Adaptive Management a concept for Producers and CCA

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What If…
Or
How…
On
My Farm

Adaptive Management

CERTIFIED CROP ADVISER

Definition:

- Adaptive management is a process of testing an idea to evaluate and adjust the application of a conservation practice over multiple seasons.

Goal:

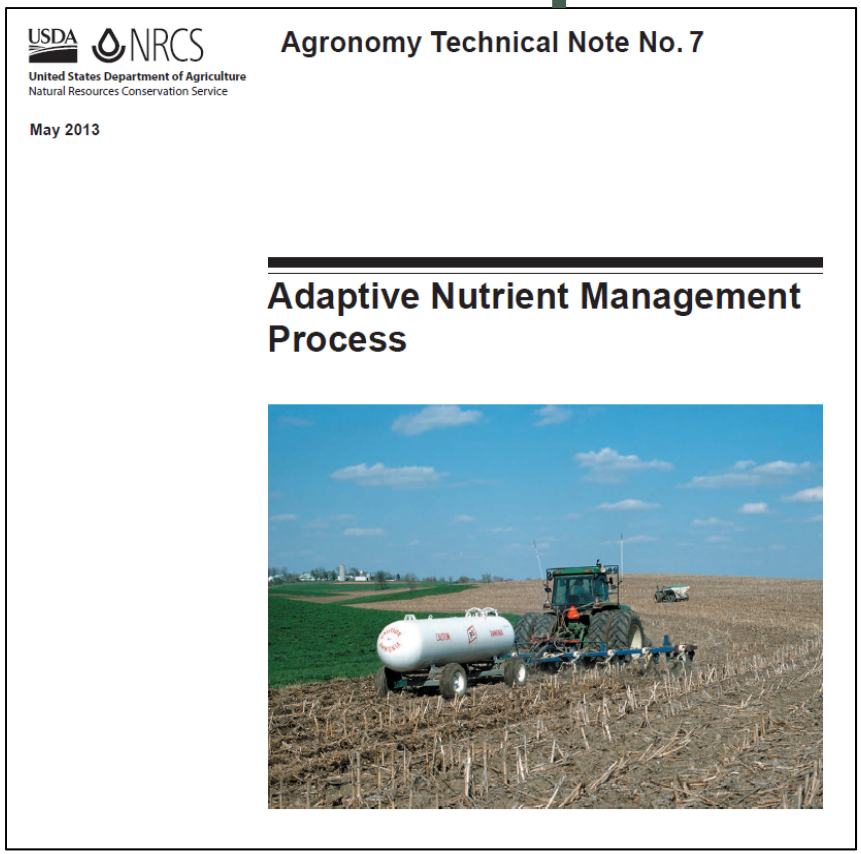
- Test and evaluate how a practice or technology can best be applied on a given farming operation or site condition.
- Learning experience for the **producer** and **consultant**.

Origin of Adaptive Management

- A component of a planning or problem solving process.
- A method to reduce risk and deal with uncertainty.
- A learning process (individual and group).
- Many questions can only be answered by experience and experiment.

A process used by the Iowa Soybean Association & On Farm Network.

NRCS Technical Notes
Adaptive Management


USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

May 2013

Agronomy Technical Note No. 7

Adaptive Nutrient Management Process


USDA
United States Department of Agriculture

July 2014

Agronomy Technical Note No. 10

Adaptive Management for Conservation Practices

http://directives.sc.egov.usda.gov/
Under Technical Notes>Title 190>Agronomy

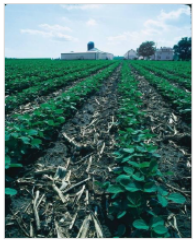
Supporting Reference Material

329 No Till

USDA United States Department of Agriculture

Guide Sheet – Implementing Adaptive Management

Conservation Practice Standard Code 329 – Residue and Tillage Management, No Till



Introduction and Purpose

Adaptive management is a systematic process to collect, monitor, analyze, and learn from results of evaluations of practices conducted on growers' fields. The goal of the adaptive management approach is to test and evaluate how a practice can best be applied on a given farming operation or site condition.

The purpose of this guide sheet is to provide guidance to plan and implement adaptive management of the NRCS Conservation Practice Standard (CPS) Code 329, Residue and Tillage Management, No Till. An NRCS payment schedule scenario was developed within the CPS Code 329, Residue and Tillage Management, No Till, to provide financial assistance to support adaptive management.

