UW-FARM
Field nutrient and Application Recommendation Manager

S.M. Combs and S.W. Lindsey

Soil and Plant Analysis Lab Dept Soil Science

UW-Madison

UW-FARM

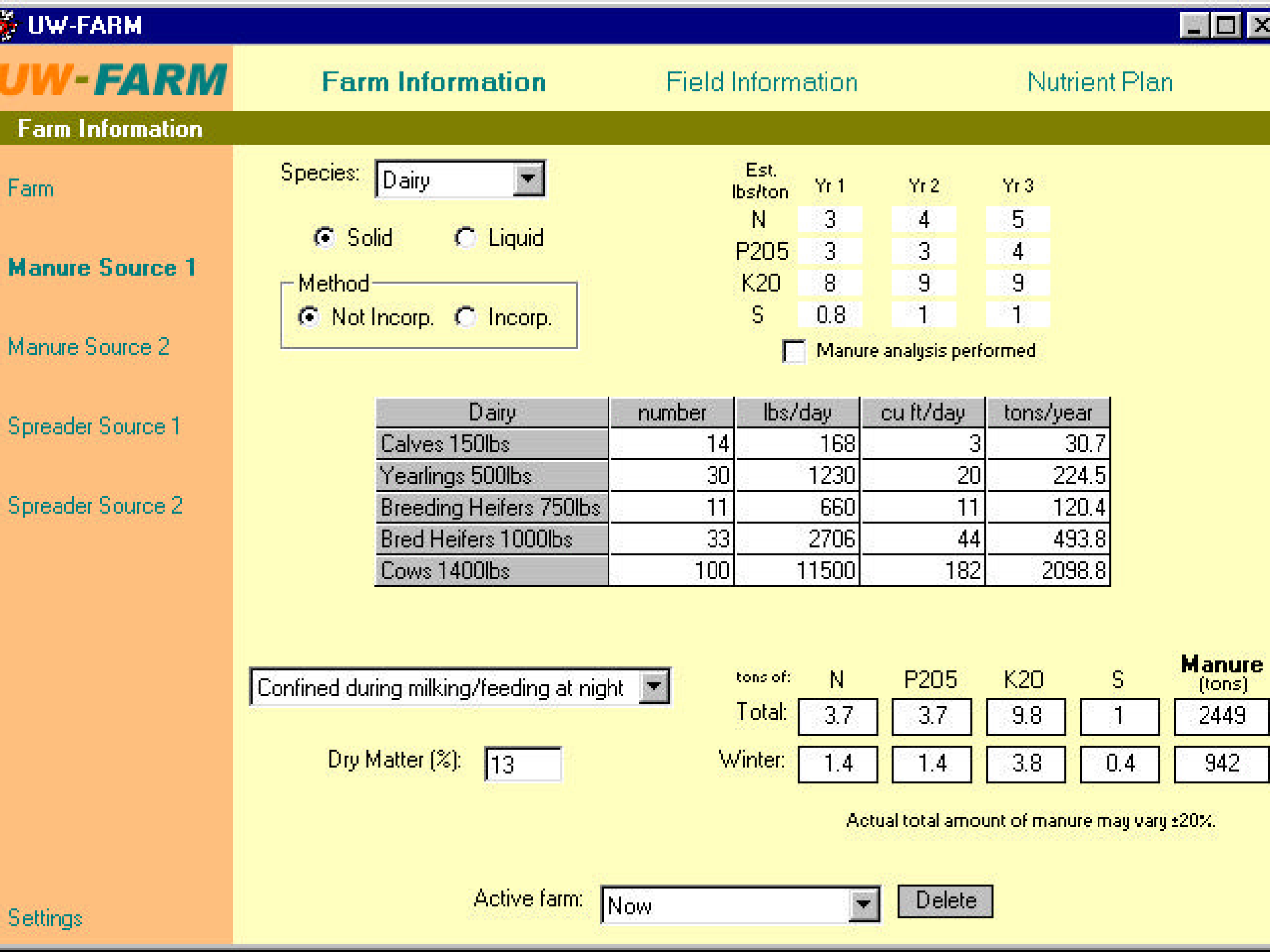
- Manage on-farm, purchased nutrients
  - Best management practices
- ‘what if….’
    - Expand herd, feed more corn silage, feed less dietary P
  - Determine outcomes
  - Assess farm management to meet current/anticipated constraints
    - Environmental, equipment, land acquisition…

