Recordkeeping System for Crop Production – Individual Field File
Cooperative Extension Service
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Individual Field File

This is one component of a paper Recordkeeping System for Crop Production. The total system includes Annual Record Books (E-2341, pocket-size and E-2342, full-size), Field File Folders (E-2343), Manure Management Sheets (E-2344, 4 sheets), and Enhanced Recordkeeping Sheets (E-2345, 3 sheets). The MSU bulletin, "Recordkeeping System for Crop Production," (E-2340) explains the use of the system.

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New 3:92 500 SL-LB, Price $6.00 For sale only. FILE 17:21 (Farm Management)

Table 1. Historic Soil Test Summary

Date of Soil Test Report	Name of Soil Testing Laboratory	Sample ID	pH	Lime Index	Amount of Nutrients (lb/acre) *				Lime Recommendation			Micronutrients, sulfur, or organic matter **		
					P	K	Ca	Mg	Rate (tons/acre)	Dolomitic? Yes	Dolomitic? No			

* If your soil test laboratory reports soil nutrient concentrations in ppm, convert to lb/acre by multiplying the values by 2, i.e., ppm x 2 = lb/acre. If the test results are given in lb/acre of P_2O_5 and K_2O, convert to P and K by: lb P_2O_5 ÷ 2.3 = lb P and lb K_2O ÷ 1.2 = lb K.

** Generally soil tests for micronutrients (B, Cu, Fe, Mn, Mo, Zn), sulfur(S), or organic matter, are <u>not routinely recommended</u> in Michigan. If you are testing for organic matter or any of these nutrients, label one of these columns and use them to record the soil test results.

Table 2. Nitrogen Credits (lb/acre) for Nutrient Planning

Importance of Nitrogen Management and the PSNT

Sources of nitrogen (N) for crop growth (i.e., fertilizers, manure, legume N fixation, etc.) should be managed so that additions of N do not greatly exceed crop needs. This can be done by following MSU fertilizer recommendations and by giving appropriate N credits for legumes, manures and/or for other residual N remaining in the soil from a previous growing season.

Without proper N management, the risk of losing nitrate N from the soil-plant system by leaching is increased. Excess additions of N may contaminate groundwater. If that groundwater is used as a source of drinking water and the nitrate concentration is greater than the U.S. Public Health Service standard of 10 mg N/l (i.e., 10 ppm), then the water may not be safe for drinking.

A new soil test, called the pre-sidedress nitrate test (PSNT), can help producers evaluate the amount of nitrate N present in their soil. This soil test can measure residual nitrate N left in the soil profile from the previous growing season. It can also measure nitrate N that was recently mineralized from N present in organic matter and organic materials in the soil.

These quantities of nitrate N are readily available for crops to use and should be credited against the total N needed by the crop to be grown. To provide good results, soil samples for the PSNT should be taken in June, after the soil has warmed-up (>50 °F), and within two weeks of the time when additional N could be sidedressed.

The PSNT has its greatest use (at the present time) for adjusting fertilizer N additions at sidedress time for corn grain, corn silage, seed corn, and sugar beets. Farmers can benefit from the use of the PSNT for: fields where corn or sugar beets are to be grown, crops following legumes, manured fields, fields heavily fertilized with N the previous year, and fields with medium or fine textured soils.

Contact your county Cooperative Extension Service office for current recommendations in using the PSNT or other tests for managing N.

Directions for Using Table 2

- If the PSNT is used, the N credit recommended by this test can be substituted for legume and/or manure N credits in Table 2 (to the right). Place the PSNT credit directly in the "N Credit" column in Table 3.
- If the PSNT is not used, determine the proper credits for a previous legume and/or manure application(s) and record these credits in Table 2 (to the right). Total these credits and place the value in the "N Credit" column in Table 3.

Year	Previous Legume*	Manure**

* Refer to the table "Suggested Nitrogen Credit for the Previous Crop" to obtain the proper value.

** Repeated applications of manure result in greater quantities of mineralized N being available for crop growth. Refer to MSU-CES Bulletin WQ12, "Livestock Manure Management", for guidance on estimating these N credits.

Suggested Nitrogen Credit for the Previous Crop	
Previous Crop	Nitrogen Credit (lb N/A)
Alfalfa	
100 % stand	100
80 % stand	90
60 % stand	75
40 % stand	60
20 % stand	50
Clovers and Birdsfoot Trefoil	
100 % stand	60
80 % stand	55
60 % stand	50
40 % stand	40
20 % stand	35
Soybeans	30 *
All other crops	0

* Take credit only for corn grain, corn silage, and seed corn. For all other crops take no credit.

Source: MSU-CES Bulletin E-550A and MSUFR (a computer program).

Table 3. Nutrient Planning

Year	Crop to be grown	Expected Yield (per acre)	Fertilizer Recommendations* (lb/acre)			N Credit** (lb/acre)	Manure Nutrients Applied † (lb/acre)			Additional Fertilizer Nutrients Needed by the Crop (lb/acre) ‡		
			N	P_2O_5	K_2O		Avail. N	P_2O_5	K_2O	N	P_2O_5	K_2O

* The quantities of nutrients needed for crop growth (i.e., the "Fertilizer Recommendations") should be based on soil test information, the crop to be grown, and a realistic yield goal, i.e., the "Expected Yield". These recommendations can be obtained from the soil fertility test report, MSU-CES Bulletins E-550A and E-550B, or MSUFR (a computer program).

