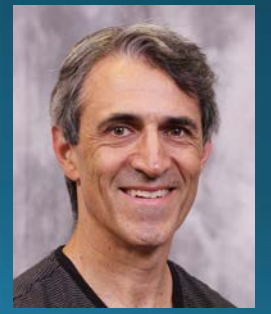
Using Case Studies to Facilitate Farmer Conservation Decisions

http://www.soilsforlife.org.au/images/case-studies-title-image3.jpg

Dr. Douglas Jackson-Smith
Utah State University
Dr. Bradford Barham
University of Wisconsin
NRCS Webinar, May 14, 2015



PRETEST

TODAY:
REVIEW 4 KEY CHOICES

1. GOALS
2. SELECTION
3. CONTENT
4. FORMATS

https://tobendlight.files.wordpress.com/2012/10/choices.jpg

http://moradpour.com/wp-content/uploads/2011/01/19162518o_d2633e1ca6.jpeg

WHY DO CASE STUDIES?

Reporting

- Documenting impacts
- Success stories

Research

- Depth & detail
- Real world context
- Comparative case studies

Outreach

http://plrcontentmarketing.com/wp-content/uploads/2013/10/case-studies.jpg

POSSIBLE GOALS

a) Providing scientifically valid data to evaluate whether conservation practices actually work
b) Demonstrating to USDA leadership and Congress that our programs have positive impacts
c) Proving to skeptical farmers that conservations practices will benefit them
d) Helping farmers understand the pros and cons associated with adopting a conservation practice

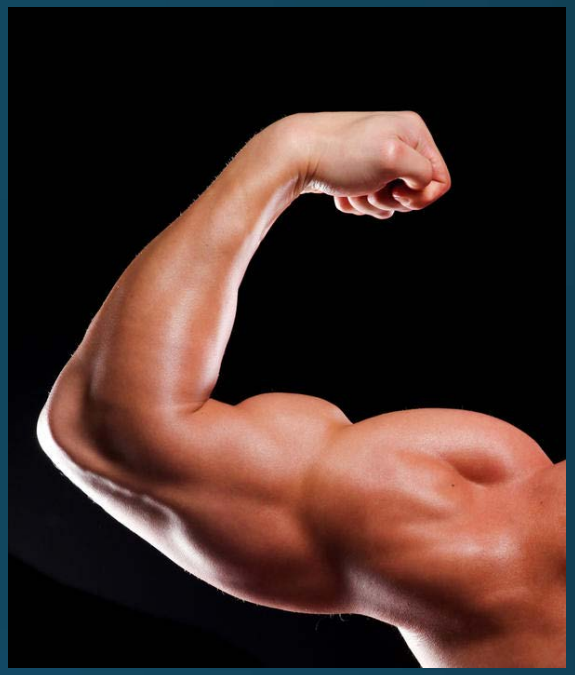
POSSIBLE GOALS

a) Providing scientifically valid data to evaluate whether conservation practices actually work
b) Demonstrating to USDA leadership and Congress that our programs have positive impacts
c) Proving to skeptical farmers that conservations practices will benefit them
d) Helping farmers understand the pros and cons associated with adopting a conservation practice

OUR FOCUS TODAY

Help potential users of conservation practices make more informed decisions about whether to try/use a practice – based on the experience of a farmer like them.

CASE STUDIES AS OUTREACH TOOL



http://elitetrack.com/wp-content/uploads/2015/01/strength_training.jpeg

STRENGTHS

COMMUNICATION

- Interesting
- Bring research findings to life

CREDIBILITY

- Farmers see themselves in the results

AUTHORITY

- Allow farmers to speak to farmers

PICKING CASE STUDY FARMS

PRINCIPLES (outreach use)

CREDIBILITY

- Will this farm be credible to target audience?