Guidelines for Adaptive Management Application for No Till:

1. Follow the guidance in the Agronomy Technical Note 190-AGR-10, Adaptive Management for Conservation Practices.
2. The evaluation should be carried out for at least 3 years and preferably on the same area each year. There may be cases where this is not practical.
3. The application and hypothesis of at least one variable must address and meet the criteria and specifications of the CPS Code 329, Residue and Tillage Management, No Till, for at least one of the purposes. Example trials/evaluations may include:
   a. Compare no till vs convention till or mulch till.
   b. Compare no till in a cover crop to no till without a cover crop.
   c. Compare different no till or mulch till planter types or configurations (e.g., cross slot planter vs a hoe drill).
   d. Evaluate different coulter or residue clearing devices.
   e. Evaluate strip till vs no till.
4. The evaluation should include the services of a consultant with knowledge of no till farming to help plan the evaluation, layout the plots, monitor the plots during the season, assist in gathering the required data (yield, soil tests, residue counts, soil health measurements, etc.), and analyze the data that will support the purpose of the evaluation.
5. The evaluation can focus on one or more results, e.g., may collect data to not only address yield but also changes in soil health parameters (aggregate stability, infiltration, organic matter, etc.).
6. Analyze the data each year and at the end of the trial period, usually 3 years.
7. The annual and final results and analysis should be jointly reviewed with NRCS, the grower, and consultant involved.

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345 Reduced Till

USDA United States Department of Agriculture

Guide Sheet – Implementing Adaptive Management

Conservation Practice Standard Code 345 – Residue and Tillage Management, Reduced Till

Introduction and Purpose

Adaptive management is a systematic process to collect, monitor, analyze, and learn from results of evaluations of practices conducted on growers' fields. The goal of the adaptive management approach is to test and evaluate how a practice can best be applied on a given farming operation or site condition.

The purpose of this guide sheet is to provide guidance to plan and implement adaptive management of the NRCS Conservation Practice Standard (CPS) Code 345, Residue and Tillage Management, Reduced Till. An NRCS payment schedule scenario was developed within the CPS Code 345, Residue and Tillage Management, Reduced Till, to provide financial assistance to support adaptive management.

Guidelines for Adaptive Management Application for Reduced Till:

1. Follow the guidance in the Agronomy Technical Note 190-AGR-10, Adaptive Management for Conservation Practices.
2. The evaluation should be carried out for at least 3 years and preferably on the same area each year. There may be cases where this is not practical.
3. The application and hypothesis of at least one variable must address and meet the criteria and specifications of the CPS Code 345, Residue and Tillage Management, Reduced Till, for at least one of the purposes. Example trials/evaluations may include:
   a. Compare no till vs reduced till.
   b. Compare reduced till with a cover crop to mulch till without a cover crop.
   c. Compare different mulch tillage tools or configurations to compare yield and surface residue management.
   d. Evaluate different high disturbance drills or configurations of the drills.
   e. Evaluate different chisel points or rolling baskets.
   f. Evaluate reduced till vs conventional till.
4. The evaluation should include the services of a consultant with knowledge of reduced till (residue management) farming to help plan the evaluation, layout the plots, monitor the plots during the season, assist in gathering the required data (yield, soil tests, residue counts, soil health measurements, etc.), and analyze the data that will support the purpose of the evaluation.
5. The evaluation can focus on one or more results, e.g., may collect data to not only address yield but also changes in soil health parameters (aggregate stability, infiltration, organic matter, etc.).
6. Analyze the data each year and at the end of the trial period, usually 3 years.
7. The annual and final results and analysis should be jointly reviewed with NRCS, the grower, and consultant involved.

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340 Cover Crop

USDA United States Department of Agriculture

Guide Sheet – Implementing Adaptive Management

Conservation Practice Standard Code 340 – Cover Crop

Introduction and Purpose

Adaptive management is a systematic process to collect, monitor, analyze, and learn from results of evaluations of practices conducted on growers' fields. The goal of the adaptive management approach is to test and evaluate how a practice can best be applied on a given farming operation or site condition.

The purpose of this guide sheet is to provide guidance to plan and implement adaptive management of the NRCS Conservation Practice Standard (CPS) Code 340, Cover Crop. An NRCS payment schedule scenario was developed within the CPS Code 340, Cover Crop, to provide financial assistance to support adaptive management.

Guidelines for Adaptive Management Application for Cover Crops:

1. Follow the guidance in the Agronomy Technical Note 190-AGR-10, Adaptive Management for Conservation Practices.
2. The evaluation should be carried out for at least 3 years and preferably on the same area each year. There may be cases where this is not practical.
3. The application and hypothesis of at least one variable must address and meet the criteria and specifications of the CPS Code 340, Cover Crop, for at least one of the purposes. Example trials/evaluations may include:
   a. Compare cover crop vs no cover crop.
   b. Compare species of cover crops.
   c. Compare a mixture of species of cover crops vs single species.
   d. Compare 2 different termination methods or times.
   e. Compare 2 different seeding methods.
4. The evaluation should include the services of a consultant with knowledge of cover crops to help plan the evaluation, layout the plots, monitor the plots during the season, assist in gathering the required data (yield, soil tests, residue counts, soil health measurements, plants per square foot, biomass produced, etc.), and analyze the data that will support the purpose of the evaluation.
5. The evaluation can focus on one or more results, e.g., may collect data to not only address yield but also changes in soil health parameters (aggregate stability, infiltration, organic matter, etc.).
6. Analyze the data each year and at the end of the trial period, usually 3 years.
7. The annual and final results and analysis should be jointly reviewed with NRCS, the grower, and consultant involved.

