Exhibit 1

The case study... compares conventional planting and management of corn with no-till planting and conservation management in a corn-hay rotation.

New York Case Study: Experiences with No-Till Corn Planting

Before (or current) condition	After (or option) condition	Impact
Corn 3, Hay 7	Corn 3, Hay 7	No impact
Soil loss--7.1 tons/acre/year	Soil loss--4.1 tons/acre/year	Reduced loss--3 tons/acre/year
Soil loss caused offsite damage	No-till kept soil on field	No-till eliminated runoff damage to newly seeded fields or haylots
Time to plow, pick rock, fit field, spray, plant in sod: 33-37 hours	Time to spray,plant: 9-11 hours	22-28 hours saved; use for dairy management, for leisure time
Time to plow, pick rock, fit field, spray, plant in corn: 25-27 hrs	Time to spray, plant: 7 hours	18-20 hours saved; use for dairy management, for leisure time
Fertilizer--400 lb/acre 15-15-15, 8-10 tons/acre manure	Fertilizer--400lb/acre 15-15-15, 8-10 tons/acre manure	No impact
Herbicides on sod--4 quarts Atrazine	Herbicides on sod--1 quart Paraquat + Surfactant, 5 lb Atrazine	Higher costs; more spray trips; higher level of chemical knowledge required
Herbicides on corn after corn--2 1/2 to 3 quarts Atrazine, 2 quarts Lasso	Herbicides on corn after corn--2 1/2 to 3 quarts Atrazine	No impact
More flexibility in timing	Time of sprays more critical	Better time management needed; optimum weed control difficult with custom spraying
Field plowed and fitted with 90 hp diesel tractor	Planting, spraying with 80 hp diesel tractor	Cheaper tractor to buy, run, and maintain
Large tractor needed for tillage	Large tractor still needed-- occasional plowing, blowers, etc.	Equipment not worked as hard; it lasts longer
More tractor fuel used	Less tractor fuel used	Dollar savings
Conventional or no-till planter would work	No-till planter needed	Higher cost; but more planting options: convent'l, reduced, no-till
Corn yield--100-120 bushels/acre	Corn yield-- no noticeable difference	No impact
Corn shows stress signs during drought	Corn holds up longer before showing signs of stress	May offset decreased yield due to seed mortality
Tractor can get stuck in fall; field is left rough in "wet" fall	Better traction in fall; leaves fewer ruts	Time savings in fall (not stuck); time savings in spring (preparing field)
Some soil compacting noted	Reduced soil compacting	Better root development

Mention of commercial names does not constitute USDA endorsement.

Exhibit 2

CASE STUDY - CHASE COUNTY, NEBRASKA

Conservation Information Sheet

RANGELAND - - BENCHMARK

RESOURCE SETTING: Three soil associations occur in this setting. The Valent-Tassel Association, with slopes of 3 to 30 percent, is present north of the creek. The range site is 70 percent sands and 30 percent shallow limy. The Wann Association, slopes of O to 3 percent, is present along the creek. The range site is subirrigated. South of the creek is the Colby association, with 3 to 60 percent slopes. The range site is limy upland. Average precipitation is 19 inches. May and June are the months of highest rainfall. Approximately 31 inches of snowfall occurs during the winter. Plant cover consists of warm season mixed grass prairie. Animal resources consist of domestic livestock (yearling cattle) and wildlife (pheasant, prairie chicken, waterfowl, and deer).

MANAGEMENT SYSTEM: Leased yearling cattle operation on 600 acres of rangeland. No brush control. Livestock water is provided by a multiple use reservoir and creek. Livestock have free access to multiple use reservoir and riparian area along the creek. Travel distance to water may exceed three fourths of a mile over rough terrain. Cattle graze freely over the entire pasture throughout the winter and during a portion of the summer. The cattle are fed in the same area during the winter. Overuse of the rangeland is causing an increase in sand sagebrush and less palatable species. Ecological range condition in the limy upland and sandy range sites is fair with a downward trend.

