

Field crop systems in Michigan

- ✓ Corn-soybean rotation dominate – complement each other
- ✓ Rotation influenced by price, equipment, new varieties (GMO)
- ✓ Continuous corn – yield decline
- ✓ Corn-soybean-winter wheat - longer rotations pose less risk
- ✓ Cover crops in the rotation

Field crop systems in Michigan

- ✓ Conservational tillage to reduced till to no-till practices
- ✓ Organic versus mineral soils
- ✓ Manure - synthetic fertilizer - slow release fertilizer - inhibitors

Nutrient management in cropping systems

- ✓ MSU recommendations for right rate, source, placement and timing will change somewhat as systems change

Examples:

- ✓ Continuous corn will require more N
- ✓ Organic soils will require less N than mineral soils
- ✓ Fertilizer and lime placement on the surface of no-till soils
- ✓ N credit for previous crop and manure

General Corn N Guidelines for MI

- ✓ Apply about 30 – 40 lb N at planting
- ✓ Apply the rest as a June sidedress application

Diagnostic tests – Fine tune the last 50 pounds of N

- ✓ PSNT - if manure has been applied or alfalfa history

Pre-sidedress Soil Nitrate Test (PSNT)

- Soils with high N mineralization potential (example: manure, organic products and alfalfa history)

Organic N \longrightarrow *Ammonium N* \longrightarrow *Nitrate N*

- Identify fields that may have little or no response to additional N fertilizer



Prep work PSNT

- Fields with a previous manure history or alfalfa
- Early planted fields



Prep work for PSNT

- No broadcast N (up to 30 lb N/a banded as starter)
- Sampling midway between rows at one foot depth
- Corn is about 12-inches
- Analyzed for nitrate-N in June

MSU Lab Report -PSNT

The critical level is 25 ppm nitrate N

> 25 ppm - no N fertilizer is recommended (*enough N now and rest of growing season*)

< 25 ppm - N fertilizer recommendation is adjusted

***** MICHIGAN STATE UNIVERSITY SOIL NITRATE TEST REPORT *****			
***** DEPARTMENT OF CROP AND SOIL SCIENCES *****			

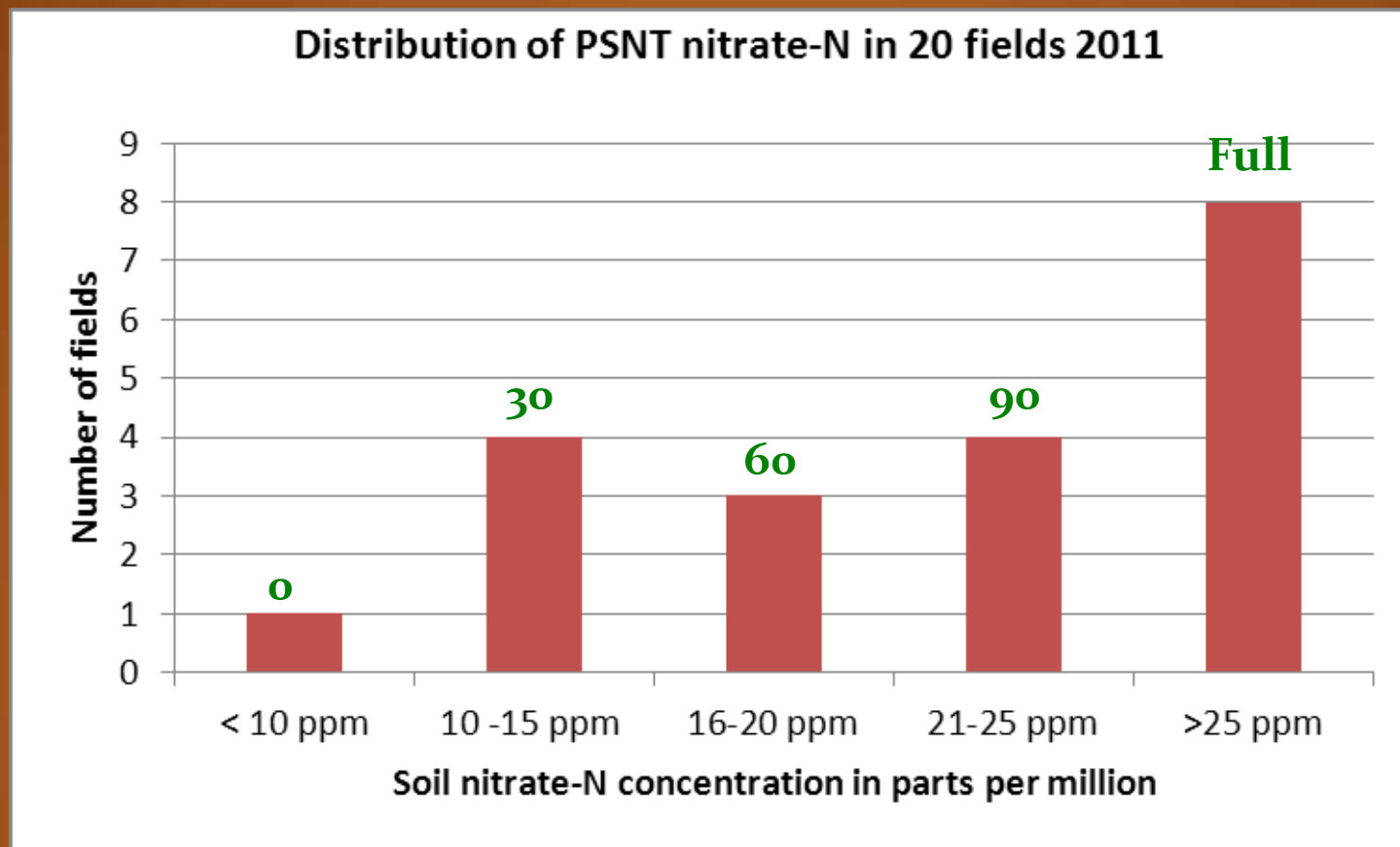
George Silva		DATE:	June 10, 2011
551 Courthouse Dr		LOCATION:	MSU
Charlotte		LAB TECHNICIAN:	JON DAHL
48813		COUNTY CODE:	Eaton
=====			
LAB NO. :	GS40	GS41	
=====			
FIELD ID. :	WW1	WW2	

