

# On-Farm Research Partnership

## Nitrogen Need of Winter Cereals

### Cover Crops as Double Crops

### Trial Layout and Measurements

-----2014 Spring trials-----

(Revised March 5, 2014)

Cover crops have received increasing interest from farmers in recent years. The reasons vary from erosion control and nutrient uptake to improved soil quality, increasing organic matter and field trafficability. Due to the drought in 2012, more farmers are interested in growing winter cereals as double crop, benefiting from the protection offered by cover crops and harvesting the cereal as forage in May to increase per acre crop yields. Properly managed, these crops can supply 2-4 tons of dry matter per acre, and in some fields in 2012 we measured up to 5 tons of dry matter of high quality forage from winter cereals planted after corn silage, even with little growth in the fall. Our main question with growing winter cereals for forage is: how much N do we need at green-up for optimal economic yield? In 2013, 45 on-farm trials were completed. On-farm trials are needed this spring of 2014 to complete two years of data collection and quantify crop response to N addition at greenup.

#### Goal:

- Determine the nitrogen need of winter cereals (cereal rye, triticale, wheat) seeded after corn silage harvest and harvested for forage prior to corn planting in May.

#### Approach:

- Identify homogeneous looking areas of 65 by 80 feet in fields that were seeded to rye, triticale or wheat after corn silage harvest in fall of 2013.
- Let us know once a site is confirmed. We will distribute flags, poles, and pre-weighted bags of fertilizer for hand-application to each plot.
- Document the field history (seeding rate, method and date, manure and/or fertilizer use at seeding, soil type, past soil test, etc.).
- Per field (per 65 by 80 foot area), implement N rate studies in four reps using the maps on page 4 of this project outline. Fertilized plots are 10-ft by 10-ft with a 5-ft buffer between plots and the surrounding field. Each trial should have a control treatment where no N fertilizer is added, plus four additional N rates: 30, 60, 90, and 120 lbs N/acre.
- Manure or fertilizer addition prior to, during, or shortly after cover crop seeding is ok but should be consistent across all plots and be documented on the field history form.

- Measurements (5 treatments x 4 reps = 20 plots per trial)
  - **At green-up early 2014**
    1. Mark out the trial using the design on page 4 of this document. The final implementation should have 20 plots.
    2. For each plot, take SOIL SAMPLES (0-8 inch depth; prior to fertilizer application): 8 samples per plot, mixed well. Make sure to take the samples within the 10x10-ft plot area where the N fertilizer will be applied but avoid trampling of the area. We will analyze the soil samples for standard fertility (Cornell Morgan) and Illinois Soil Nitrogen Test.
    3. Apply the fertilizer on the 10 x 10-ft plots according to the design on page 4.
    4. Clearly mark the full 65-ft by 80-ft area to indicate that no additional fertilizer or manure should be spread on the trial area. Use poles and rope to mark the outside boundaries of the whole location. Ensure the farmer knows where the trial area is and understands no fertilizer or manure should be applied to this area.
    5. Avoid use of metal flags...plastic works just as well and is less risky with field equipment.
  - **At harvest in May 2014**
    1. Take pictures so we have a record of visual differences or the lack thereof.
    2. Harvest the winter cereal at flag leaf stage (couple of days prior to the date targeted for harvest of the entire field by the farmer: Use a 2 square foot frame to cut the crop at harvest height (4 inches) at three locations in each 10 x 10-ft plot. Combine the content of the three frames per plot in one bag. Fold over the top of the sample bag and write farm name, field ID number (plot number), and sampling date on bag before leaving the field. ***In total, each bag should contain the harvest of three 2-square foot areas.*** You should end up with 20 harvest bags, one each for the 20 plots. We will determine total DM yield and forage quality for each harvest sample.
    3. Bagged samples and data sheets go to NMSP at Cornell for processing and analysis: Quirine Ketterings (323 Morrison Hall, Department of Animal Science, Cornell University, Ithaca, NY 14853).
    4. Remove all flags and poles.

If you have a farm and field identified, please let us know so we can get your pre-labeled fertilizer bags, flags, poles, and sampling containers/bags for the soil sampling rounds and the forage quality samples.

**No samples can be processed without a completed field history form.**

**Each farm/collaborator will receive an individual report for his/her/their site, as well as a summary report for all trials to be conducted in the spring of 2014.**

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

BY BEING AN ON-FARM RESEARCH PARTNER, YOUR FARM DATA BECOME PART OF A STATEWIDE DATASET THAT BENEFITS THE AGRICULTURAL INDUSTRY. SUCH A DATASET IS ESSENTIAL FOR FINE TUNING OF OUR LAND GRANT UNIVERSITY GUIDELINES.

## New York On-Farm Research Partnership

<http://nmsp.cals.cornell.edu/NYOnFarmResearchPartnership>

There is great power from research information when field data are generated through well designed, repeated and widely implemented trials, with proper data collection and statistically valid analyses.

Consider being an on-farm research partner!