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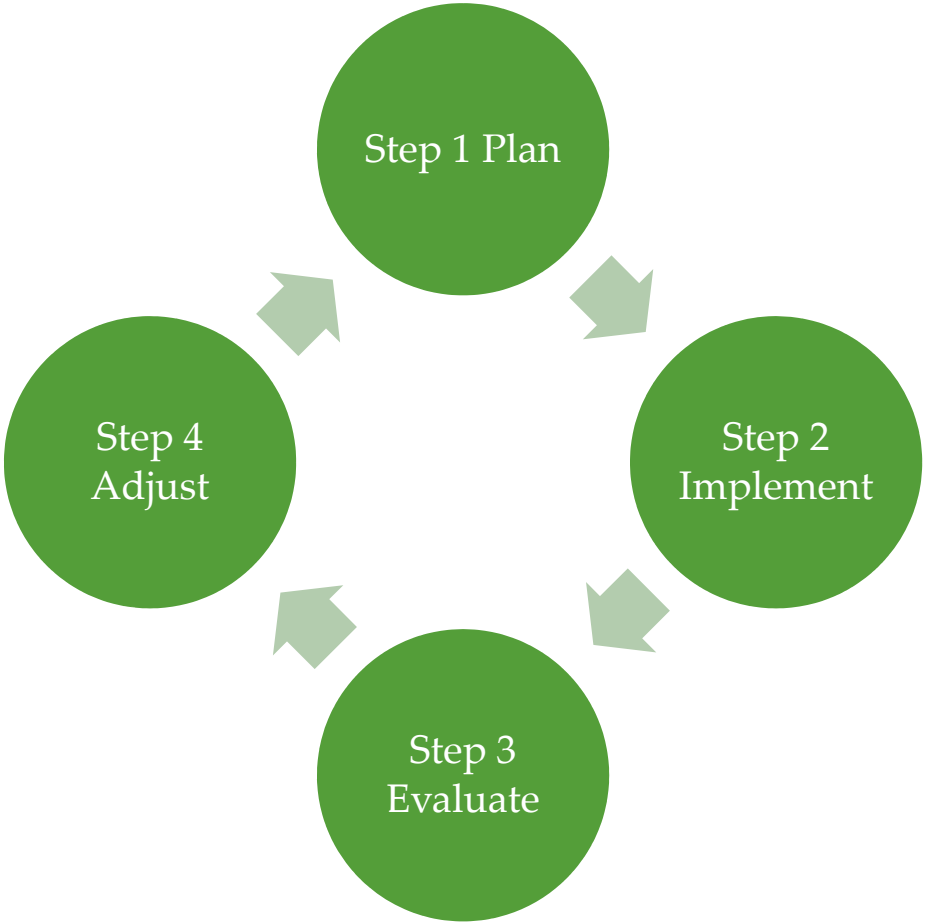
Adaptive Management Process



Conducting on-farm field trials – a process:

- **Planning**
  - Developing a hypothesis—"If I make this change, I expect these results."
  - Planning of replicated plot trials.
  - Determining the resources needed to carry out the plot trials.
  - Measuring or "laying out" the replicated plot trials in the field.
- **Implementing**
  - Establish / Install
  - Collecting data important to the evaluation of your hypothesis (may involve multiple data collections throughout the year).
- **Evaluate**
  - Analyzing & Summarize the data collected.
- **Adjust**
  - Conclusions, "Adapting".

What does it look like?

Table 1 Plot trial with two treatments replicated four times

Replication 1		Replication 2		Replication 3		Replication 4	
B Treatment	A Treatment	A Treatment	B Treatment	A Treatment	B Treatment	B Treatment	A Treatment

Replications improve accuracy of the results

Provides better information to make decisions

Adaptive Management

Single Producer

Multiple Producers

Adaptive Management - The Learning Process

- **Producer Involvement** on Their Land & Their Question or Opportunity with a Consultant
- **Data** is collected, summarized, analyzed, and presented in a format that gives context and meaning to the farmer.
  - A process is provided to determine LSD
- Options for **Farmer Interaction**
  - Individual Farmers
  - Farmer Group – up to about 20 producers
    - Present data and "facilitate" producers to discuss, ask questions, propose improvements

NRCS Assistance

- Technical Support
  - Conservation Planning
  - Plan new practice/technology
- Financial Support via EQIP
  - Current Eligible Practices
    - CPS 590 Nutrient Management
    - CPS 329 Residue Management, No Till
    - CPS 345 Residue Management, Reduced Till
    - CPS 340 Cover Crops

Adaptive Management

Opportunities: Win-Win

- For the Producers
  - Try and evaluate new practices and technologies
  - Minimize risk
  - Make sound decisions

- For Consultants and Ag Retailers
  - Technical service
  - Promotes new technology
  - Develops experiences that can improve your services

Helping People Help the Land

Sound Agronomy ➡ Healthy Environment