ACTIONS	EFFECTS
No action taken to improve plant vigor, composition, kinds or cover	Generally overgrazed
Generally overstocked for resource conditions	Low plant vigor
No brush control	Poor grazing pattern caused by water distribution problem
	Sand sagebrush increasing
	Excessive runoff
	Plants do not meet the forage needs of the land user
	Small gullies associated with cattle trails and drainage ways
	20 pounds of beef produced per acre @ $0.90/1b = $18 gross return per acre
	Shortage of wildlife cover (pheasant, prairie chicken, and deer)

CASE STUDY - CHASE COUNTY, NEBRASKA

Conservation Information Sheet

RANGELAND - - OPTION NO. 1

RESOURCE SETTING: Same as benchmark condition.

MANAGEMENT SYSTEM: Leased yearling cattle operation on 600 acres of rangeland with a resource management system (RMS) installed consisting of the practices in the ACTIONS section. Livestock have limited access to multiple use reservoir and riparian area along the creek. Travel distance to water one half mile over rough terrain. Three pasture rotation grazing. Ecological range condition in the limy upland and sandy range sites is fair with an upward trend.

A 12% interest rate was used in the analysis and no cost sharing was involved. Costs are on a per acre basis and installation costs are rounded to the nearest dollar.

ACTIONS

556 Planned grazing system ($1,200 or $2 per acre)
528 Proper grazing use
642 Well (200' @ $6 = $1,200 or $2 per acre)
516 Pipeline (300' @ $1.10 = $330 or $0.60 per acre)
614 Tank (2-each 3,000 gallon capacity, @ $0.09 per gal. = $540 or $0.90 per acre)
382 Fencing (permanent elect. 7,500' @ $0.34 = $2,550 or $4 per acre)
314 Brush mgt, chemical (treat 60 acres @ $7.20 = $432 or $0.72 per acre)

EFFECTS

COST	LIFE	% O&M	ANN. $
$ 2	10 YR	5	.50
-	-		-
2	20	1	.30
1	20	1	.10
1	25	1	.10
4	10	5	.90
1	5	3	.30
$11			$2.20

Up front installation cost of $6,300 or $11.00 per acre. Average annual cost of $2.20 per acre

Small gully sidewalls are stable and there is no head cutting

Infiltration improved and surface runoff reduced

Plants provide adequate growth and vigor for intended use

Plant community is in balance

Adequate cover for pheasant, prairie chicken, and deer

30 pounds of beef produced per acre at $0.90/lb = $27 gross return

CASE STUDY - CHASE COUNTY, NEBRASKA

Conservation Information Sheet

RANGELAND - - IMPACTS

COMPARING:

BENCHMARK -- Overstocked yearling cattle operation on 600 acres of rangeland

OPTION 1 -- Yearling cattle operation with a resource management system (RMS) installed consisting of the following practices: 556 Planned grazing system, 528 Proper grazing use, 642 Well, 516 Pipeline, 614 Tank, 382 Fencing, and 314 Brush management (chemical).

PLUSES

Small gully sidewalls are stable and there is no head cutting

Plants provide adequate growth and vigor for intended use

Infiltration improved and surface runoff reduced

Adequate cover for pheasant, prairie chicken, and deer

Increase pounds of beef sold by 10 pounds per acre

Increase carrying capacity by 15 percent

Increase annual gross return by $9 per acre

Increase net return by $6.80 per acre

MINUSES

Higher level of management required

Up front installation cost of $6,300 or $11 per acre. Average annual cost of $2.20 per acre

(Average annual costs are the annual payments needed to payoff the principal and interest of a one time cost such as a practice installation cost)

Exhibit 3

U.S. Department of Agriculture
Soil Conservation Service

Conservation Treatment Information

TECHNICAL GUIDE
SECTION V

Field Office: Lima Field Office

Conservation Treatment: Grassed waterway, Conservation Crop. Seq. (C-Sb-W), Cons. Tillage (Nt corn & beans, MT wheat) Pest Management, Nutrient Management (meets RMS & criteria).

Resource Setting:
Blount-Morley soils, moderately sloping.

Resource Problems Before Treatment:
Excessive sheet and rill erosion, gullies, nutrients & pesticides in runoff.