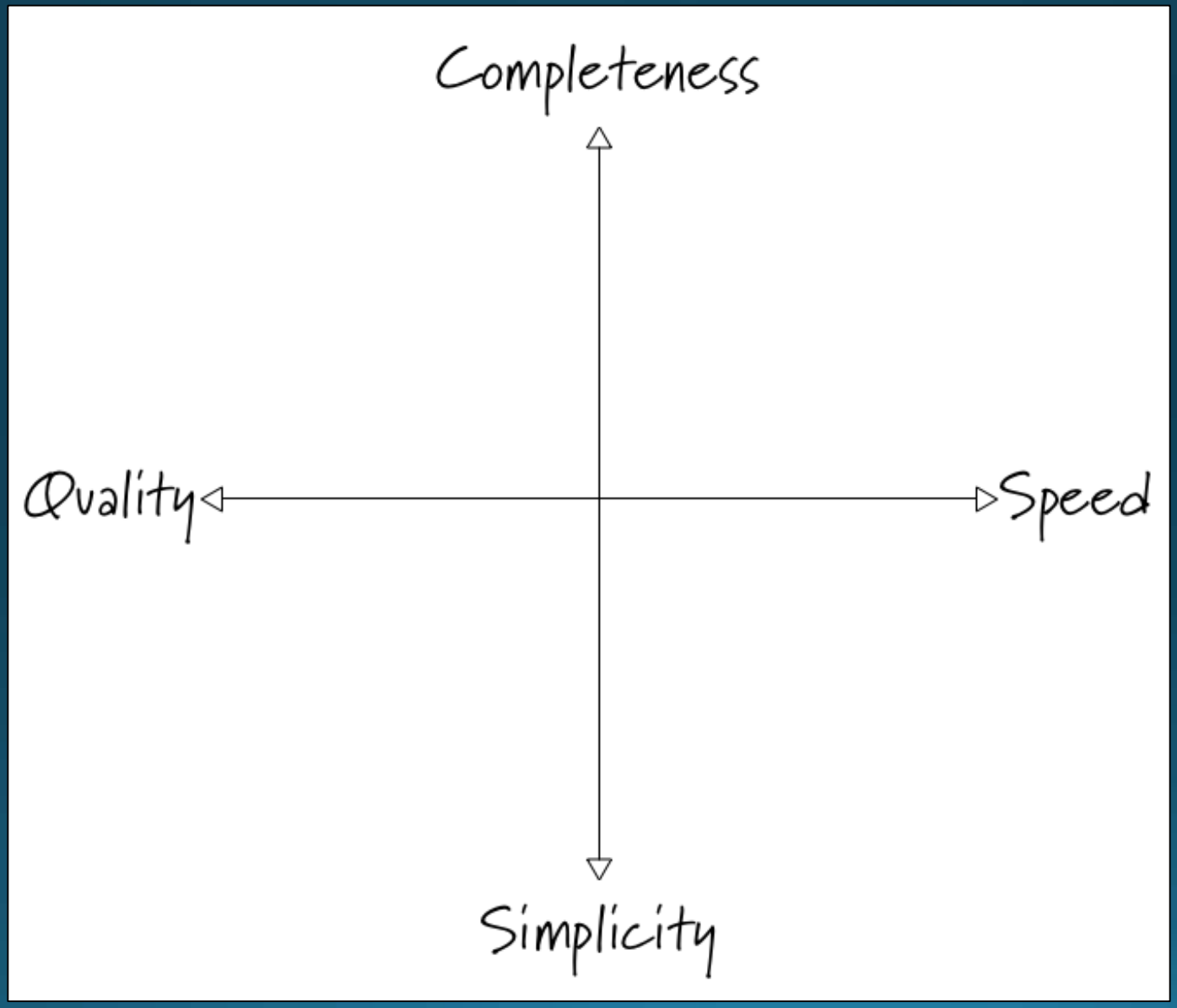
REPRESENTATIVENESS

- It is representative of the experiences most farmers have had with this conservation practice?

DIVERSITY

- Do you have case studies that reflect different types of farms in your area?

WHAT TO INCLUDE?



http://kief.com/images/quality-speed-quadrant-base.png

WHAT TO INCLUDE?

CONSIDERATIONS

- Touch on all topics to some degree
- Differences = degree of detail
- Tradeoff: depth vs. accessibility

TOPICS

- Context – who, where, when, what, why
- Outcomes
- Broader issues that influence outcomes

CONTEXT

WHO

- Describe farm operation, farmer, farm household

WHERE

- Describe where the farm is – biophysical setting

WHEN

- Describe when the farmer started process of adoption, how long they've used the practice

WHAT

- Describe what conservation practice was used

CONTEXT: WHY

Motivating reasons for adopting practice under study

Try to get inside their head then as well as now.

- Motivations might not be same as what they value now.

OUTCOMES

- Farm production outcomes (e.g., yield)
- Conservation / environmental outcomes
- Economic & social outcomes

http://blog.gogrid.com/wp-content/uploads/a-farmer-reaps-his-wheat-crop-_504_618900_0_14102424_500.jpg

http://www.foodsafetynews.com/files/2013/08/EIS_406x250.jpg

OUTCOMES

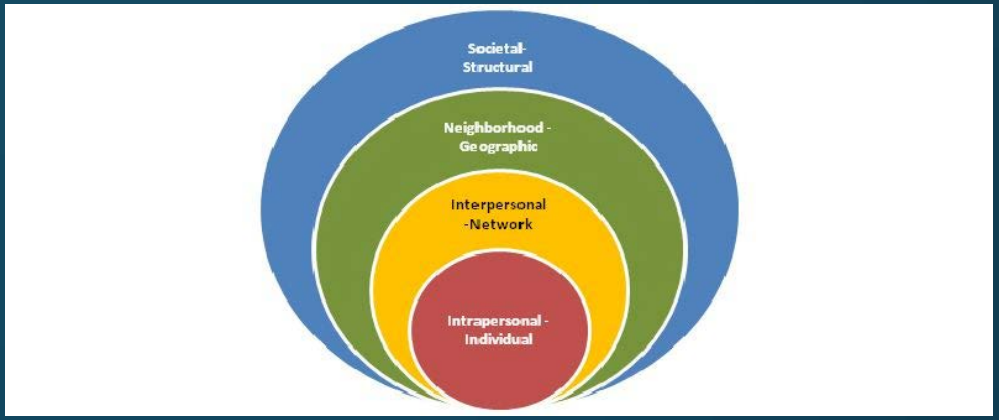
http://thumbs.dreamstime.com/x/economics-tags-cloud-17240736.jpg

Economics

- **Farm financials**
  - Operating income (revenue/cost/profit considerations)
  - Tax implications
  - Balance sheet impacts
- **Farm family goals**
  - Other economic goals (off-farm labor, other enterprises) – facilitating or limiting these options?
  - Non-economic goals (can you value these to evaluate them?)
- **Farm future** (opening up options)
- **Farm risks** (reducing or increasing)

OUTCOMES

Social



W.T. Robinson. 2013. DOI: 10.5772/55472

- **Non-Economic Goals**
  - Quality of life, labor experience, stress, health, well-being
- **Compatibility**
  - With labor, equipment, skills, interest of farmer
- **Learning curves**
- **Social Acceptability**
  - Overcoming doubts or skepticism
  - Responses of family, friends, neighbors
  - Community benefits

BROADER ISSUES

Pay Attention to (and Write About):

- **What helped this farmer succeed?**
  - Role of support networks, social and institutional context
- **What challenges encountered?**
  - How overcome?
- **Unexpected or unintended consequences**
- **Representativeness**
  - What kinds of farms in your area could best learn from experience of this farmer?
  - What aspects of this case are generalizable to other areas?

Pause…

- *Questions on material to this point?*

EXAMPLES (from the internet)

Part of NSW Department of Primary Industries

SEARCH CONTACT US

PRIMARY INDUSTRIES
Agriculture

NSW GOVERNMENT

Home » Agriculture » Farm management » Conservation farming »

Conservation farming case studies

On-ground implementation of conservation farming: an initiative of NSW DPI, the former Central West Catchment Management Authority (now Local Land Services) and the Central West Conservation Farming Association.