CROP :	Corn	Corn	
@ YIELD GOAL :	180	180	
# SOIL TEST-ppm:	21	14	←
----- lb N per acre -----			
N REQUIREMENT :	170	170	

\$ N CREDIT :	90	30	

* ADJUSTED :			
NITROGEN :	80	140	←

Soil N credit (lb/A) from manure applied fields




Nitrate- N variability related to (a) type and amount of manure (dairy, swine, sheep, & poultry) (b) site-specific factors of soil and climate.

Nutrient Recommendations for Fruit Crops in Michigan

Pub. E 852 Fertilizing Fruit Crops 1996

Fertilizing Fruit Crops



Extension Bulletin E-852 • Major Revision June 1996

Eric Hanson
Department of Horticulture

Fruit trees and vines require the following mineral elements for satisfactory growth and production: nitrogen (N), phosphorus (P), potassium (K), magnesium (Mg), calcium (Ca), sulfur (S), boron (B), chlorine (Cl), copper (Cu), iron (Fe), manganese (Mn), molybdenum (Mo) and zinc (Zn). Fortunately, soils used for fruit production in Michigan supply adequate amounts of most of these nutrients, and most growers need apply only a few nutrients. Apply nutrients only if you know the crop needs them. Applications above amounts needed by the crop are an unnecessary expense and may result in reduced fruit quality, toxicities or deficiencies of other elements.

Fertilizers can pollute lakes, streams and groundwater if used improperly. Fertilizers can contribute nitrate to groundwater and P to lakes and streams. Proper fertilizer rates and application practices minimize the adverse effects of nutrient movement out of fruit plantings and reduce fertilization costs. Information on environmentally sound nutrient and manure management practices is available in the two Michigan Department of Agriculture publications listed at the end of this bulletin.

This bulletin is divided into four parts. *Part I* describes methods for monitoring the nutrient status of fruit crops and diagnosing shortages and

excesses. Fertilizer materials commonly used in fruit plantings are described in *Part II*. *Part III* outlines general fertilizer requirements of fruit crops and suggestions for correcting deficiencies. Fertilizer recommendations for blueberries are described separately in E-2011, "Highbush Blueberry Nutrition". Fertilizing fruit crops through trickle irrigation systems is discussed in *Part IV*.

PART I. Diagnosing and Avoiding Nutrient Deficiencies

Growers can determine fertilizer needs and diagnose nutritional problems by observing visual symptoms and using soil tests and tissue analysis. Because each method has advantages and limitations, utilize all three on a regular basis.

Visual Symptoms

Nutrient deficiencies or excesses usually cause symptoms that are fairly indicative of problems with specific nutrients. If you are familiar with typical symptoms, you can diagnose some nutrient dis-

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Nutrient management in fruit crops

- Plant tissue analysis is the most reliable tool for nutrient management in established orchards
- Roots reach depths below the soil probe
- Optimal nutrient concentrations for leaf and petiole have been established
- Soil tests - Pre-plant fertilizer applications determine soil pH every three years or so



Nutrient management in fruit crops

- Tissue analysis in 2-5 years
- MSU soil testing lab offers the service