Actions
(Kinds, Amounts, and Timing)

NUTRIENT MANAGEMENT
- See actions by crop below

PEST MANAGEMENT
- Scout for economic pest levels
- Select alternate control measures
- Use less mobile chemicals

GRASSED WATERWAY
- Construct and seed to smooth bromegrass

NO-TILL CORN IN WHEAT RESIDUE
- Chop stubble (August)
- Soil Test in March or April
- Apply P&K 1 wk. prior to planting
- Plant and spray
  - Bladex
  - Gramoxone
  - Isotox seed treater
- Knife in anhydrous ammonia
- Spray broadleaf weeds
  - Banvel
  - 2,4-D

NO-TILL BEANS IN CORN STALKS
- Spray preplant herbicides
- Spot spray for thistle, w/ Roundup
- Plant & Spray Turbo & Gramoxone double back for 15" rows
- Spot spray quackgrass w/Fusilade & thistles w/Basagran as needed

MULCH-TILL WHEAT IN BEAN STUBBLE
- Disk bean stubble
- Drill wheat
- Apply nitrogen in late Feb.

Effects
(Effects of Conservation Treatment)

RMS Installed
- Soil Loss 3 t/ac
- Nutrients better utilized
- Nutrient pollution reduced
- Less mobile herbicides used
- Scouting for pests needed
- Waterway eliminated gully
- Loose 1/2 acre of cropland
- 1/2 acre wildlife habitat (waterway)
- Residue improves tilth, increases runoff
- Sedimentation potential reduced
- Machinery:
  - 75 Hp tractor
  - No-till planter
  - Chopper
- Chemicals:

Corn:	Gramoxone	2 pts/ac.
	Bladex	3 qt./ac.
	Banvel	1/4 pt./ac.
	2,4-D	1/4 pt./ac.
Beans:	Gramoxone	1 pt.ac.
	Turbo	1 qt./ac.
Wheat:	none	

- Fertilizer

Corn:	N 40 lb.-starter,	80—100 lb. NH_4
	P_2O_5	60 lb./ac.
	K_2O	90 lb./ac.
Beans:	P_2O_5	40 lb./ac.
	K_2O	120 lb./ac.
Wheat:	N	75 lb./ac.
	P_2O_5	45 lb./ac.
	K_2O	80 lb./ac.
•Fuel:	Corn	6.5 gal./ac.
	Beans	4.8 gal./ac.
	Wheat	4.7 gal./ac.
•Labor:	Corn	7.4 hrs./ac.
	Beans	5.5 hrs./ac.
	Wheat	4.2 hrs./ac.
•Yields:	Corn	143 bu./ac.
	Beans	42 bu./ac.
	Wheat	60 bu./ac

Comments:

The use of brand names does not constitute and endorsment by the Soil Conservation Service.

Exhibit 4

U.S. Department of Agriculture
Soil Conservation Service

Conservation Effects Worksheet

Name Joe Decisionmaker	Address Lima, Ohio	OPID No. JD123456	Field or Tract No. 1234

Resource Setting:
Bount-Morley soils, moderately sloping

Resource Problems Before Treatment
Excess sheet, rill and gully erosion, N & P_2O_5 in runoff, pesticides in runoff.

Benchmark (Present management system)
Conventional tillage for corn and beans, wheat drilled in lightly disked bean residue. No waterways.

Description of Treatment Option:
Grassed waterway
Conservation Cropping Sequence: (C-Sb-W)
Conservation Tillage: (No-till Corn and Soybeans)
(Mulch-till Wheat)
Nutrient Management, Pest Management

