



**New York On-Farm Research Partnership
Project: Yield Monitor Evaluation Study 2013
Protocol and Directions-Alfalfa**



*This project is a collaboration between the Cornell Nutrient Management Spear Program and Agrinetix.
Questions? Contact Emmaline Long (eal93@cornell.edu) or Dave Russell (drussell@agrinetix.com)*

PART II: Moisture Sensor Evaluation

Introduction and Objectives:

Work over the past five years has shown that great improvements can be made in nutrient use efficiency when detailed farm, feed, and field records are kept. Such progress, monitored using annual Nutrient Mass Balance (NMB) assessments, can be made while maintaining or increasing milk production, illustrating the potential for a win-win situation for farm profitability and environmental protection. ***To achieve the desired nutrient reductions and increased efficiencies accurate farm and field yield records are essential.*** Accurate yield records are *the* major bottleneck on many farms for diagnosing causes of high nutrient balances, identifying solutions, designing rotations that feed the cows in a sustainable way, and confidently managing nutrients on a field by field basis. Because home-grown forage and grain production impact all aspects of the farm (economics, nutrient use, environmental footprint, etc.), without accurate yield records, it is nearly impossible to systematically measure progress at the field level, much less identify where the largest nutrient use efficiency gains can be made. Accurate yield records are needed, not just to evaluate the Cornell yield potential database, but also to help farms to quicker achieve nutrient reductions.

We are looking to partner with farms with an interest in collecting moisture data for forage monitors, and share yield data to generate a statewide database (as part of our Yield Database Project) to evaluate the accuracy of yield monitoring equipment.

Scope of Work:

We are hoping to document the accuracy of the John Deere Harvest Lab moisture sensor by comparing moisture values recorded in the field to those calculated in the lab via drying and weighing of plant material. Our goal is to have 10 participating farms per alfalfa cutting and sample a minimum of 25 loads over one day of harvest.

This project has three data collection components: (1) Chopper operator in the field, (2) NMSP representative at the bunk during harvest, and (3) Final data processing at Cornell. The responsibilities for each are listed below:

1. Chopper Operator in the field:

- Print “Yield Monitor Data Sheet: Part II” from the NMSP On-Farm Research Project Website:
 - <http://nmssp.cals.cornell.edu/NYOnFarmResearchPartnership/index.html>
 - Sheet has been set up to be 1 page when front-back printed
- Circle the cutting (1st, 2nd, 3rd, etc.) that the data sheet is being used for
- Fill out Farm Name, the date, and name of person collecting data
- For each truck load filled, indicate:
 - The load number will start with the first load to be sampled at the bunk and will correspond with the data sheet and labels being kept at the bunk.
 - Field ID: Can be unique farm ID for the field being harvested. This will help correspond back to Apex data if needed
 - The time the load is finished being filled. This will help with any confusion if loads are accidentally skipped, but are still being collected at the bunk.
 - Average moisture of the load. This is the most important value to note, as it is what we will be using to compare the lab calculated values to.
- **During the harvest, if any load accidentally gets skipped on the recording sheet, do not continue with the next load on the data sheet; put a line through the skipped load so the person at the bunk knows not to keep the samples from that particular load.**

2. NMSP Representative at the Bunk:

- For each harvest, someone from the NMSP will spend a day at the bunk to collect samples from a minimum of 25 loads.

- The graduate student in charge of the project, Emmaline, will most likely be the person. If more than one farm is harvesting on a given day, a research technician or summer intern will be the person at the bunk.
- One- 1 gallon bag will be sampled from each load dumped.
 - Sampling protocol: Take one large handful at a time walking around the dumped pile, for a total of 6 large handfuls.
 - If more than one person is available that day, five- 1 gallon samples will be taken per load to estimate within load variability of moisture.
- Bags will be labeled with load number (and sample number if relevant) and placed in a cooler.

3. Final processing at Cornell University

- Upon returning from the farm, plant material from each gallon bag will be weighed and recorded.
- Samples will be placed in an oven for approximately 3 days, and reweighed to get dry weight and moisture content at harvest.

If questions, contact:

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**Yield Monitor Study 2013
Data Sheet for Alfalfa Harvest**



Circle Cutting: First Second Third Fourth Fifth

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Farm Name: _____ Date: _____

Person collecting data: _____

Load Moisture Information:

Load Number	Field ID	Time of Load	Avg. Moisture of Load
			%
1		____:____	
2		____:____	
3		____:____	
4		____:____	
5		____:____	
6		____:____	
7		____:____	
8		____:____	
9		____:____	
10		____:____	
11		____:____	
12		____:____	
13		____:____	
14		____:____	
15		____:____	
16		____:____	
17		____:____	

Load Number	Field ID	Time of Load	Avg. Moisture of Load
			%
18		_____:	
19		_____:	
20		_____:	
21		_____:	
22		_____:	
23		_____:	
24		_____:	
25		_____:	
26		_____:	
27		_____:	
28		_____:	
29		_____:	
30		_____:	
31		_____:	
32		_____:	
33		_____:	
34		_____:	
35		_____:	
36		_____:	
37		_____:	
38		_____:	
39		_____:	
40		_____:	