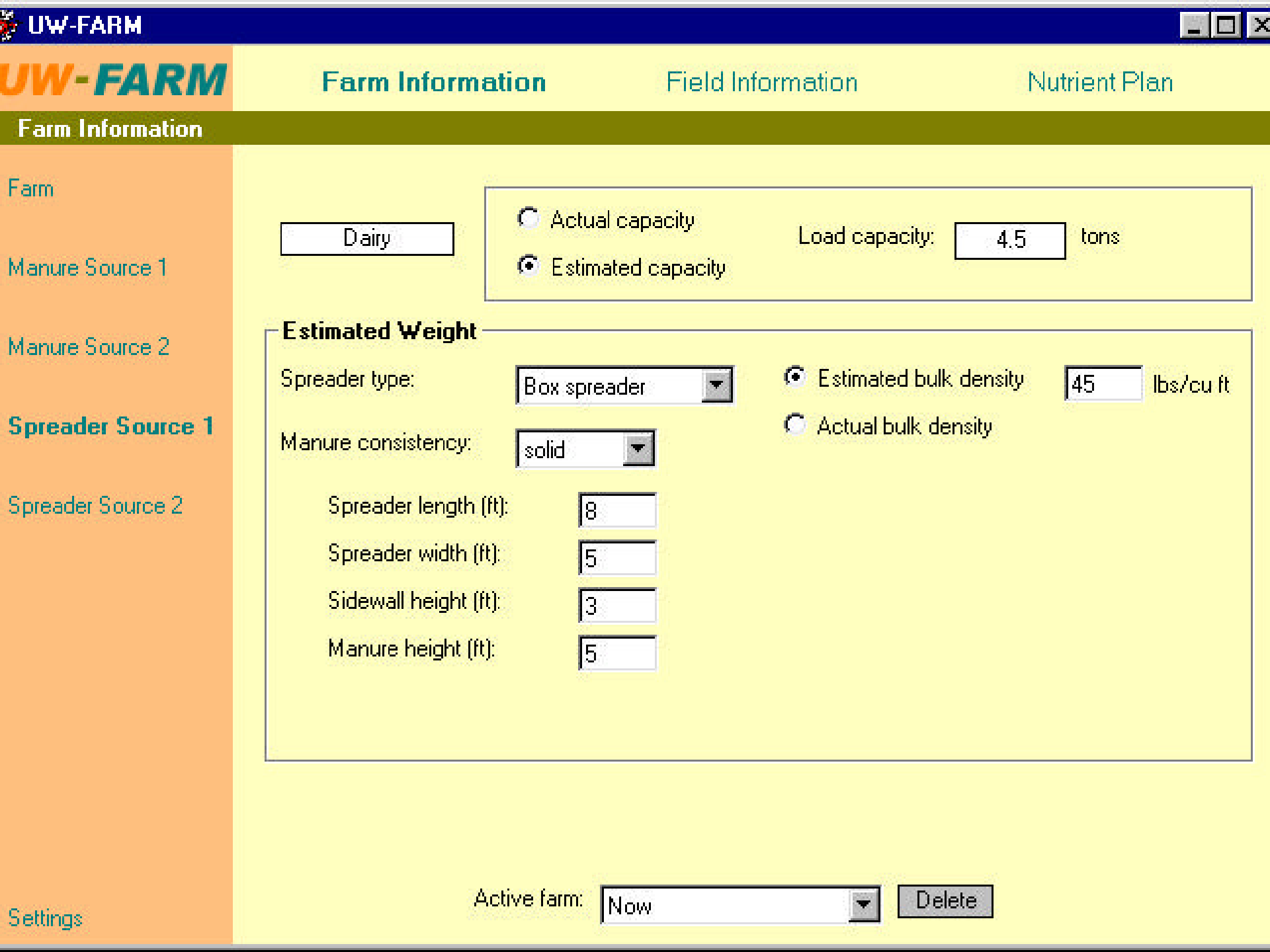
Program highlights

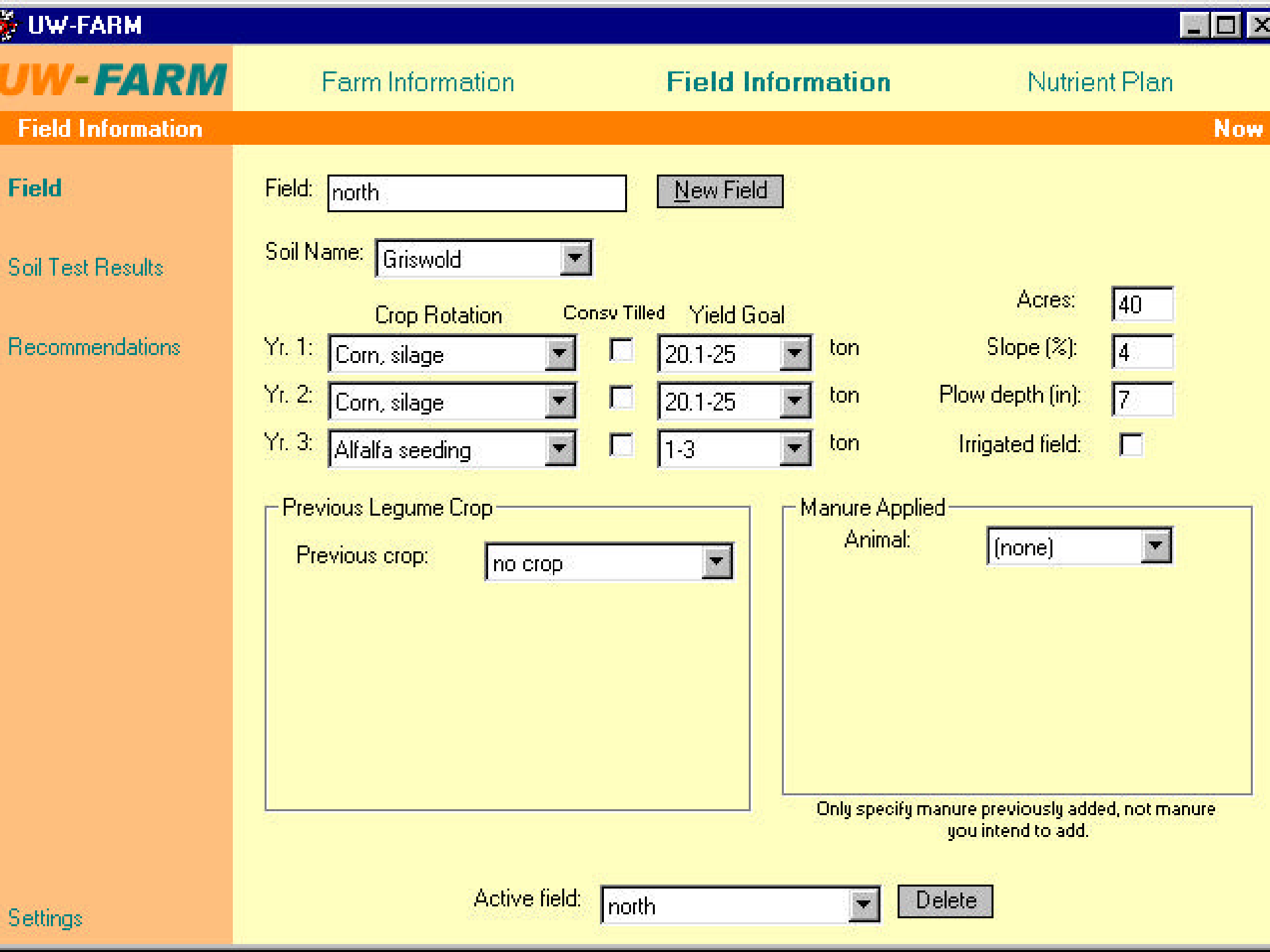
- Windows based
  - Field, animal management
- Soil test results/recommendations
- 2 manure sources, spreaders
- N or P based plan
- NRCS-590 alerts
- Manure, fertilizer application summaries
  - Speed for spreading
  - Combined fertilizer application rates

