

New York State Starter N Project

Field Protocol
3-28-2011

Cornell
Nutrient Management Spear Program

Goal and field selection

Goal:

- Determine if starter N is needed for manured fields (i.e. if manure can replace need for starter N fertilizer so corn can be planted without any fertilizer).

Field selection:

- Identify 2nd or higher year corn fields **with sufficient P and K** (i.e. no additional P and K needed).

Field selection and trial establishment

Field information

- Document the field history (manure use in the last three years, manure use this year, fertilizer use this year (includes sidedressing amounts if sidedressing is done), soil type, rotation, past soil test, etc.).
- Use the form supplied for the project and mail to Quirine
- Final submission of forms at PSNT time so we have the field database in place mid-season

Design – Only N in the starter!!

- Per field, implement starter N rate studies in four replications (0 and 30 lbs N/acre; NO P OR K in fertilizer!!).
- Mark front and back corners of each plot with **plastic flags**
- Flag discussion (color availability) and secondary markers

Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8
No starter	30 lbs N	30 lbs N	No starter	30 lbs N	No starter	No starter	30 lbs N
Replicate 1		Replicate 2		Replicate 3		Replicate 4	

How many rows?

- Twice the chopper width if possible
 - 6 row chopper
 - Plots of 12 rows wide (two passes with a 6 row planter or one with a 12 row planter, or a split fertilizer approach for 24 row planters...12 with and 12 without starter)
 - 4 row chopper
 - Plots of 8 rows (two passes of a 4 row planter)
- If planter and chopper aren't multiples of each other, contact us to determine the design

How long are the plots?

- Target plot length so that a harvest truck is 3/4th full.
- This “ensures” the truck won’t overflow if we have a high yielding year or insufficient weight in drought years
- Usual length varies from 350 feet up to 1000 feet depending on field size, chopper width and farm equipment

Communication

- Ensure buy-in by the farm...to avoid loss of plots due to lack of communication
- Contact us when you have a farm identified and plots established so we know how many trials there are and where they are
- Call a few days before soil sampling at PSNT time...if possible, one of us will be there to sample and do row counts with you

When the corn is 6-12 inches tall

Take soil samples at PSNT time

- Sample soil when the corn is between 6 and 12 inches tall.
- This sampling **HAS TO HAPPEN BEFORE A FARM SIDEDRESSES IF THE FARM PLANS TO SIDEDRESS....**
- **0-8 inches and 0-12 inches, next to each other (2 bags per plot)**
- Take **15 cores per plot**, zigzagging through the center of the plots (i.e. within the area that is actually going to be harvested).
- Mark the samples with plot and depth (as well as farm name) and mail the 16 samples to Quirine for processing (we can take them back to campus if one of us is there with you)

Sample 0-8 and 0-12 inches depth
Sample right next to each other...



Other data collection at PSNT time

- Measure population density (40 feet row length; count corn plants on the left and the right of the tape, 2 readings per plot).
- Estimate plant height to whorl for each plot.
- Take pictures of each plot, standing in between the middle rows of each plot.





At harvest

Cut the headlands and extra rows around the 8 plots prior to harvest of the plots



Clearly mark plots for the chopper and direct the driver to the right plot (1 through 8)



Leave the border rows in each plot standing so you can take stalk nitrate samples (15 per plot) after the plots are harvested.



Cutting the Stalk



First, measure up 14 inches



Cut so 14 inch stubble remains

Cutting the Stalk



Measure 6 inches from the soil



This leaves an 8 inch stalk

CSNT

- During sampling, don't touch the soil with the stalk; soil contamination will adversely affect test results.
- Once the stalks are taken, quarter them lengthwise, and place in a brown paper bag; this speeds the drying process and reduces the possibility of mold growth.

Quartering



Carefully quarter the stalk using a machete or kitchen knife

Quartering



Quartering is a quick and easy way to ensure that a quality sample arrives at the laboratory.

Mail stalk samples to us right away to avoid molding of the samples. List farm and plot number for the 8 bags per trial. Let us know you mailed them to us so we can look out for them.

Mail samples (CSNT and forage samples) to:

Quirine Ketterings
Nutrient Management Spear Program
323 Morrison Hall
Department of Animal Science
Cornell University, Ithaca NY 14853

Use a measuring wheel to determine the length of each of the eight plots. Note down the length of the plot and the width of the chopper (number of rows and row spacing...15 versus 30 inch rows) and mail that info plus plot weight to us when you submit CSNT and forage samples



Weigh at the farm if possible (drivers should have a plot tag to put down plot number, empty and full weight).



Alternative is trouper scales in the field...less convenient, more variable.



Have someone at the bunk to take the eight subsamples for moisture and forage quality (1 gallon bag)...walk around and reach into the pile at varying depths to get a representative sample. Make sure bags are labeled with farm and plot number.



At the end we should have

Completed field information form (one per trial)

For each of the 8 plots per trial:

- Population density
- 0-8 inch soil samples (Cornell Morgan soil test and ISNT analyses)
- 0-12 inch soil samples (for PSNT)
- Plant height at soil sampling time
- Plot pictures at soil sampling time
- Yield at time of harvest (field weights)
- 1-gallon bags with forage for moisture content and forage quality determination
- Corn stalk nitrate test samples
- Report of any anomalies (skips, wet spots, bird, insect, weed problems, etc.)



Final reporting

We will process samples and summarize the data after harvest and generate a 3-year summary report, building on the results to date.

Questions:

Quirine Ketterings at gmk2@cornell.edu or 607 255 3061 (office) or 607 229 0120 (cell) Greg Godwin at gsg6@cornell.edu or 607-279-4627 (cell)