** Nitrogen recommendations can be reduced by the amount of estimated N credits (Table 2) or by the N credit determined by using the pre-sidedress nitrate soil test (PSNT). Record the amount of N credit here and reduce the recommended N rate by this amount.

† The amount of "Manure Nutrients Applied" are calculated by dividing the "Total Manure Nutrients Applied" (from **Manure Management Sheet #4**) by the number of acres in the field.

‡ If manure was applied to the field, subtract the amount of nutrients added(i.e., "Manure Nutrients Applied") from the "Fertilizer Recommendations" to calculate the additional amount of fertilizer nutrients needed. If the N credit for a legume and/or previous manure applications have been determined (Table 2), the recommended N rate can be reduced by the amount of this credit. If a PSNT is done, then this credit should be used in place of manure and legume N credits. If there are no "N credits" or no manure was applied, then the amount of "Additional Fertilizer Nutrients Needed" will be the same as the "Fertilizer Recommendations".

Table 4. Pesticide Use Information

Date	Crop	Chemical Applied (Trade Name and Formulation)	Rate per Acre	Method of Application	Target Pest *	Name of Applicator	Notes **

* i.e., kind of weed, insect, nematode or disease

** "Notes" could include information such as weather, wind conditions, crop stage, pest stage, etc.

Nutrient Removal by Several Michigan Field Crops

Crop		Units	lb / unit of yield		
			N	P_2O_5	K_2O
Alfalfa	hay	ton	45	10	45
	haylage	ton	14	3.2	12
Barley	grain	bu (48 lb)	0.88	0.38	0.25
	straw	ton	13	3.2	52
Birdsfoot Trefoil	hay	ton	48	12	42
Bromegrass	hay	ton	33	13	51
Canola	grain	bu (60 lb)	1.9	0.91	0.46
	straw	ton	15	5.3	25
Clover-grass	hay	ton	41	13	39
Corn	grain	bu (56 lb)	0.90	0.35	0.27
	hi. moist. grain	ton	26	12	6.5
	stover	ton	22	8.2	32
	silage	ton	9.4	3.6	7.8
Dry Edible Beans	seed	cwt	3.6	1.2	1.6
Oats	grain	bu (32 lb)	0.62	0.25	0.19
	straw	ton	13	2.8	57
Orchardgrass	hay	ton	50	17	62
Potatoes	tubers	cwt	0.33	0.13	0.63
Red Clover	hay	ton	40	10	40
Rye	grain	bu (56 lb)	1.1	0.41	0.31
	straw	ton	8.6	3.7	21
Sorghum-sudangrass	hay	ton	40	15	58
	haylage	ton	12	4.6	18
Soybeans	seed	bu (60 lb)	3.8	0.88	1.4
Sugar Beets	roots	ton	4.0	1.3	3.3
Timothy	hay	ton	38	14	62
Wheat	grain	bu (60 lb)	1.2	0.62	0.38
	straw	ton	13	3.3	23

Reprinted from E-550A, "Fertilizer Recommendations for Field Crops in Michigan", Cooperative Extension Service, MSU, 1992.

Nutrient Removal by Several Michigan Vegetable Crops

Crop	Unit	lb / cwt		
		N	P_2O_5	K_2O
Asparagus	cwt	0.67	0.20	0.50
Beans, snap	cwt	1.2	0.12	0.55
Broccoli	cwt	0.20	0.05	0.55
Cabbage	cwt	0.35	0.08	0.35
Carrots	cwt	0.17	0.09	0.34
Cauliflower	cwt	0.33	0.13	0.33
Celery	cwt	0.25	0.10	0.80
Cucumbers	cwt	0.10	0.06	0.18
Lettuce	cwt	0.24	0.10	0.45
Muskmelon	cwt	0.42	0.10	0.55
Onions	cwt	0.25	0.13	0.24
Peas, shelled	cwt	1.0	0.23	0.50
Peppers	cwt	0.20	0.07	0.28
Pumpkins	cwt	0.20	0.06	0.34
Squash	cwt	0.18	0.08	0.33
Sweet Corn	cwt	0.42	0.14	0.28
Tomatoes	cwt	0.20	0.04	0.35

Reprinted from E-550B, "Fertilizer Recommendations for Vegetable Crops in Michigan", Cooperative Extension Service, MSU, 1992

Nutrient Removal by Several Michigan Fruit Crops

Crop	Unit	lb / cwt		
		N	P_2O_5	K_2O
Apples	cwt	0.03	0.016	0.14
Blueberries	cwt	0.11	0.023	0.11
Cherries - sweet	cwt	0.19	0.044	0.27
Cherries - tart	cwt	0.16	0.034	0.21
Grapes	cwt	0.10	0.023	0.23
Peaches	cwt	0.11	0.028	0.24
Pears	cwt	0.06	0.025	0.15
Plums	cwt	0.13	0.023	0.21
Strawberries	cwt	0.10	0.044	0.20

Compiled from: "Composition of Foods: Fruits and Fruit Juices", USDA Agriculture Handbook No 8-9, Revised 1982

Importance of Equipment Calibration

To apply the correct amount of fertilizers, pesticides, ag lime, and/or animal manures to your field, application equipment should be calibrated. For proper management of nutrients and pesticides, the amounts per acre applied should be known. This will ensure efficient utilization of these materials for crop production and minimal risk of environmental pollution.