still small (from 4.00 to 4.12 meq/100 g). Based on these calculations we would expect this small change in CEC to have little impact on nutrient availability.

**Field Trials with Avail:** In 2007, Dr. Heiniger tested Avail on corn with starter fertilizer at five locations and Drs. Osmond and Hardy at three locations (2 soil types per location and both grain and silage). Results from all eight of these tests showed that at recommended starter fertilizer rates, there was no yield advantage with Avail. In the trials of Osmond and Hardy, which were on soils testing medium to very high for phosphorus, nitrogen-only starter fertilizer did statistically as well as nitrogen + phosphorus starter or nitrogen + phosphorus + Avail starter (see Figures 1 and 2 on Page 3). Avail trials are planned in corn and tobacco for 2008. Drs. Heiniger, Osmond and Hardy will conduct corn trials. Dr. Heiniger will run two trials (Pasquotank and Pamlico Counties) using banded 11-27-0, with and without Avail. Drs. Osmond and Hardy will repeat the 2007 trial at the same locations. In addition, they will have a phosphorus rate study, with and without Avail on low soil test phosphorus locations (coastal plain and piedmont). Dr. Fisher will test Avail on a low soil test P soil (Stokes County) and a high soil test P soil with tobacco.

**Field Trials with Nutrisphere-N:** Yield studies using Nutrisphere-N have proven inconclusive and mixed. A recent popular press article describes research by two scientists; yield increases with the use of Nutrisphere-N were seen by one of the two researchers [http://www.agriculture.com/ag/story.jhtml?storyid=/templatedata/ag/story/data/1205351323541.xml&ordersrc=rafstory](http://www.agriculture.com/ag/story.jhtml?storyid=/templatedata/ag/story/data/1205351323541.xml&ordersrc=rafstory).

A recent on-farm test in Virginia showed no advantage to using Nutrisphere-N [http://www.ext.vt.edu/pubs/grains/424-050-07/424-050-07.html#L7](http://www.ext.vt.edu/pubs/grains/424-050-07/424-050-07.html#L7) nor did rice research that was presented at the Southern Branch of the American Society of Agronomy meeting. Although, research conducted in North Carolina by Dr. Heiniger showed no difference in average yield between UAN and UAN+Nutrisphere-N, there was, however, a statistical increase in yield due to Nutrisphere-N at the lower application rates when all fertilizer was applied at planting. As application of all N fertilizer at planting is not a recommended practice, Dr. Heiniger plans a larger testing program in 2008. Nutrisphere-N trials on corn will again be conducted in 2008. Dr. Heiniger will have two trials comparing UAN and UAN+Nutrisphere-N at five nitrogen rates and two different application times. Dr. Osmond will conduct three trials (coastal plain, piedmont, and mountains) to compare four nitrogen fertilizers (ESN, UAN, UAN+Nutrisphere-N, UCAN23) at five different nitrogen rates. Drs. Osmond and Weisz have wheat trials at two locations comparing the same nitrogen fertilizers at five different nitrogen rates. Dr. Fisher will have a tobacco trial to evaluate Nutrisphere-N.

**Current Conclusions:** We clearly do not have strong evidence to support the use of these products at this time. However, before providing more guidance on these materials, we need at least two years of data. Those of us working with these materials expect that within the next six to nine months we will have better NC-based research to present.
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10 am - 12 Noon

Pesticide Specialty Training
Two (2) hour credit: A B G H I K L M N O T D X Categories
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