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Guidance for the Development and Use of Case Studies as a Source of Conservation Effects Information

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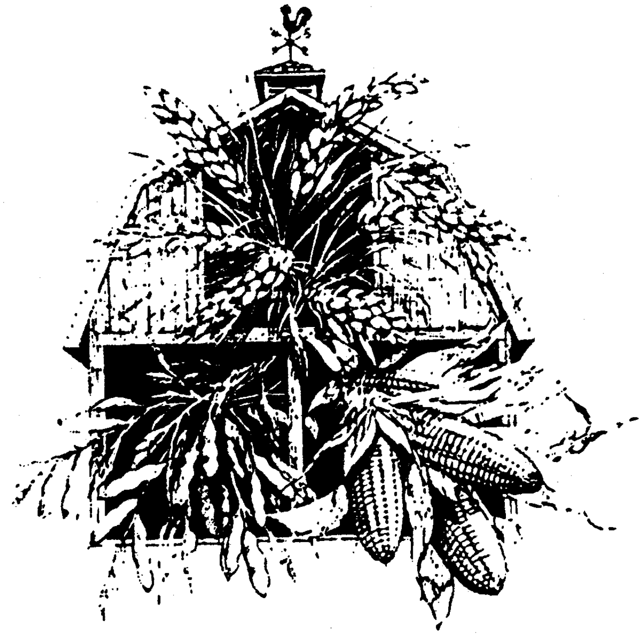
Section V-C

Procedural References



Guidance for the Development and Use of Case Studies as a Source of Conservation Effects Information

Purpose: To provide guidance to SCS field office and conservation district employees in the collection and use of case study information. Case studies from representative resource problem situations should be stored in the Tech Guide, Section V-B-1, titled "Producer Experiences" for use in future planning efforts and training activities.

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Introduction

What are case studies and how can they be used?

A "case study" is an organized set of quantitative and qualitative information that describes before and after treatment resource conditions.

A case study is one example of how a recommended conservation treatment, such as a change in management, practice or system installed, actually worked out to meet cooperator objectives and effectively treat resource problems.

Case studies provide field offices and districts with a distinct means to improve on-going conservation planning. Sharing case study results with potential cooperators should also promote new conservation planning opportunities and accomplish additional levels of treatment.

Case studies developed by field office and district professionals are intended to be a relatively quick and practical means of providing potential cooperators in comparable resource situations with a vision of the way their current situation might be modified to achieve a desired resource condition. They are not intended to be definitive analyses of resource treatments which scientifically determine complete cause and effect relationships.

Thus, case studies to evaluate the effects of conservation should contain neither the degree of detail nor the rigor of analysis used in university level case studies. However, they should be much more insightful than casual observation and help us gain a better understanding of the ecological implications of change from current production systems to new systems based on conservation treatments.

"Before and after treatment" information allows for estimating change, but because exact cause and effect relationships between treatment inputs and conservation outputs (results) are difficult, and in some cases impossible to identify, **the expected focus of case studies should be on the results or outcomes of treatment**. Given that each cooperator's resource situation is unique, case studies should, at a minimum, describe successful treatment situations with some expectation for replicating the results. Unsuccessful treatments should also be noted so mistakes are not repeated.

Many end products can be derived from the development of case study information in addition to the case studies themselves:

- Brief information **brochures** containing highlights of the resource problems addressed, applied treatments, experienced effects, farmer satisfaction, etc.;
- Brief one-page **information sheets**, modeled after fact sheets;
- **Training materials** for instructing field and district professionals in planning and use of technical information;
- Local news and farm magazine **articles**; and
- Case study farms can be the focus of Soil and Water or Resource Conservation District **tours and training exercises**;

All of these products and uses could be part of public information campaigns and training to illustrate effective ways to evaluate and treat resource problems.

Potential problems to be aware of with Case Studies

Attributing change to a conservation treatment is potentially the most complex and uncertain aspect of SCS case studies. Researchers do not like to predict results based on only one example. In fact, this is a weakness of using the case study approach to predict the effects and impacts of conservation work.