When adopting conservation farming practices a number of questions are raised by farmers. Questions generally focus on machinery requirements for crop establishement, stubble management and on the role of livestock in no-tillage systems. To help farmers answer these questions, NSW DPI in partnership with the former Central West CMA and the Central West Conservation Farming Association have developed a series of case studies that demonstrate adoption of conservation farming practices for different farm businesses.

For further information contact your District Agronomist.

Download

The Bowman family - *The Bowery*, near Coolah, NSW	144.6 KB
Jack & Dione Carter - *Innaminna*, Nyngan, NSW	166.8 KB
Peter & Christine Conn - *Hillview*, near Wellington, NSW	98.5 KB
Graham, Helen & Garry Day - *Bellevue*, near Molong, NSW	135.1 KB
Justin & Toni Fuller - *Tarawonga*, near Gilgandra, NSW	151.5 KB
Michael & Fiona Job - *Gunningbar*, near Warren, NSW	99.4 KB

http://www.dpi.nsw.gov.au/agriculture/farm/conservation/case-studies/on-ground-implementation

20 Case Studies

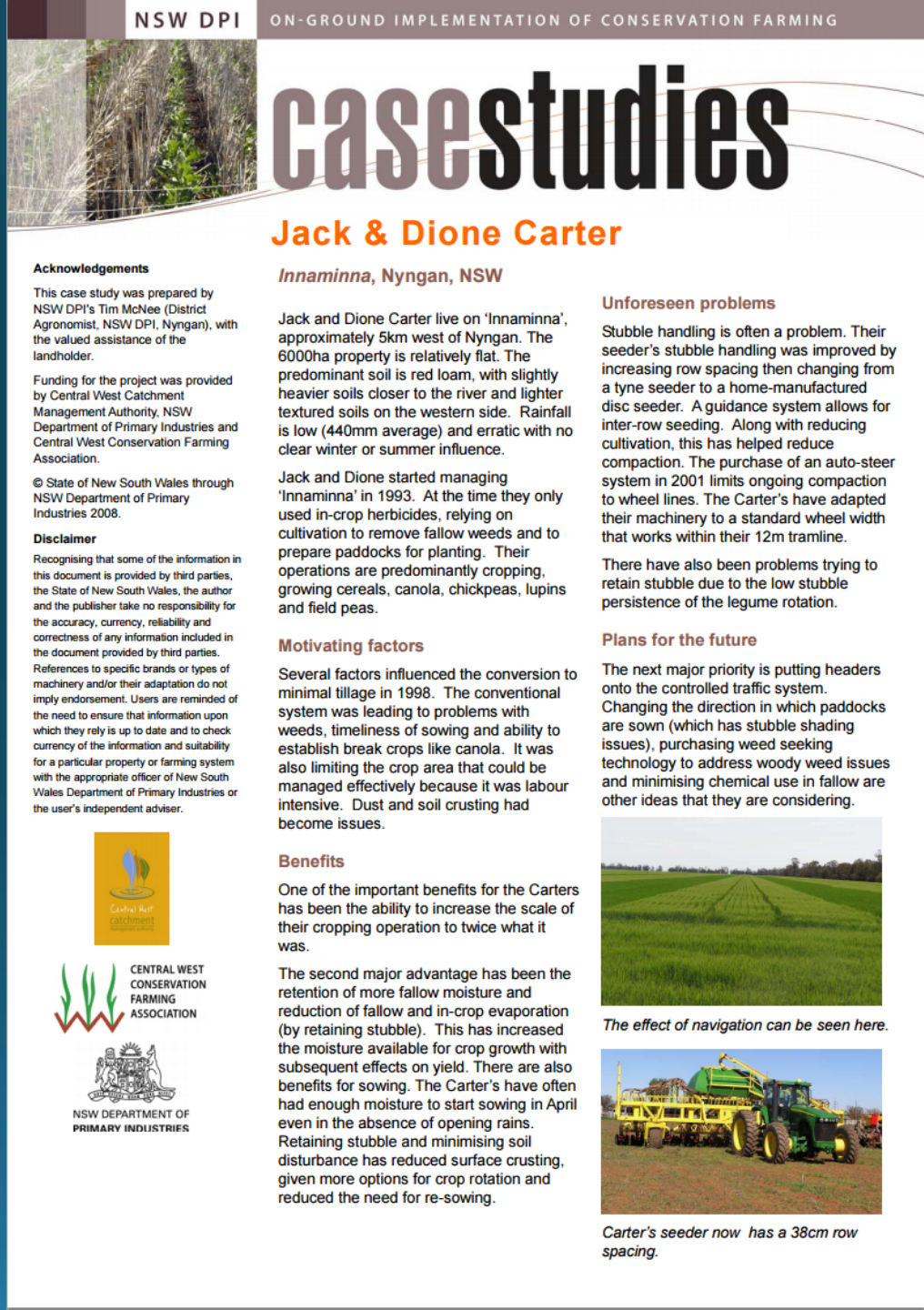
LENGTH: 1-page

CONTENT:

- Description
- Motivating factors
- Benefits
- Unforeseen problems
- Plans for future

Strengths:

- Short
- Balanced (not just promotional)
- Visual



NSW DPI ON-GROUND IMPLEMENTATION OF CONSERVATION FARMING

casestudies

Jack & Dione Carter

***Innaminna*, Nyngan, NSW**

Acknowledgements

This case study was prepared by NSW DPI's Tim McNee (District Agronomist, NSW DPI, Nyngan), with the valued assistance of the landholder.

Funding for the project was provided by Central West Catchment Management Authority, NSW Department of Primary Industries and Central West Conservation Farming Association.