[Relevant Questions and Sound Science for Agricultural Profitability and Protection of the Environment](http://nmsp.cals.cornell.edu/NYOnFarmResearchPartnership)

For further information or questions:

On-Farm Research Partnership

c/o Quirine M. Ketterings

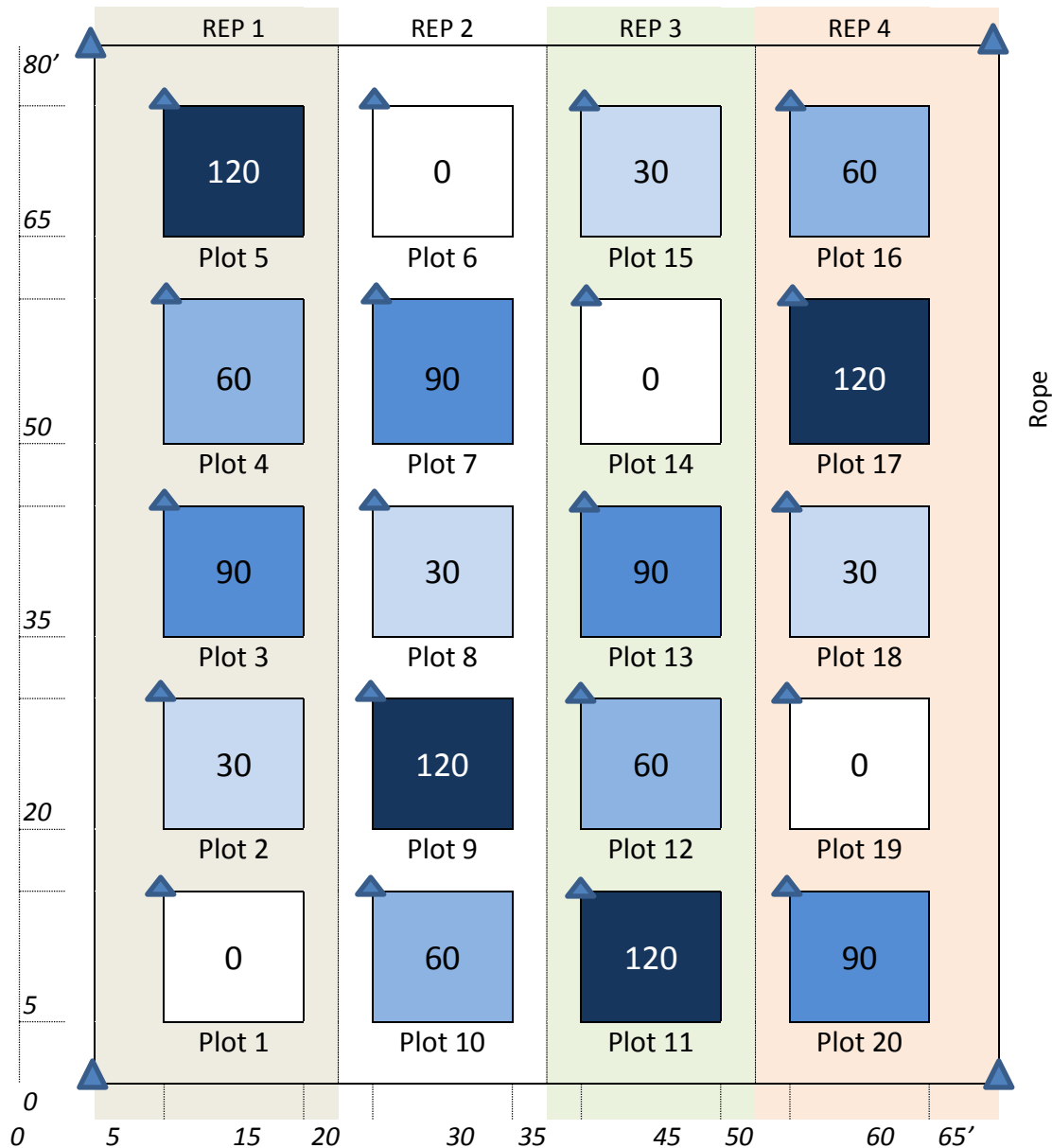
323 Morrison Hall, Cornell University, Ithaca, NY 14853

<http://nmsp.cals.cornell.edu/NYOnFarmResearchPartnership>

Email: [qmk2@cornell.edu](mailto:qmk2@cornell.edu)

# Nitrogen Rate Study for Winter Cereals

**Five N rates in four replications:** Each plot is 10 ft x 10 ft —80 flags per field, plus 24 corner poles (▲)



Mark the 4 corners of the entire trial: 0-65 ft and 0-80 ft with poles. Put flags on all the corners of each 10'x10' plot and a pole at the left upper corner of each 10x10 ft plot as shown on the diagram above.

**Width: Poles at 0 and 65 feet**

Plot corner flags at 5, 15, 20, 30, 35, 45, 50, 60 feet

**Length: Pole at 0 and 80 feet**

Plot corner flags at 5, 15, 20, 30, 35, 45, 50, 60, 65, and 75 feet

Nutrient Management Spear Program  
Nitrate Rate for Winter Cereals  
General Information Page  
2014

Collaborator:

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Name

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Address

\_\_\_\_\_

Home Phone

(    )

Cell Phone

(    )

Email

\_\_\_\_\_

Producer:

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Name

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Company

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Address

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