However, that weakness does not destroy the usefulness of the approach. Examples of the potential problems with case studies that could complicate our understanding of the effects of conservation are:

- Variability in weather, e.g., unusually low rainfall during the growing season could cause yields to be lower than the levels expected when you planned the conservation system.
- Changes in management such as a change in varieties planted, fertilizer used or as a result of lessons learned during implementation, e.g., modifying tillage depth or timing;
- Measurement errors with respect to inputs, outputs or both;
- Some other factor might change between before and after treatment observations, e.g., biological or chemical changes in the soil which might solely be a function of time and be unrelated to the treatment, i.e., increasing salinity; and
- Significant statistical variation with respect to yields or any other measurable outcome can occur which may or may not be related to the treatment.

Paying close attention to details, objectivity in planning and collecting "after treatment" data, and experience in conducting such studies will help minimize errors.

In addition, data collected over several seasons will tend to minimize the impact of years with unexpectedly low or high responses to treatment.

Above all, you need to make it clear to subsequent farmers that "These are the results achieved on one of your neighbor's farms. We can't guarantee that you'll do the same, but we feel reasonably certain that comparable changes could be achieved. The exact magnitude of change most likely will be different, but should fall within some reasonable proximity to the case study results."

Are case studies mandatory?

Case studies are highly recommended as planning and public information tools, but they are not mandatory nor are there any required formats that must be followed if undertaken.

The examples attached to this guidance are meant to serve as format examples that may be utilized. (See Exhibits 1 and 2, "Conservation Effects Worksheet - Benchmark Management System and Conservation Effects Worksheet - Treatment Options."

Conservation effects information can come from a variety of sources such as university research, conservation field trials, and the expert knowledge of experienced planners within and outside of our agency as well as from case studies.

Case studies are simply another planning tool -- perhaps one of the most practical for improving our planning, for prioritizing assistance, and for reaching out to new farmers.

Some conservation practices and systems are so simple or easily understood that most of your farmers will not need case studies to reach a decision. Also, mandatory local ordinances regarding certain landuse activities may require specific practices such as sediment basins below irrigated fields, filter strips adjacent to water bodies, or nutrient management plans. Case studies might be very desirable in these situations, but they certainly are not mandatory.

The incorporation of conservation effects information into the FOTG is a long-term, dynamic endeavor with case studies being one effective means to develop representative effects information to aid farmers and ranchers in conservation decisionmaking.

Case Study Development and Use

Most case studies should be a record of what happened under certain stated conditions when conservation treatments were applied. A case study need not be approached as a complex research effort requiring explicit hypotheses, research design, and statistical tests of significance, but each of these concepts could be considered and used.

Planners should begin by thinking about the resource base in their area (county resource and landuse situations). Ask **"What resource settings are dominant in this county and what are the main associated problems and opportunities?"**

Answering this question will help you develop a strategic view of the area and will direct case study efforts to situations where the needs and opportunities are greatest. Some basic county level resource and landuse data will facilitate the initial part of the case study development process.

Once the dominant crop/livestock and resource settings for your county are identified, predominant treatments can be identified and aligned with the landuse situations. Then priorities can be established for developing case studies. It is anticipated that most field offices have 5 to 7 dominant crop/livestock and resource situations and perhaps a comparable number of dominant treatment systems.

The **key to success** with case studies is to select resource situations with a broad applicability to many landusers, i.e., the studies should be developed for major resource concerns on soil mapping units and in resource use situations that represent a significant portion of the resource users in your county.

This data and your understanding of the resource conditions, conflicts in use, current trends, and expected future changes, can be viewed along with knowledge of the socio-economic groups in your area to select case study subjects and farmer candidates.

Selecting the Farmer

A cooperative, knowledgeable farmer is one of the most important elements for a successful case study.[1] If the cooperating farmer can be classified as an "early adopter" rather than a "late majority" or "laggard", you will have an easier job of convincing other farmers to accept the results (see Exhibit 3 "A Composite Picture of Adopter Categories" for added information). For new and untested technology, an innovator is probably the best prospect for a case study.