Current dairy operation

- 100 cows
  - 88 replacements
- 240 a cropland
  - 175 a alfalfa, 40 a corn silage
    - Need 10T forage/cow+replacement/yr
    - 75% alfalfa, 25% corn silage
  - Remaining 25 a as corn grain, pasture


UW-FARM
UW-FARM
Farm Information
Field Information
Nutrient Plan
Farm Information
Farm
Manure Source 1
Manure Source 2
Spreader Source 1
Spreader Source 2
Settings
Species:
Dairy
Solid
Liquid
Method
Not Incorp.
Incorp.
Est. lbs/ton
Yr 1
Yr 2
Yr 3
N
3
4
5
P2O5
3
3
4
K2O
8
9
9
S
0.8
1
1
Manure analysis performed
Dairy
number
lbs/day
cu ft/day
tons/year
Calves 150lbs
14
168
3
30.7
Yearlings 500lbs
30
1230
20
224.5
Breeding Heifers 750lbs
11
660
11
120.4
Bred Heifers 1000lbs
33
2706
44
493.8
Cows 1400lbs
100
11500
182
2098.8
Confined during milking/feeding at night
Dry Matter (%):
13
tons of:
N
P2O5
K2O
S
Manure (tons)
Total:
3.7
3.7
9.8
1
2449
Winter:
1.4
1.4
3.8
0.4
942
Actual total amount of manure may vary ±20%.
Active farm:
Now
Delete


UW-FARM
UW-FARM
Farm Information
Field Information
Nutrient Plan
Farm Information
Farm
Manure Source 1
Manure Source 2
Spreader Source 1
Spreader Source 2
Settings
Dairy
Actual capacity
Estimated capacity
Load capacity:
4.5
tons
Estimated Weight
Spreader type:
Box spreader
Manure consistency:
solid
Estimated bulk density
45
lbs/cu ft
Actual bulk density
Spreader length (ft):
8
Spreader width (ft):
5
Sidewall height (ft):
3
Manure height (ft):
5
Active farm:
Now
Delete


UW-FARM
UW-FARM
Farm Information
Field Information
Nutrient Plan
Field Information
Now
Field
Soil Test Results
Recommendations
Settings
Field: north
New Field
Soil Name: Griswold
Crop Rotation
Consv Tilled
Yield Goal
Yr. 1: Corn, silage
20.1-25
ton
Yr. 2: Corn, silage
20.1-25
ton
Yr. 3: Alfalfa seeding
1-3
ton
Acres: 40
Slope (%): 4
Plow depth (in): 7
Irrigated field:
Previous Legume Crop
Previous crop: no crop
Manure Applied
Animal: (none)
Only specify manure previously added, not manure you intend to add.
Active field: north
Delete