Central West catchment

CENTRAL WEST CONSERVATION FARMING ASSOCIATION

NSW DEPARTMENT OF PRIMARY INDUSTRIES

Jack and Dione Carter live on 'Innaminna', approximately 5km west of Nyngan. The 6000ha property is relatively flat. The predominant soil is red loam, with slightly heavier soils closer to the river and lighter textured soils on the western side. Rainfall is low (440mm average) and erratic with no clear winter or summer influence.

Jack and Dione started managing 'Innaminna' in 1993. At the time they only used in-crop herbicides, relying on cultivation to remove fallow weeds and to prepare paddocks for planting. Their operations are predominantly cropping, growing cereals, canola, chickpeas, lupins and field peas.

Motivating factors

Several factors influenced the conversion to minimal tillage in 1998. The conventional system was leading to problems with weeds, timeliness of sowing and ability to establish break crops like canola. It was also limiting the crop area that could be managed effectively because it was labour intensive. Dust and soil crusting had become issues.

Benefits

One of the important benefits for the Carters has been the ability to increase the scale of their cropping operation to twice what it was.

The second major advantage has been the retention of more fallow moisture and reduction of fallow and in-crop evaporation (by retaining stubble). This has increased the moisture available for crop growth with subsequent effects on yield. There are also benefits for sowing. The Carter's have often had enough moisture to start sowing in April even in the absence of opening rains. Retaining stubble and minimising soil disturbance has reduced surface crusting, given more options for crop rotation and reduced the need for re-sowing.

Unforeseen problems

Stubble handling is often a problem. Their seeder's stubble handling was improved by increasing row spacing then changing from a tyne seeder to a home-manufactured disc seeder. A guidance system allows for inter-row seeding. Along with reducing cultivation, this has helped reduce compaction. The purchase of an auto-steer system in 2001 limits ongoing compaction to wheel lines. The Carter's have adapted their machinery to a standard wheel width that works within their 12m tramline.

There have also been problems trying to retain stubble due to the low stubble persistence of the legume rotation.

Plans for the future

The next major priority is putting headers onto the controlled traffic system. Changing the direction in which paddocks are sown (which has stubble shading issues), purchasing weed seeking technology to address woody weed issues and minimising chemical use in fallow are other ideas that they are considering.

The effect of navigation can be seen here.

Carter's seeder now has a 38cm row spacing.

search this website...

SoilsForLife
AN OUTCOMES AUSTRALIA PROJECT

CONNECT WITH US

About Us | Projects | Regenerative Practices | Resource Centre | News

REGENERATIVE AGRICULTURE CASE STUDIES
landscape regeneration in practice

Tweet Like Share

These case studies are the product of the:
- ***Innovations for Regenerative Landscape Management Project***
- ***Western Division Resilient Landscapes Project***

Learning from those who are successfully practising regenerative landscape management and encouraging wide adoption of these practices.

You can download the full Soils for Life Report *Innovations for Regenerative Landscape Management* and the full set of case studies, or order a hard copy of the Report on our Publications page.

http://www.soilsforlife.org.au/case-studies.html

Please provide us feedback via the form below on where you are from and how you use the information in these case studies. As a research and information organisation this would greatly help us to provide the most useful case study content to facilitate the adoption of regenerative landscape mangement practices. Thank you.

22 CASE STUDIES

GUNNINGRAH

Anne and Charlie Maslin

READ CASE STUDY

Watch a clip of this story

20km north west of Bombala, NSW Southern Tablelands

'Shifting mindset from animals to the land'

Enterprise: Angus beef, sheep and goat meat production and medium wool Merinos on 4200 hectares

Motivation for Change: Ecological deterioration and dependence on rainfall for profit

Innovations: Managing landscape to better capture rainfall, constructing leaky weirs across creeks and gullies; time-controlled planned grazing matching stock numbers to land carrying capacity; introducing goats for weed control

Practices Commenced: 1995

INVERARAY DOWNS

Cam McKellar

READ CASE STUDY

10km south of Spring Ridge, NSW North West Slopes and Plains

'Higher quality food through regenerated soils and reduced inputs'

Enterprise: Irrigated grain, seed and legume crops, cattle agistment and organic compost production on 1250 hectares

Motivation for Change: Prohibitively high-input crop production system

Innovations: Changing crop rotation to better support soil biology; changing from inorganic to organic fertilisers; application of compost fertiliser to increase soil organic matter; integrating grazing with cropping. Regenerating soil structure and nutrient dynamics to produce healthier food with reduced inputs

Practices Commenced: 2000

FARM FACTS

20 km north-west of Bombala, NSW Southern Tablelands

ENTERPRISE: Cattle, sheep, goats. Angus beef, sheep and goat meat production; medium wool Merinos

PROPERTY SIZE: 4200 hectares

AVERAGE ANNUAL RAINFALL: 550 mm

ELEVATION: 800-1000 m

MOTIVATION FOR CHANGE

- Ecological deterioration and dependence on rainfall for profit

INNOVATIONS

- Constructing leaky weirs across creeks and gullies
- Time-controlled rotational grazing matching stock numbers to land carrying capacity
- Introducing goats for weed control
- *Innovations commenced: 1995*

KEY RESULTS

- Increased profit stability – even with decreased rainfall
- Labour inputs reduced by 40%, providing increased time to pursue other activities
- Healing erosion gullies
- Greater water retention in pastures
- Flexible stock management

DETAILED CONTENT

- Introduction
- Farm Profile
- Motivating problem, process of change
- Details on each practice
- OUTCOMES
  - Environmental
  - Economic
  - Social (labor)
- Discussion of factors influencing success, generalizability