What information needs to be collected?

A case study can be conducted as part of your ongoing conservation planning work with little extra time needed during your review of the farm operation and while developing and evaluating alternatives (planning elements 4, 5 and 6).

Additionally, follow-up (element 10) needed after the conservation plan has been implemented (element 9), will serve to verify or reject planning expectations and the results that the decision maker hoped to achieve.

1

Studies show that a farmer's most respected source of information about new crops, practices, and technologies is other farmers. If you can cite results obtained on the farm of a respected local resident, you will have satisfied one of the key concerns of most farmers.

Therefore, planning notes from an existing conservation plan might contain all or most of the information needed to produce a good case study. However, for best utility, you will need to **structure the information in your case study to include data on the kinds, amounts, and timing of actions taken to implement conservation treatments.**

Typically, a case study will attempt to measure quantifiably the level of inputs and outputs associated with a particular conservation practice or system (see Exhibits 1 and 2). You should record farming operations undertaken, type of equipment used, dates of operations, number of operations to complete work, and the kinds and amounts of inputs such as seed, fertilizer, pesticides, tractor hours, fuel consumption and labor required.

To the extent that treatment significantly affects yields, erosion rates, and other observable indicators related to the resources of concern (soil, water, air, plants, and animals)--such data should also be recorded. Any significant changes in operational and managerial conditions and decisions should also be noted.

The degree of detail and selection of input and output factors to collect data for, should be guided by common sense and professional judgement. For example, the conservationist can ask himself the question: "What should I observe in order to gauge results and judge 'success' ?" Such efforts will help prioritize system variables and streamline data collection and analysis.

Alternative types of case studies

Case studies can be based on:

(1) a comparison of the "before and after treatment" conditions on a single farm;

(2) a comparison of two separate, but comparable resource and landuse situations on different farms or even on the same farm, i.e., one site "with and one without treatment"; or

(3) a simple recording of the results a farmer experiences "with treatment" on a single site regardless of the "before" treatment conditions.

The first and second alternatives mentioned above require that data be collected for both the "before treatment" or benchmark situation (without treatment) and the "after treatment" (with treatment) condition arising from the conservation option adopted.

The last alternative represents the simplest, easiest approach, but inherently has the greatest risk for misunderstanding cause and effect relationships because it focuses on "with treatment" conditions only. Interpreting specific changes attributable to conservation treatments with this method is not as valid as the other two approaches.

This may not matter, for the immediate future, if the optional situation is deemed more desirable than the new cooperator's present situation and the adoption of conservation technology is accompanied by the other innovations that were part of the case study example. However, a more precise understanding of the cause and effect relationships due to conservation is important for our work over the longer term. Indeed, conservation effects and impacts information incorporated into Section V over time should result in improvements to Section III.

Conservation Effects vs. Impacts

The difference between "before and after treatment" or "with vs. without treatment" input/output conditions represents change. This change may be all or in part due to the conservation treatment.

Change attributable to SCS/District-recommended treatment is defined as the conservation impact.

Effects represent the quantitative and qualitative descriptive characteristics of the outcomes of treatment only. They are the overall results which provide a general vision of the treatment and its effectiveness. The effects show what a practice or system looks like, its characteristics and results, and represent the general expectations achievable elsewhere if the resource conditions are relatively similar.

The effects of a conservation option can be relied upon by the planner for depicting the expected response to treatment for a given conservation option and resource situation. The effects information developed with approaches 1 and 2 will influence a new cooperator's expectations for change and can be used to focus new planning efforts in order to avoid unrealistic expectations based on a new cooperator's impressions of the case study estimated impacts (change).

The specific changes (impacts) realized in a case study can aid decision making, but are not always needed. Assuming that the new cooperator's resource and enterprise situation is comparable to the case study, then a general idea of the kinds of conditions (effects) to be created should meet his or her minimum information needs. Thus Alternative 3 is acceptable, but will not provide the new cooperator with a detailed understanding of the pre-treatment case study conditions nor an estimate of the changes realized as would the first two methods.