UW-FARM

UW-FARM

Farm Information | **Field Information** | Nutrient Plan

Field Information — **Now**

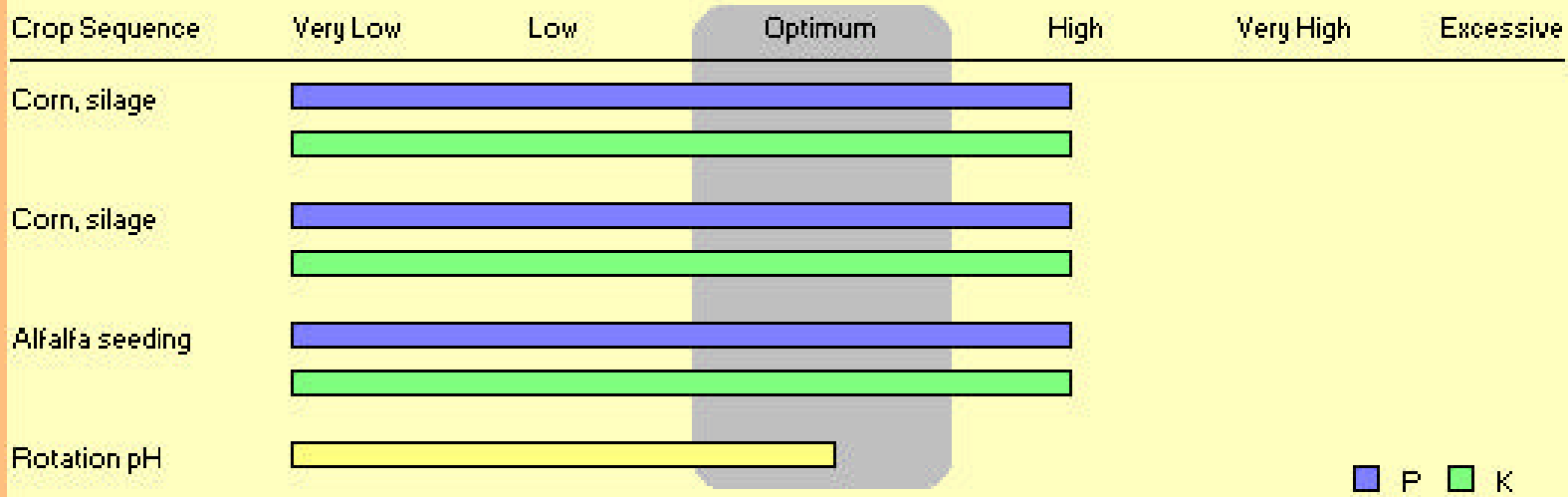
Field

Soil Test Results

Recommendations

Crop Sequence	Yield Goal	Crop Nutrient Need			Legume N	Fertilizer Credit			Nutrients to Apply		
		N	P2O5	K2O		N	P2O5	K2O	N	P2O5	K2O
Corn, silage	20.1-25 tons	160	40	70	0	0	0	0	160	40	70
Corn, silage	20.1-25 tons	160	40	70	0	0	0	0	160	40	70
Alfalfa seeding	1-3 tons	0	10	50	0	0	0	0	0	10	50

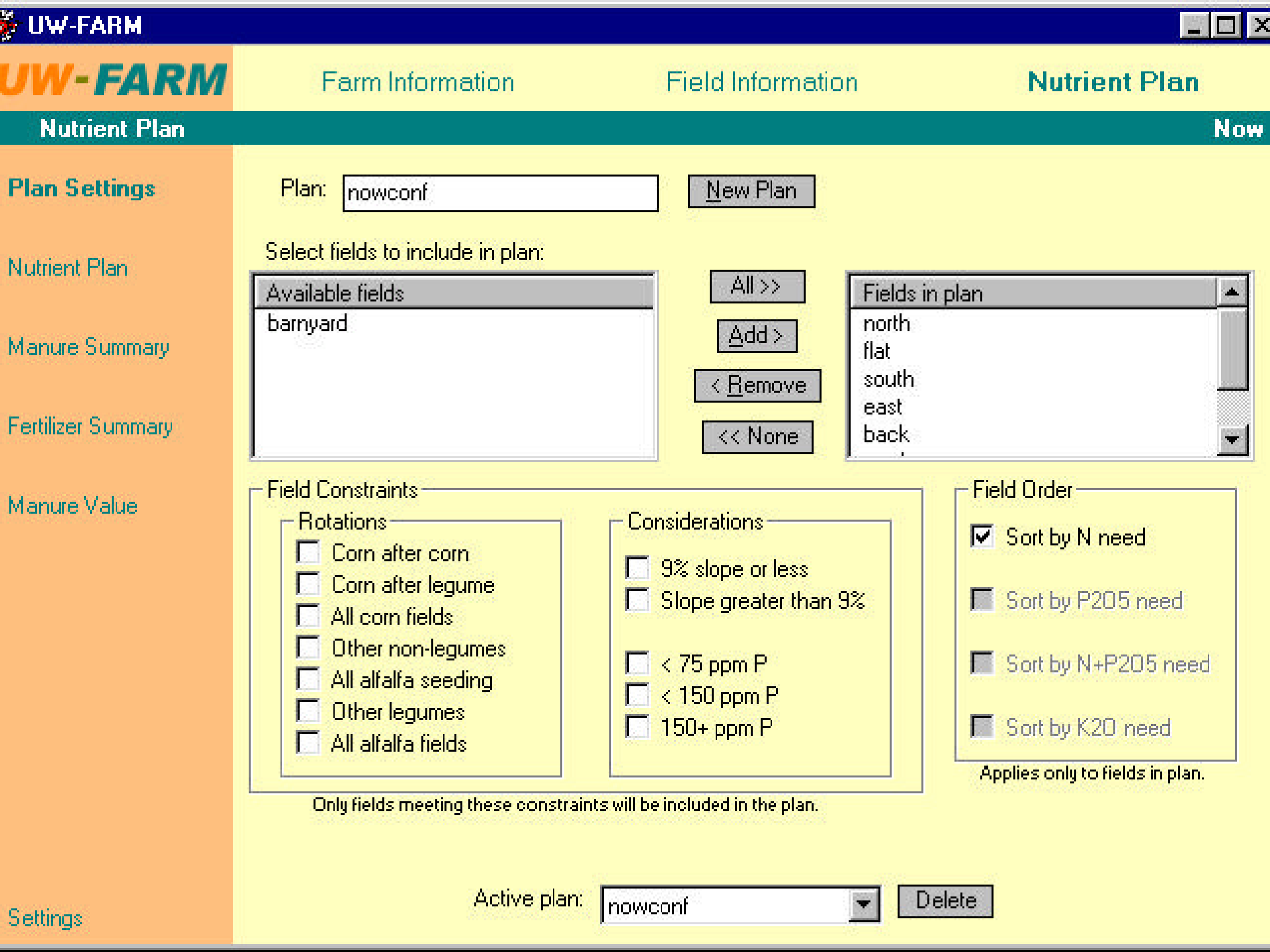
No lime application is required.