FORMATS

- Text, pictures, graphs
- Downloadable report
- Videos

STRENGTHS

- Suite of case studies
- Different
  - Levels of detail
  - Formats

FARMER TO FARMER CASE STUDIES

REACCH
Regional Approaches to Climate Change - Pacific Northwest Agriculture

Username Password Sign In User Management

Home | What's New | About | Mission | Resources

The Impact of Climate Change on Soil Erosion

31 Mar, 2015| by erichs
The sensitivity of soil erosion to climate change …

Congratulations to Paige Farrell

10 Mar, 2015| by erichs
Paige Farrell earned her Masters of Science with a…

Capital Ag Press covers REACCH findings

23 Jan, 2015| by erichs
REACCH is featured prominently in a front page art…

Climate Change in Politics

22 Jan, 2015| by erichs
While REACCH continues its focus on regional susta…

Get this feed

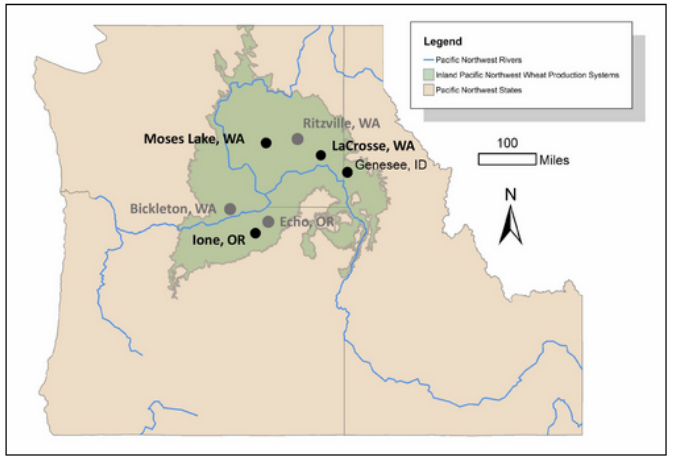
Farmer-to-Farmer Case Study Series

Increasing resilience among cereal-based farmers in the Inland Pacific Northwest

Abundant natural resources and an amenable climate allow for diverse agricultural opportunities in the inland Pacific Northwest, but the same environment also poses risks.

Farmers often adapt to low rainfall, highly erodible or shallow soils, fluctuating markets, production costs, and environmental concerns related to on-farm inputs. Some of these concerns are unique to a specific location, while others are universal to agriculture, but farmers have been able to farm successfully despite these challenges.

By adapting farming practices such as tillage, residue management, crop rotations, soil organic amendments and resource use efficiency farmers have been able to overcome specific barriers, often in unexpected ways. Innovative approaches used by inland Pacific Northwest cereal farmers to improve on-farm sustainability and longevity are being featured in a series of case studies.



The goal of these case studies to inspire others to take management risks on their farms that can improve their overall sustainability and resiliency into the future. Future case studies are in progress and will focus on farmers who manage water in irrigated systems, tillage practices and residue management in unique ways.

https://www.reacchpna.org/mission/extension/reacch-case-studies/

ision Nitrogen Application: Eric Odberg

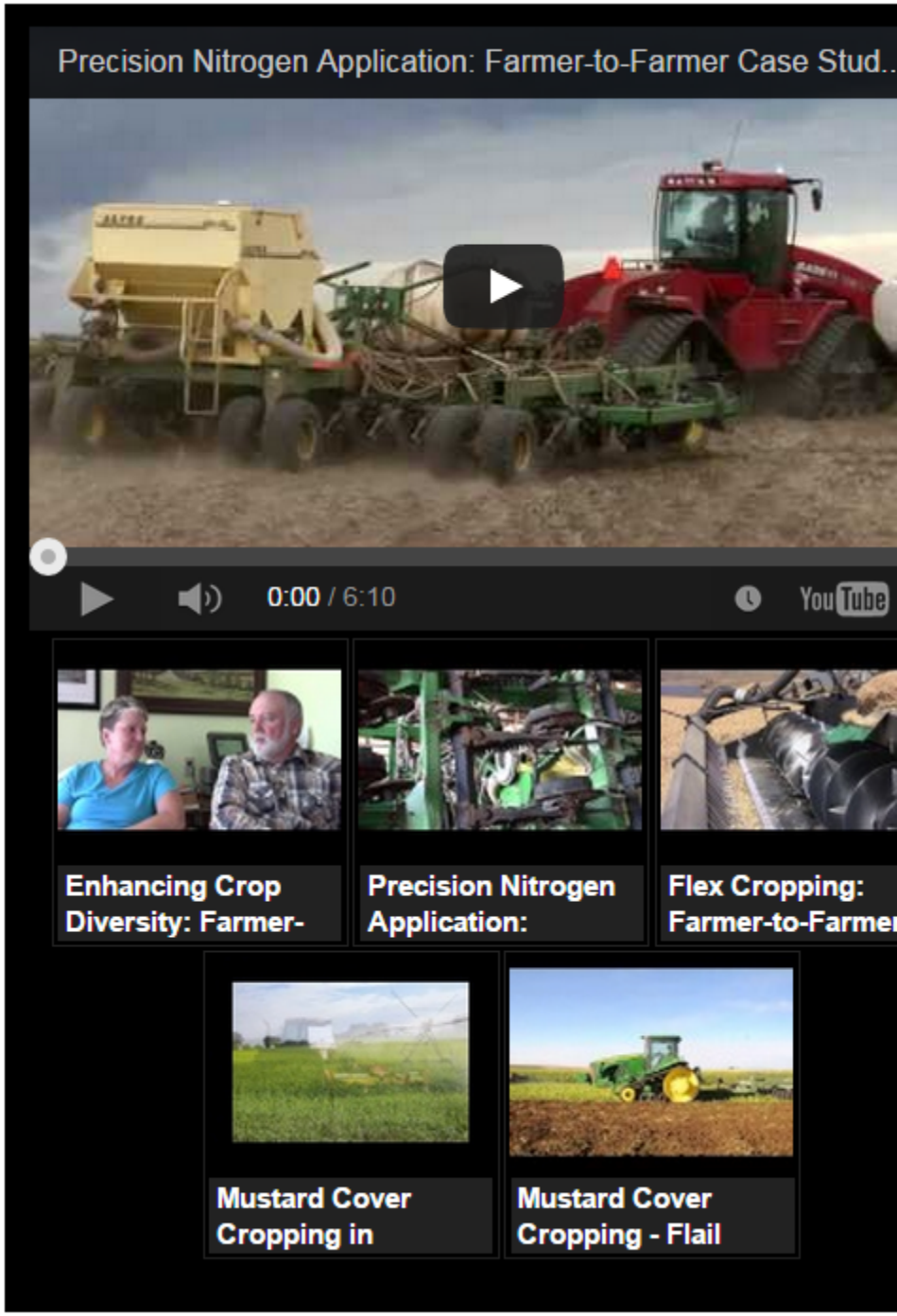
dberg is a fourth generation farmer who practices no-till gement and was an early adopter of variable rate nitrogen ation in the dryland production region of the Pacific vest.His farm is in Genessee, Idaho and received an l average of 22 inches of precipitation. He employs a 3-otation of winter wheat, pulses, and spring grain; and mental spring canola rotation.