This point is very important because the exact change or impacts achievable will vary somewhat for every farmer who applies a particular conservation option and the case study approach that you select to share with a new cooperator will be showing one of several possible comparisons:

- between the new cooperator's current condition and the case study "before and after treatment conditions" (alternative approach #1);
- between the new cooperator's current condition and the case study "with and without treatment conditions" (alternative approach #2); or
- between the new cooperator's current condition and the case study "with or after treatment conditions" (alternative approach #3).

An understanding of these analysis concepts and case study approaches is essential to avoid confusion. Apart from time requirements, the approach used does not matter as long as the expected outcomes or effects are not unique and they should not be in similar resource settings, i.e., once again, the before treatment conditions and after treatment results should be representative and therefore replicable.

The main advantage of the first two methods for conducting a case study is the identification of conservation impacts (change). They also offer another advantage over the third approach. Data from "before and after" or "with and without" treatment case studies helps to assure that all important issues and planning steps have been followed. The conservation effects and associated impacts provide an abundance of information for new clients to begin evaluating the appropriateness of the case study to their specific situation and then build their own conservation plans.

In summary, the results of any case study must be described within a context which identifies the resource situation and the actions and timing of those actions taken to achieve expected treatment outcomes.

Several methods for organization and development may be used and a minimum of data requirements must be met to help other farmers understand the consequences of their choice.

The data collected in a case study at a minimum must:

1. be specific for a conservation practice or system;
2. attempt to hold all variables not related to the conservation treatment constant (this requires careful farmer selection and consultation during implementation to avoid changes in varieties, fertilizer, etc.)
3. include the kinds, amounts and timing of treatment actions; and
4. identify the physical and biological effects associated with those actions.

Item number 2 above is impossible to completely control because every year's weather, crop sequence, and methodology of operations will vary. Under certain circumstances, a case study effort could even be rendered useless because of weather, farmer finance, or other induced changes unrelated to the conservation treatment.

How should the information be displayed?

Exhibit 1 illustrates one way case study information could be displayed for use with a new cooperator.

The left-hand column shows the kinds, amount and timing of actions undertaken by the case study farmer in the "before treatment" or benchmark condition.

The second column from the left shows the effects of those actions. This data is recorded during elements 4 and 5 of the planning process.

Exhibit 2, columns one and two show the actions and effects of the Treatment Option. The effects of the Treatment Option are then compared to the effects of the benchmark system. The third column from the left shows the impacts (changes) of adopting the option displayed. Again, the impacts are the differences between the effects observed in the "before treatment" benchmark condition and those effects realized in the option or "after treatment" condition. The evaluation of impacts essentially constitutes element 10 of the planning process.

Finally, the last or right-hand column shows the farmer's perception of the value of those impacts. Such a display of the case study information can be especially helpful to assist a new farmer to decide whether or not to develop a conservation plan.

Care and good judgement must be used in deciding whether to use the participating farmer's name when presenting results to others. Ideally, the case study farmer would consent to the public use of the results and also be an esteemed local resident. However, if confidentiality is a concern, case study information can be presented carefully without reference to the particular cooperating farmer.

How do I handle multi-year rotations?

Information from each of the years of a multi-year rotation must be collected and kept separate. If a multi-year rotation is the conservation option you are evaluating, and you want to compare it with a continuous crop benchmark condition, then you will need to do some summarizing and averaging over those years to make comparisions.

Some planning assistance from the area or state office may be needed for your first case study efforts, but you will soon develop a good idea for handling multi-year rotations and other complications. The point to remember is that you must collect the information regarding the kinds, amounts and timing of actions and the resulting effects for each year of the treatment rotation that is different from the benchmark or "before treatment" condition. Exhibit 1 displays an example of a two-year rotation.

Case Study Information Needs Summary

The following is a comprehensive list for conducting case studies that evaluate change. Some case studies (see page 4 "Alternative types...") would not need "before treatment" data.