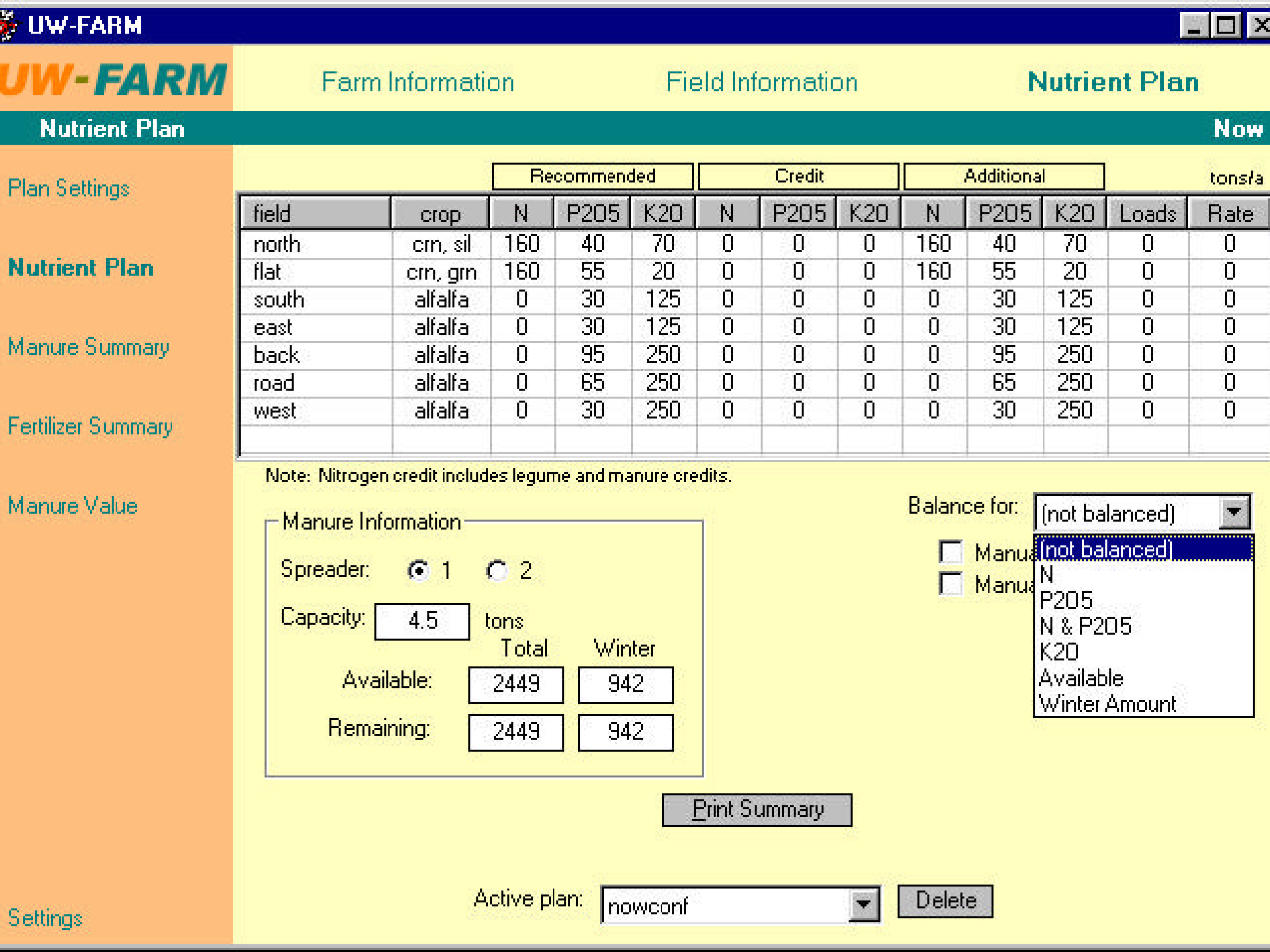


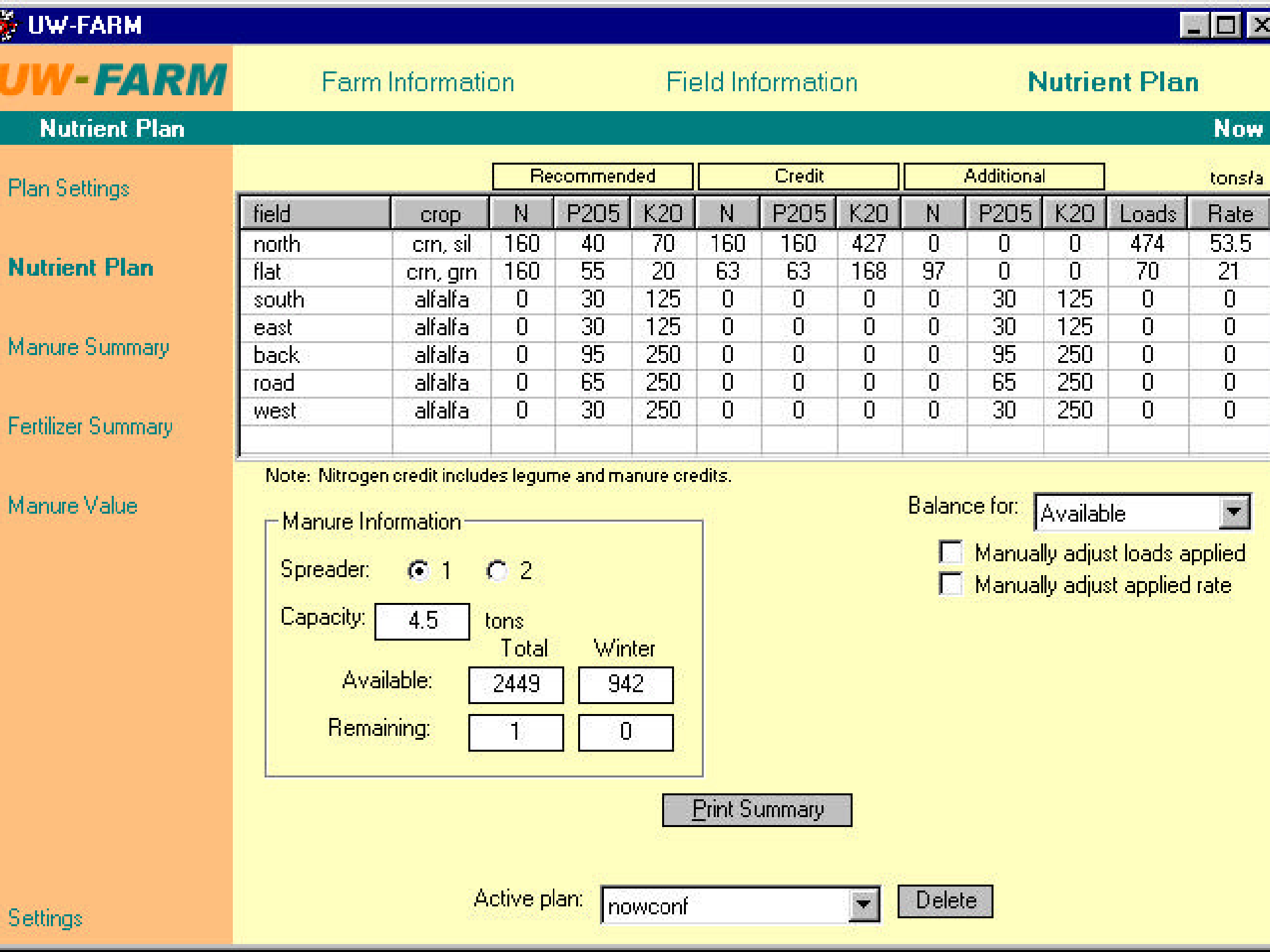
View Comments | View Adjusted Averages | Print Summary