Actions (Kinds, amounts, and timing)	Effects (Effects of continuing the benchmark system)	Comparison of Effects of Benchmark and Treatment Option: Impacts	Decisionmaker Evaluation
CORN: • Apply N, P and K in the fall • Fall plow wheat stubble • Disk • Apply Lariat (Atrex-Lasso) • Field Cultivate to incorporate herbicides • Plant • Rotary hoe • Spray Banvel + 2, 4-D amine as needed • Row cultivate once **Beans:** • Plow in the fall • Disk twice • Plant and spray Turbo • Double back for 15" rows • Rotary hoe **Wheat in bean stubble:** • Disk once • Drill wheat	• P_2O_5 in runoff causing algae bloom in farm pond and contributes to pollution of Lake Erie. • Traces of pesticides in surface water • Nitrates in tile flows in the spring • Soil loss 12 tons/ac. • Three small gullies will enlarge • Soil tilth will decline • Machinery: 125 hp tractor moldboard plow disk field cultivator planter rotary hoe rowcrop cultivator • Chemicals: Corn: Lariat .88 gal./ac. Banvel 1/4 pt./ac. Beans: Turbo 1 qt./ac. Wheat: none • Fertilizer: Corn: N 140 lb./ac P_2O_5 60 lb./ac. K_2O 90 lb./ac. Beans: P_2O_5 40 lb./ac. K_2O 120 lb./ac. Wheat: N 75 lb./ac P_2O_5 45 lb./ac. K_2O 80 lb./ac. • Fuel: Corn 8.3 gal./ac. Beans 7.0 gal./ac. Wheat 5.5 gal./ac. • Labor: Corn 9.8 hrs./ac. Beans 8.8 hrs./ac. Wheat 5.0 hrs./ac. • Yields: (expect to decline over time) Corn 143 bu./ac. Beans 42 bu./ac. Wheat 60 bu./ac.	• Phosophorus runoff reduced • Less mobile herbicides used • Less leaching of nitrates • Soil Loss reduced 9 tons/ac. • Gully erosion eliminated • Infiltration increased • Power needs reduced 50 hp • Eliminate: Moldboard plow Field cultivator Rotary hoe Row cultivator • Less soil compaction • Slower planting • Need more time for scouting • Chemical use increased • Fertilizer requirements unchanged but timing of application is closer to when crop needs nutrients. • Fuel reduced: C 1.8 gal./ac. B 2.2 gal./ac. W 0.8 gal./ac. • Labor reduced: C 2.4 hrs./ac. B 3.3 hrs./ac. W 0.8 hrs./ac. • Yields will be maintained	(+) Pond will clear up (-) Poorer weed control (+) Better quality of water (+) Conserves moisture (+) less equipment damage (+) less ponding (+) can sell big tractor (+) less machinery to maintain and fewer trips (+) better root development (-) (-) (-) burn-down herbicide needed (+) Better utilization of nutrients (+) lower input costs (+) (+) (+) can use this time for scouting and more time for (+) livestock (+) (+)

Comments:
NOTE: This sheet is to be completed with the decisionmaker during the planning visit with the decisionmaker's evaluation recorded in the right hand column.

Exhibit 5

A composite picture of adopter categories

Adopter category	Salient values	Personal characteristics	Communication behavior	Social relationship	% of Population
Innovators	"Venturesome", willing to accept risks	Youngest age; highest social status; largest and most specialized operations; wealthy	Closest contact with scientific information sources; interaction with other innovators; relatively greatest user of impersonal sources	Some opinion leadership; cosmopolite	2.5
Early Adopters	"Respect"; regarded by many others in the social system as a role model	High social status; large and specialized operations	Greatest contact with local change agents	Greatest opinion leadership of any category in most social systems; localite	13.5
Early Majority	"Deliberate"; willing to consider innovations only after peers have adopted	Above average social status; average-sized operations	Considerable contact with change agents and early adopters	Some opinion leadership	34.0
Late Majority	"Skeptical"; overwhelming pressure from peers needed before adoption occurs	Below average social status; small operations; little specialization; small income	Secures ideas from peers who are mainly late majority or early majority; less use of mass media	Little opinion leadership	34.0
Laggards	"Traditional"; oriented to the past	Little specialization: lowest social status; smallest operations lowest income; oldest age	Neighbors, friends, and relatives who have similar values are their main information sources	Very little opinion leadership; semi-isolates	16.0

Source: Rogers and Shoemaker, 1971.

Exhibit 6

Case Study Guidance Summary

1) **Select priority resource problem**

   --e.g., soil productivity loss, water quality degradation, etc.

2) **Select typical resource use system**

   --Crop rotation and/or livestock enterprise

3) **Select cooperative landuser**

4) **Record conservation effects worksheet data for benchmark situation**

   --Actions (before or without treatment system inputs)
   --Effects (before or without treatment system outputs)
   (also note landowner objectives)

5) **Record conservation treatment information worksheet data from option situation**

   --Actions (after or with treatment system inputs)
   --Effects (after or with treatment system outputs)

6) **Record conservation effects worksheet data on the impacts of treatment**

   --Changes that occur as a result of treatment, i.e., "after treatment minus before treatment" effects or "with minus without treatment" effects

7) **Record conservation effects worksheet information on the decisionmaker's evaluation of the impacts**

   --Cooperator's value judgement on the merits of experienced changes due to treatment

8) **Update Case Study with additional years' data as needed**

9) **File final Case Study(ies) in Section V-B of the FOTG / Use them for planning, training, share with other field offices, etc.**