(See Exhibit 4 "Case Study Guidance Summary" for an outline of the steps to conduct a case study)

1. Benchmark or "before treatment" resource and landuse situation (soil mapping unit, slope range, crop rotation, etc.), problems and opportunities;

2. The Farmer's objectives, concerns and understanding of his resource condition and trends;

3. Treatment response to problem: Kinds, amounts and timing of actions whether practice or system specific;

4. Conservation effects by relevant resources: land, air, water, plants, animals and as they relate to on-farm operations. The effects measured could be, e.g., soil pH, nutrient or pesticide loadings, or management related, etc., but will invariably include the physical and biological effects[2]. Profitability might also be included;

5. Conservation impacts (optional for use with alternative methods 1 and 2 covered previously): The changes that occur as a result of treatments applied (the difference between "before treatment" or the Benchmark conditions and the Option or "after treatment" conditions); change in profitability might also be included.

6. Other impacts, such as changes that occur which we cannot attribute to the conservation treatment: these include changes that we are unable to explain or quantify, but which are observable.

7. Did the "after treatment" condition fulfill SCS/District goals as well as the farmer's needs and objectives?

8. Other observations? Lessons learned? Information gaps and research needs?

> Remember that the purpose is to develop meaningful effects information that can help explain the features and benefits of conservation treatments.

Developing Case Studies in a Group Setting

One of the most interesting and productive ways to develop case studies is through the simultaneous conduction of numerous studies by a group of employees working within a specified geographic area.

Group interaction could greatly facilitate development of case studies and training in their development and use. For example, suppose that each conservation planner within a given area develops one complete case study during the fiscal year. Assuming that they could be completed within one year, such an effort could be part of a regional staff meeting, e.g., an Area/Field Office meeting. The initial meeting could be used to explain the case study process, set objectives, develop farmer selection criteria, identify and assign study priorities, and establish target dates for review and completion.

In order to gain the most from group interaction, case studies could either be assigned so that all participants work on the same resource/landuse situation or on completely different situations.

Working in one group would concentrate attention on a common theme and enrich the depth of mutual understanding of both the case study process and the technical aspects of treatments. Working individually or in small groups would facilitate a broader understanding of multiple situations and avoid duplication of efforts.

At subsequent staff meetings, planners could make a brief report on their case study progress. The conservation plan itself, as well as the case study, will likely be improved by the observations, questions, and suggestions of your colleagues. Omissions or needs for additional effort might be identified with everyone benefiting from the experience of others. Such efforts would have a positive influence on the participant's interest in case studies and the quality of the work performed.

Once the first follow-up session has been completed, studies, reports, or display sheets could be shared among the participants to maximize the transfer of information. Examples of particularly effective write-ups and data displays will be helpful to everyone involved even if the data itself is not pertinent for use in other areas.

In subsequent years, effort should be directed towards filling the gaps in our understanding of existing case studies and determining other potential case study topics that could be developed in the future. Improvements could be achieved through additional data on already completed case studies and additional efforts with new farmers.

In most cases, planners should be encouraged to undertake at least one case study per year to maintain their skills of observation, analysis and reporting.

2 Information on the costs and returns associated with a case study can be developed to help market conservation. Consult your state economist for assistance.

Summary and Conclusions

Conducting case studies should not require significant efforts beyond normal conservation planning activities. Properly structured, they will provide more insights on actual results from conservation treatments experienced by producers in your area.

These insights will improve your knowledge of the outcomes experienced by farmers. Therefore, you will be able to express your recommendations for treatment in a more credible manner because of greater "product" knowledge and understanding. Farmers will recognize this expertise and your effectiveness will increase accordingly.

You will also be better able to apply "Professional Selling Skills" and other conservation marketing concepts to identify and target priority resource problems and potential cooperators.

Case studies will also help build a permanent record of treatment results that are very useful for selling conservation and that won't disappear as employee retirements and transfers occur. They should also serve technology transfer purposes when shared between field offices and with other interested parties. The information contained in a case study enables planners with various levels of experience to have access to the knowledge of the best.