ve built this case study illustrating Eric Odberg's use of ion nitrogen application in two parts:

- Watch the 6 minute video above introducing Eric Odberg and his production system.
- Read the Eric Odberg Case Study in one of three formats.
  - Visit Odberg's complete case study and video
  - Read it in an interactive pdf on-screen for easy-to-enlarge photos (not suitable for printing)
  - Choose conventional pdf to save on your machine or print to read on paper

ncing Crop Diversity: Steve and Becky p

cing Crop Diversity: Features a husband and wife team ave been able to improve soil health and moisture on by diversifying to a 4-5 year crop rotation utilizing ventional crops in a low-rainfall area in eastern WA. See at right for more information. Written case study will be ned here soon.



DETAILED CONTENT

- Introduction
- Farm profile
- Motivating problem
- Process – **learning, experimenting, adaptation**
- Details on practice (& equipment)
- Benefits
  - Production
  - Environmental
  - Economic
- Challenges
- Managing Risk
- New directions

STRENGTHS

- Visual
- Different layers of detail
- Explains complications, process
- Farmer voice

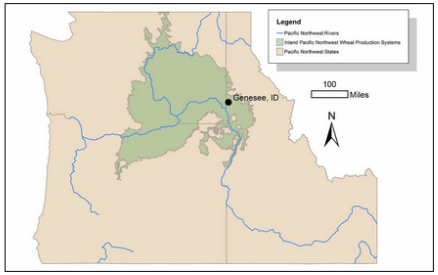
Eric Odberg is a fourth generation farmer who practices no-till management and was an early adopter of variable rate nitrogen (VRN) application in the dryland production region of the Pacific Northwest.

Throughout their years of farming, Odberg and his wife Malia have been motivated by the desire to pass along an environmentally and economically sustainable operation to their three sons. They currently farm about 2200 acres in a 3-year rotation of winter wheat, pulses, and spring grain. "I'm fourth generation, and hope to be able to hand it to the fifth generation. Having a sustainable farm is an important part of that. I want to have land to be able to farm, but also want it to be profitable."

Odberg sees VRN as just one strategy in his ongoing efforts to keep his operation profitable and to provide good stewardship for his land. "You're applying less nitrogen out there, which is better for the environment. You're not putting on excess, which would just go into the groundwater and into our rivers and streams. The direct seeding also helps with that, reducing the loss of topsoil and nutrients that are going into our waterways. So I really see them [working] hand in hand, with direct seeding being the foundation."

Case Study Profile

Location: Genesee, Idaho
Precipitation: 22 inches average
Cropping system: 3-year rotation of winter wheat, pulses (including lentils and several types of garbanzos), and spring grain (wheat or barley); experimental spring canola rotation



Above: Genesee, Idaho is in the annual cropping zone.
Right: Odberg views direct seeding as the foundation required for applying nitrogen at a variable rate among his cereal crops. View Odberg's video for the full picture of his production process and farm.

Getting Started with Variable Rate N

Odberg's journey to VRN began long before he actually tried it, starting with his transition to direct seeding in 2000, a few years after he took over the management of his family's farm (Figure 1). "I had a couple of big erosion events when I first started farming, and I could see that wasn't going to be sustainable and that we needed to change. And direct seeding was a good solution to that." Direct seeding led Odberg to adopt a series of additional new practices, including diversifying his rotations, growing multiple classes of wheat, and applying nitrogen (N) at variable rates.

Figure 1. As a no-till farmer, Eric Odberg seeds directly into residues such as his previous garbanzo crop.

Odberg first began experimenting with precision agriculture in 2005, when he purchased an Exactrix anhydrous fertilizer delivery system for his no-till drill, seeking to improve the evenness of his N applications and reduce overall N use (see sidebar, "Odberg's Equipment"). By keeping the pressure higher than most other application systems, the Exactrix system maintains anhydrous ammonia as a liquid as it is injected into the soil, reducing gaseous losses of ammonia compared to many other systems. As Odberg looked for strategies that would further reduce N fertilizer use, Guy Swanson, a mentor and the owner of Exactrix Global Systems, suggested that he try VRN application. Instead of applying N at the same rate across the field, based on average yields, he could probably reduce N applications on his hilltops, where the soil was thinner and production was lower (Figure 2).