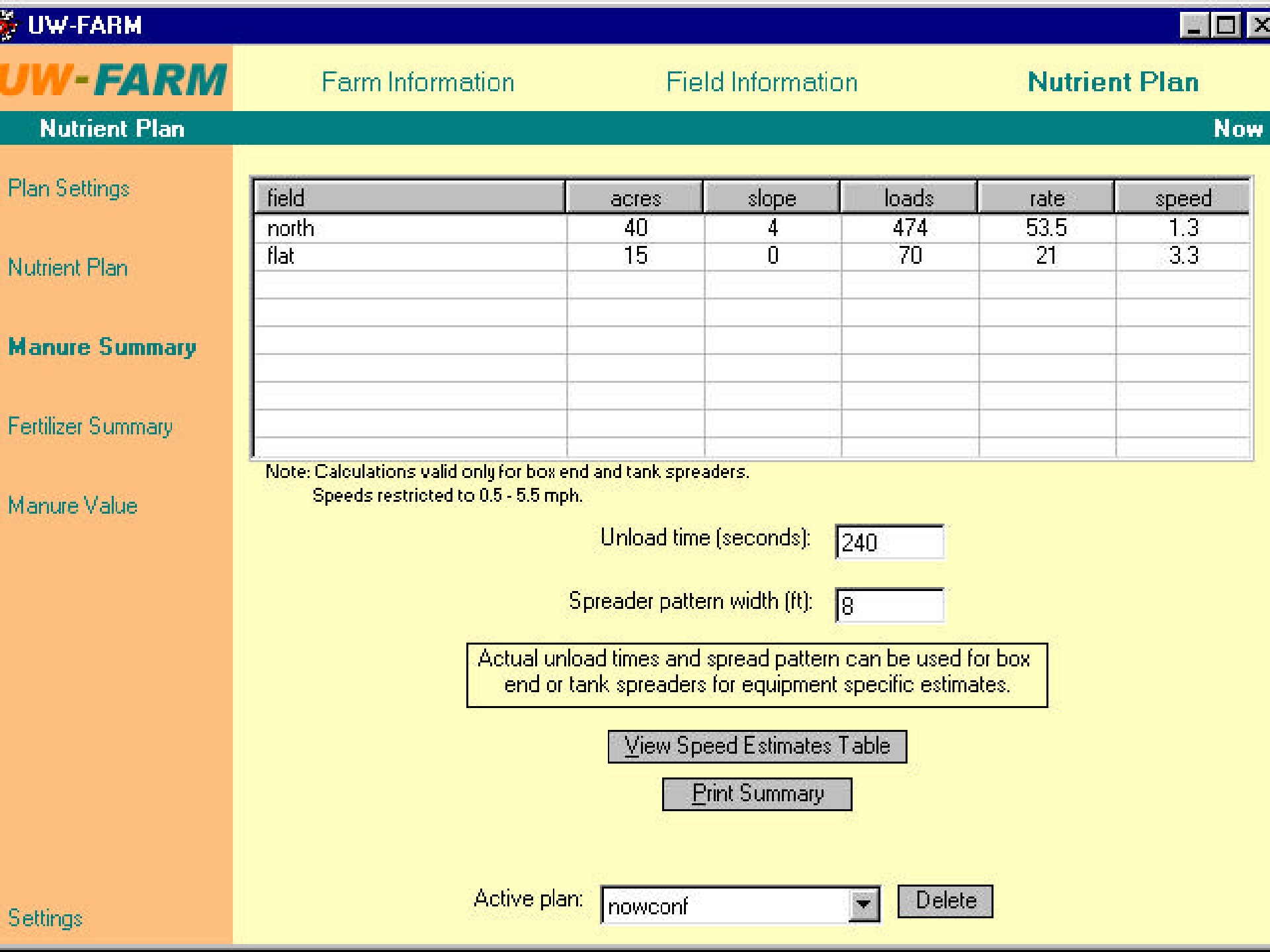
Active field: north | Delete

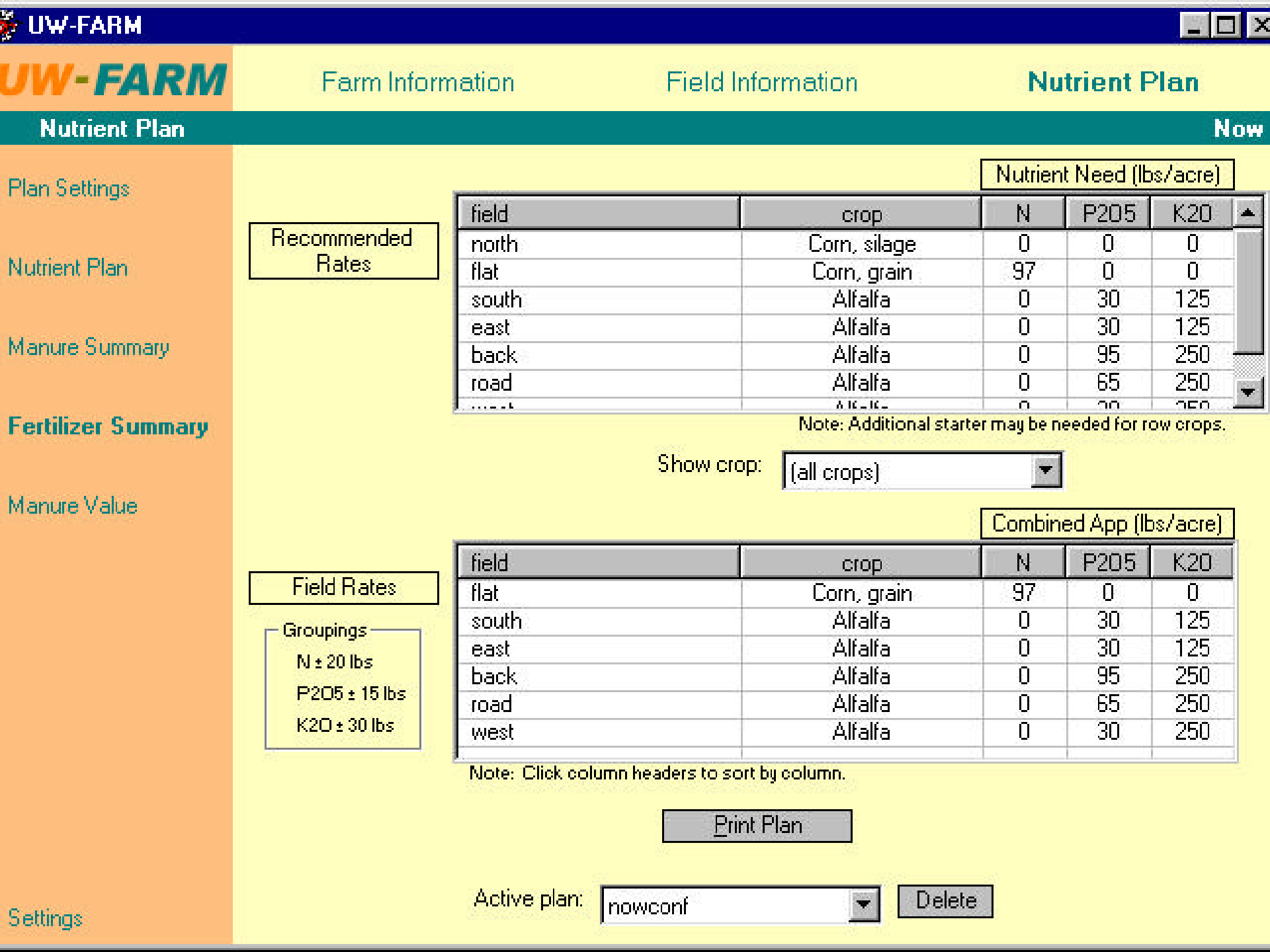
Settings


UW-FARM
UW-FARM
Farm Information
Field Information
Nutrient Plan
Nutrient Plan
Now
Plan Settings
Nutrient Plan
Manure Summary
Fertilizer Summary
Manure Value
Settings
Plan:
nowconf
New Plan
Select fields to include in plan:
Available fields
barnyard
All >>
Add >
< Remove
<< None
Fields in plan
north
flat
south
east
back
Field Constraints
Rotations
Corn after corn
Corn after legume
All corn fields
Other non-legumes
All alfalfa seeding
Other legumes
All alfalfa fields
Considerations
9% slope or less
Slope greater than 9%
< 75 ppm P
< 150 ppm P
150+ ppm P
Only fields meeting these constraints will be included in the plan.
Field Order
Sort by N need
Sort by P2O5 need
Sort by N+P2O5 need
Sort by K2O need
Applies only to fields in plan.
Active plan:
nowconf
Delete