Finally, going through the process of developing and evaluating a case study could be an excellent training exercise for new employees to refine their knowledge of planning and to enhance measurement skills and use of the predictive models.

U.S. Department of Agriculture
Soil Conservation Service

Exhibit 1
Conservation Effects Worksheet
Benchmark Management System

Name Joe Decisionmaker

Address Rural, U.S.

Resource Setting:

Blount-Morley soils, moderately sloping

Resource Problems Before Treatment

Excessive 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

Actions - Present Management (Kinds, amounts, and timing)	**Effects** (Effects of continuing the benchmark system)
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 -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/acre -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

Comments:

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Soil Conservation Service

Exhibit 2
Conservation Effects Worksheet
Treatment Options

Page____

Name Joe Decisionmaker	**Address** Rural U.S.	**OPID No** JD123456.	**Field or Tract No.** 1234

Treatment Option No.	**Description of Treatment Option** (With treatment management system):
	Grassed waterway, conservation cropping sequence (C-Sb-W), Conservation Tillage (NT corn & beans, MT wheat) Pest Management, Nutrient Management (meets RMS criteria);

Actions - Proposed Management (Kinds, amounts, and timing):

Nutrient Management

-See sections 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 week 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 with Roundup
-Plant & spray Turbo & Gramoxone double back for 14" rows
-Spot spray quackgrass with Fusilade & thistles with Basagran as needed

Mulch-Till Wheat in Bean Stubble

-Disk bean stubble
-Drill wheat
-Apply nitrogen in late February

Effects (Effects of conservation treatment):

RMS Installed

-Soil loss 3 tons/acre
-Nutrients better utilized
-Nutrient pollution reduced
-Less mobile herbicides used
-Scouting for pests conducted
-Waterway eliminated gully
-Waterway removes 1/2 acre of cropland
-Waterway provides 1/2 acre of wildlife habitat
-Residue improves tilth, decreases runoff
-Sedimentation potential reduced
-Machinery:
75 HP tractor
No-till planter
Chopper

-Chemicals:	Corn:	Gramoxone	2 pt/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	60 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

Comparison of Effects of Benchmark and Treatment Option

Impacts	Decisionmaker Evaluation
-Phosphorus runoff reduced	(+) Pond will clear up
-Less mobile herbicides used	(-) Poorer weed control
-Less leaching of nitrates	(+) Better quality of water
-Soil loss reduced 9 tons/ac	(+) Conserves moisture
-Gully erosion eliminated	(+) Less equipment damage
-Infiltration increased	(+) Less ponding
-Power needs reduced 50 hp	(+) Can sell big tractor
-Eliminate:	
Moldboard plow	(+) Less machinery to maintain and fewer trips
Field cultivator	(+)
Rotary hoe	(+)
Row cultivator	(+)
-Less soil compaction	(+)
-Slower planting	(+) Better root development
-Need more time for scouting	(-)
-Chemical use increased	(-)
	(-) Burn-down hebicide needed
-Fertilizer requirements unchanged but timing of application is closer to when crop needs nutrients	(+) Better utilization of nutrients
-Fuel reduced: Corn 1.8 gal/ac	(+) Lower input costs
Beans 2.2 gal/ac	(+)
Wheat 0.8 gal/ac	(+)
-Labor reduced: Corn 2.4 hrs/ac	
Beans 3.3 hrs/ac	(+) Can use this time for scouting and more time for livestock
Wheat 0.8 hrs/ac	
-Yields will be maintained	(+)
	(+)
-1/2 acre less cropland	(+)
-1/2 acre more wildlife nesting habitat	(-)
	(+)

Comments:

The use of brand names does not constitute an endorsement by the Soil Conservation Service

Exhibit 3

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"; over-whelming 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 4

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 effects worksheet data from treatment option situation**

--Actions (after or with treatment system inputs)
--Effects (after or with treatment systems 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 of "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.**