KNOW YOUR FARMER KNOW YOUR FOOD COMPASS

CASE STUDIES

Navigation

Good Growing in Oklahoma, Year Round

A sweet, juicy watermelon is the perfect snack to dig into on a hot summer day. Even more perfect is bringing home a fresh one from a local farmers market or farm stand. What if you could have that same sweet experience when school starts, and have it delivered fresh from the farm to your school cafeteria? **Read more...**

In San Diego, a Project that Starts with Culture Leads to Economic Opportunity

In 1975, the International Rescue Committee opened an office in San Diego focused on refugee resettlement. Three decades later, the group launched a new program to help its clients, many of whom came from agricultural areas or backgrounds, establish "new roots" in their adoptive home country. **Read more...**

On an Island in San Francisco Bay, Local Food Creates Jobs

Around the country, communities are talking about how strong regional food systems can create jobs. At the Treasure Island Job Corps Center, committed staff and excited students are proving these communities right. **Read more...**

Calling Local Meat Processors: USDA is Here to Help

What do you get when you combine a reference librarian, a garage, and the Small Plant Help Desk of USDA's Food Safety Inspection Service? You get Link Lab Artisan Meats, a successful small business

USDA KYF Case Studies

- Brief profiles of success stories
- Little detail on outcomes
- No discussion of complications
- No links to additional resources
- Not really aimed at farmers

CASE STUDY

A New Business Model Proves Lucrative for Grass-Based Dairies

A New Business Model Proves Lucrative for Grass-Based Dairies

In New York, consumer interest is driving demand for local food products, even while the number of farms is shrinking. When Becca Jablonski began a project to support dairy farmers in New York, the price of milk was $11.83 per hundredweight, well below the cost of production.

But Jablonsky was familiar with the research showing that consumer demand for local foods is strong - research like a recent study from the Grocery Manufacturers Association, which found that 85 percent of consumers chose their grocery store in part based on whether it stocked food from local farms.

She knew that it takes agility, technical support, and money to respond to changes in the marketplace. So Jablonsky sought funding from USDAs Sustainable Agriculture Research and Education (SARE) program to figure out a workable way to tap into this demand and help New York dairy producers. The result was the establishment of **Kriemhild Dairy Farms, L.L.C** (KDF), a company with four member farms and two more Amish farms as affiliate contractors. They came together with the shared goal of developing a line of branded grass-based dairy products; agreements are now in place with Queensboro Farm Products, Inc. to process KDFs first consumer offering, butter. Three local food distributors and a grocery store chain have agreed to carry KDFs butter, and the company is now positioned to take advantage of this emerging market.

Another result has been remarkable project momentum and leveraged money-KDF was recently awarded a $17,000 USDA Value-Added grant and also got $5,000 through a private donation. The new company now has all the funding needed to test, package, and launch the grass-based butter.

Soil Conservation Service

Exhibit 1
Conservation Effects Worksheet

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

Resource Setting:
Blount-Morley soils, moderately sloping

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

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

Meets Resource Management System Criteria

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

Actions (Kinds, Amounts, 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	--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	--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	(+) Better root development
		--Slower planting	(-)
		--Need more time for scouting	(-)
		--Chemical use increased	(-) Burn-down herbicide needed
Beans: --Plow in the fall --Disk twice --Plant and spray Turbo --Double back for 15" rows --Rotary hoe	--Chemicals: Corn: Lariat .88 gal/ac Banvel 1/4 pt/ac Beans: Turbo 1 qt/ac Wheat: None	--Fertilizer requirements unchanged but timing of application is closer to when crop needs nutrients	(+) Better utilization of nutrients
Wheat in Bean Stubble: --Disk once --Drill wheat	--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 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	(+) Can use this time for scouting and more time for livestock
		Beans 3.3 hrs/ac	(+)
		Wheat 0.8 hrs/ac	(+)
	--Fuel: Corn 8.3 gal/ac Beans 7.0 gal/ac Wheat 5.5 gal/ac	--Yields will be maintained	(+)
	--Labor: Corn 9.8 hrs/ac Beans 8.8 hrs/ac Wheat 5.0 hrs/ac	--1/2 acre less cropland	(-)
	--Yields: (expect to decline over time) Corn 143 bu/ac Beans 42 bu/ac Wheat 60 bu/ac	--1/2 acre more wildlife nesting habitat	(+)

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.

Case Study - Conservation Effects

Type of Operation and Location: Pasture - Dairy - Southeast Ohio

Resource Setting:	**Resource Problem(s):**	**Benchmark System:**
160 cow/heifer dairy on rolling to steep well drained soils. Cropland and pasture.	Shortage of summer pasture for heifers and cows. High labor requirements	Good soil testing and fertility program, mulch tillage C-C-W-4yr Alfalfa, manure storage for 3 months.
Client Objective(s): Reduce labor requirements, improve herd health, increase grazing, reduce field crops, have more free time.		**Planned Treatment System:** • Planned grazing and watering system; no till crop production (C-C-W- 4yrs pasture), nutrient management, pest management, manure storage. Meets Resource Management System Criteria

Comparison of Effects of Benchmark and Treatment Option

Actions Before Treatment (Kinds, Amounts, Timing of the benchmark system)	**Effects Before Treatment** (Effects of continuing the benchmark system)	**Impacts After Treatment** (Change from the before treatment to the applied treatment)	**Decisionmaker Evaluation** (+) Feels Positive about the change (-) Feels a drawback about change
Cropland: 300 acres of C-C-W-4yr Alfalfa. Most hay is made into haylage. 20% of corn is for silage. 3 tillage trips required to plant corn. Contour strips are established.	• Adequate feed is available • Very labor intensive • Shortage of summer pasture • Shortage of winter manure storage - poor hauling conditions in winter. • Soil erosion is at tolerable levels. • Good crop yields • Heifer and cow health problems when confined.	• Installed a fencing system $3,500 • Installed a watering system $2,000 • Fertilizer reduced by 50% • Erosion reduced by 2 tons/ac/yr • Same manure storage now holds 6 months storage. • Herd health improved • Labor reduced by $20,000/yr • Labor to move fence twice daily • Reduced time for hay making • Only silage is corn and is put in silo • Intensive grazing offers fast regrowth and quality forage. • Cows are cleaner • Less time required in the parlor • Reduced equipment cost and maintenance. • Net profit increased (Cows on pasture 6 months, heifers on pasture for most of 12 months)	• (-) but good investment • (-) but good investment • (+) • (+) • (+) • (+) • (+) • (-) • (+) • (+) • (+) • (+) • (+) • (+) • (+) • (+)
Livestock: 80 cows in feed and 80 heifers on pasture for 6 months.			
Manure Storage and Handling: Manure scraped daily into semi-solid structure and hauled when time is available and conditions fit. During winter months only holds about 2 months storage.			
Nutrient Management: Soil tests are taken on a regular basis and fertilized per OSUE.			
Pest Management: Scouts, uses IPM			

Natural Resources Conservation Service

Michigan

Residue Management

Conservation Treatment Effects-Cropland (MI)

The purpose of Residue Management as a conservation treatment is to manage the amount, orientation, and distribution of crop and other land residue on the soil surface year-round while growing crops in previous crop residue. It can be applied as part of a conservation management system to:

- Reduce soil erosion.
- Improve plant health.
- Improve soil quality.
- Provide benefits to wildlife.