UW-FARM
UW-FARM
Farm Information
Field Information
Nutrient Plan
Nutrient Plan
Now
Plan Settings
Nutrient Plan
Manure Summary
Fertilizer Summary
Manure Value
Settings
Recommended
Credit
Additional
tons/a
field crop N P205 K20 N P205 K20 N P205 K20 Loads Rate
north crn, sil 160 40 70 0 0 0 160 40 70 0 0
flat crn, grn 160 55 20 0 0 0 160 55 20 0 0
south alfalfa 0 30 125 0 0 0 0 30 125 0 0
east alfalfa 0 30 125 0 0 0 0 30 125 0 0
back alfalfa 0 95 250 0 0 0 0 95 250 0 0
road alfalfa 0 65 250 0 0 0 0 65 250 0 0
west alfalfa 0 30 250 0 0 0 0 30 250 0 0
Note: Nitrogen credit includes legume and manure credits.
Balance for:
(not balanced)
(not balanced)
N
P205
N & P205
K20
Available
Winter Amount
Manure Information
Spreader: 1 2
Capacity: 4.5 tons
Total Winter
Available: 2449 942
Remaining: 2449 942
Print Summary
Active plan: nowconf
Delete


UW-FARM
UW-FARM
Farm Information
Field Information
Nutrient Plan
Nutrient Plan
Now
Plan Settings
Nutrient Plan
Manure Summary
Fertilizer Summary
Manure Value
Settings
Recommended
Credit
Additional
tons/a
field crop N P205 K20 N P205 K20 N P205 K20 Loads Rate
north crn, sil 160 40 70 160 160 427 0 0 0 474 53.5
flat crn, grn 160 55 20 63 63 168 97 0 0 70 21
south alfalfa 0 30 125 0 0 0 0 30 125 0 0
east alfalfa 0 30 125 0 0 0 0 30 125 0 0
back alfalfa 0 95 250 0 0 0 0 95 250 0 0
road alfalfa 0 65 250 0 0 0 0 65 250 0 0
west alfalfa 0 30 250 0 0 0 0 30 250 0 0
Note: Nitrogen credit includes legume and manure credits.
Balance for:
Available
Manually adjust loads applied
Manually adjust applied rate
Manure Information
Spreader:
1
2
Capacity:
4.5
tons
Total
Winter
Available:
2449
942
Remaining:
1
0
Print Summary
Active plan:
nowconf
Delete


UW-FARM
UW-FARM
Farm Information
Field Information
Nutrient Plan
Nutrient Plan
Now
Plan Settings
Nutrient Plan
Manure Summary
Fertilizer Summary
Manure Value
Settings
field
acres
slope
loads
rate
speed
north
40
4
474
53.5
1.3
flat
15
0
70
21
3.3
Note: Calculations valid only for box end and tank spreaders.
Speeds restricted to 0.5 - 5.5 mph.
Unload time (seconds):
240
Spreader pattern width (ft):
8
Actual unload times and spread pattern can be used for box end or tank spreaders for equipment specific estimates.
View Speed Estimates Table
Print Summary
Active plan:
nowconf
Delete


UW-FARM
UW-FARM
Farm Information
Field Information
Nutrient Plan
Nutrient Plan
Now
Plan Settings
Nutrient Plan
Manure Summary
Fertilizer Summary
Manure Value
Settings
Nutrient Need (lbs/acre)
Recommended Rates
field
crop
N
P205
K20
north
Corn, silage
0
0
0
flat
Corn, grain
97
0
0
south
Alfalfa
0
30
125
east
Alfalfa
0
30
125
back
Alfalfa
0
95
250
road
Alfalfa
0
65
250
Note: Additional starter may be needed for row crops.
Show crop:
(all crops)
Combined App (lbs/acre)
Field Rates
Groupings
N ± 20 lbs
P2O5 ± 15 lbs
K2O ± 30 lbs
field
crop
N
P205
K20
flat
Corn, grain
97
0
0
south
Alfalfa
0
30
125
east
Alfalfa
0
30
125
back
Alfalfa
0
95
250
road
Alfalfa
0
65
250
west
Alfalfa
0
30
250
Note: Click column headers to sort by column.
Print Plan
Active plan:
nowconf
Delete

What if…..expand herd?

- 500 cows
  - plus 442 replacements
    - Manure =14976 T
    - 30 T available N @ 4 lbs/T
    - Acres corn = 375 @160 lbs/a
  - No replacements
    - Manure =10494 T
    - 21 T available N @ 4 lbs/T
    - Acres corn = 260 @160 lbs/a

What if….feed more corn silage?

- More DM from corn silage/a than alfalfa
  - If expand to 500 cows + replacements
    - 75% corn silage @ 20 T/a = 625 a
    - 25% alfalfa @ 5 T/a = 300 a
  - If no replacements on farm
    - Reduce forage needs/acres by 50%
    - Have 21 T available N, need 25 T
    - New alfalfa acres remain similar to current
- Increase acres for manure N

What if…..feed less dietary P?

- Reducing diet P to NRC guidelines has potential to reduce manure P by 25%
- No replacements
  - Feed ‘excess’ diet P
    - @ 3 lbs P_2O_5/T = 16 T crop available P_2O_5
  - Feed less diet P
    - @ 2 lbs P_2O_5/T = 10.5 T crop available P_2O_5
  - Current crop needs = 5.4 T P_2O_5
- Cropping strategy for P-based plan

UW-FARM

- ‘what if….’ allows producers to identify potential agronomic and regulatory impacts of modernization options
  - Meet current or anticipated constraints proactively
- Microsoft Windows beyond 3.x
- Internet Explorer 4.01 (SP2) installed
- http://uwlab.soils.wisc.edu
  - Download or request CD