Resource Setting:
Soil Type: Major soils are in the Capac-Marlette-Colwood Association, which are characterized as nearly level to undulating, well drained to somewhat poorly drained loamy soil. Critical soil erosion areas contribute to decreases in water quality in local streams by adding sediments, nutrients and pesticides. This farm had erosion rates of 6 to 9 tons per acre per year.

Solution: Residue Management, No-Till (329A) and supporting practices.

Transition from Conventional tillage to Residue Management, No-till:

- Machinery Transition Costs
  A farm with older, depreciated machinery will have a lower impact on capital to sell conventional equipment and purchase no-till machinery. Selling machinery that is newer or has high debt on it will have a larger impact on the farm's capital. The farm may have capital losses on the equipment changes.
- Time Lag for yield response
  In the first year of the practice, yields were especially low. It took three years to get yields back up to normal.
- Night Crawlers as an indicator
  Conventional tillage practices decrease the lignin content of soil and therefore organic matter content. The number of worms present in soil decreases with the use of chemicals, such as atrazine, and the amount of organic matter or food. The farmer in this study used night crawlers as an indicator of soil condition. Since the residue management practice was started, the number of worms has grown exponentially. Worms aid in the turnover of organic material, increase infiltration of water, cycle nutrients, and increase the drainage, aeration, structure and air space of the soil.

For more information on this conservation treatment, contact your local NRCS Service Center.
On the web, find your local Service Center at: http://www.nrcs.usda.gov

Conservation Treatment Effects

Mid-Michigan Cropland Convention tillage to Residue Management

Resource Setting- Family-owned farm, Cash Crop
Crop Rotation: 1-2 year corn, 1 year soybeans, 1 year wheat (subject to market conditions)

CONSERVATION TREATMENT:	RESOURCE ISSUES:
• Residue Management, No-till-(329A) • Conservation Crop Rotation-(328) • Critical Area Planting-(342) • Grade Stabilization Structures-(410) • Subsurface Drain-(606) • Nutrient Management-(590) • Pest Management-(595)	Wind erosion, water erosion, sheet, rill and gully erosion, weed control, low crop yields, surface and ground water concerns, soil compaction, low soil fertility and organic matter content, subsurface drainage
POSITIVE EFFECTS +	**NEGATIVE EFFECTS -**
+ **Reduced Soil erosion** • Decreased to 2 tons/acre/year + **Improved soil quality:** • Increase in soil fertility • Increased soil organic matter content by 2% • Increased water holding capacity and water infiltration rates of the soil • Increased carbon dioxide in soil, aided to a change in plant bio-mass • Reduced soil compaction • Reduced soil crusting • Increased number of night crawlers • Improve yield in drought years. + **Improved water quality** • Reduced sedimentation up to 7 tons/ac/yr + **Sustained soil tilth and crop production resulted in increased yields on average.** • Corn from 100 to 150 bu/yr. • Soybeans from 25 to 45 bu/yr. • Wheat from 50 to 100 bu/yr. + **Reduced equipment and labor needed** • **at most,** 3 trips with the equipment is needed + **Reduced pesticide use** • Discontinued and replaced atrazine from 4lbs/ac/yr to 0 • Saved approx. $50 lbs/ac/yr	- **Reduction in crop yields at start of practice** • 3-year lag to get yields back up to normal or above • $ loss of income with low yields, especially in the first year - **Social pressure at the start of the practice because no-till was not well received in 1988** - **Increased cost for Grade Stabilization Structures and other practices** - **Machine Transition Costs to purchase and outfit no-till equipment** • Purchase price + cost to modify a no-till planter is $500 to $600 a row • Started with 6 rows; now has 8 rows after modification • This was a minor negative for this farm. Machinery expenses may be higher depending on types of equipment selected.

Prepared by Cristin Popelier, Economist Trainee USDA-NRCS (MI) Last Update: 5/13/02

NOBODYS PERFECT: Potential Limitations of Case Studies

- Lack of rigor in measuring outcomes
- Profiles of the "Unusual"
  - Outstanding producers
  - Exceptional outcomes
- Transferability of results?
  - Actual results may vary…
- Format & media for dissemination

SUMMARY

- **Case studies have multiple purposes**
  - Outreach tool = focus today
  - KEY: be compelling, credible, and rely on land managers/farmers as authorities
- **Credibility depends on good selection of case study farmers, balanced presentation**
  - Representativeness
  - Diversity
  - Accurate portrayal of benefits & challenges

SUMMARY

- **Context Matters**
  - Describe: Who, What, When, and Where
  - Also Why - motivations may be unrelated to outcomes
  - Recognize importance of social & institutional context
- **Consider Multiple Outcomes**
  - Farm production
  - Environment
  - Economics (Farm & Family; Income & Wealth; Risk)
  - Social Aspects
- **Draw on Effective Case Study Examples/Resources**
  - **CONTENT:** Realistic, pros & cons, process
  - **FORMAT:** farmer voices/faces, multi-media, updated, and interactive

QUESTIONS?

CONTACT INFORMATION

Dr. Douglas Jackson-Smith
doug.jackson-smith@usu.edu

Dr. Bradford Barham
bradford.barham@wisc.edu