



Organic Grain Production

Research and Best Practices

Joel Gruver – j-gruver@wiu.edu



What is organic agriculture???



Permanent Agriculture: Precursor to Organic Farming

John Paull

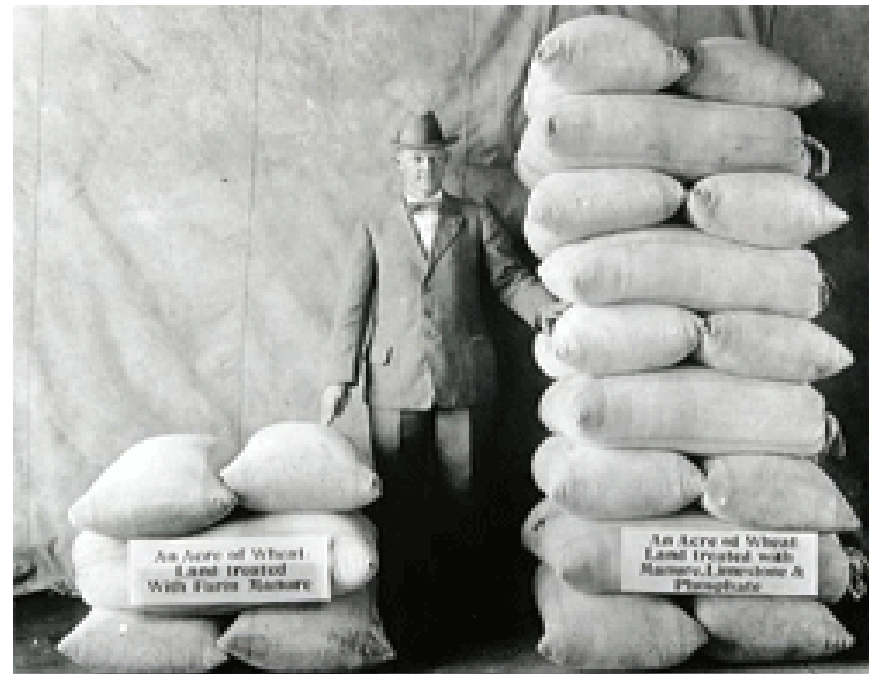
School of Geography and Environmental Studies, University of Tasmania

A century ago, the pre-eminent American soil scientist of his day wrote an eyewitness account of what he called *permanent agriculture*. Franklin Hiram King was recently retired as Professor of Agricultural Physics at the University of Wisconsin, when he embarked on a journey to the East. The resulting book, *Farmers of Forty Centuries, or Permanent Agriculture in China, Korea and Japan*, (1911), has been described by the founder of Organic Agriculture as a “classic” which “no student of farming or social science can afford to ignore” (Northbourne, 1940, p. 17, p. 55).

Permanent Agriculture is a concept that predates Bio-dynamic and Organic Agriculture, and like them, was, in part, a response to governmental agricultural orthodoxy. Shulman (1999) comments that early in the twentieth century, “Existing institutions, such as the United States Department of Agriculture, were not considered adequate guardians of the food supply” (p. 401).

SOIL FERTILITY AND **PERMANENT** AGRICULTURE

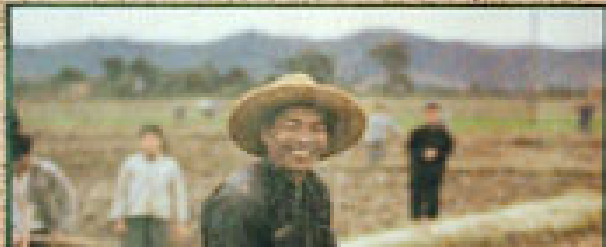
Why didn't
Dr. Hopkins
recommend K
fertilizer?



CYRIL G. HOPKINS, Ph.D.

**PROFESSOR OF AGRONOMY IN THE UNIVERSITY OF ILLINOIS, CHIEF IN
AGRONOMY AND CHEMISTRY AND VICE DIRECTOR OF THE
ILLINOIS AGRICULTURAL EXPERIMENT STATION**

Farmers of **FORTY CENTURIES**



*Farmers of 40 Centuries:
Permanent Agriculture in
China, Korea and Japan
was the original title.*



by
F. H. King

Franklin Hiram King

(1848-1911)

**FH King , Professor of Soil
Physics at UW was
dismayed by the rapid
degradation of Midwest
soils during the 19th century
and traveled to Asia looking
for answers.**

*“ We desired to learn how it is
possible, after twenty and
perhaps thirty or even forty
centuries, for their soils to be
made to produce sufficiently
for the maintenance of such
dense populations.. “*

*Farmers of Forty Centuries,
1911*

CONSERVATION
CLASSICS

TREE CROPS

A **PERMANENT**
AGRICULTURE

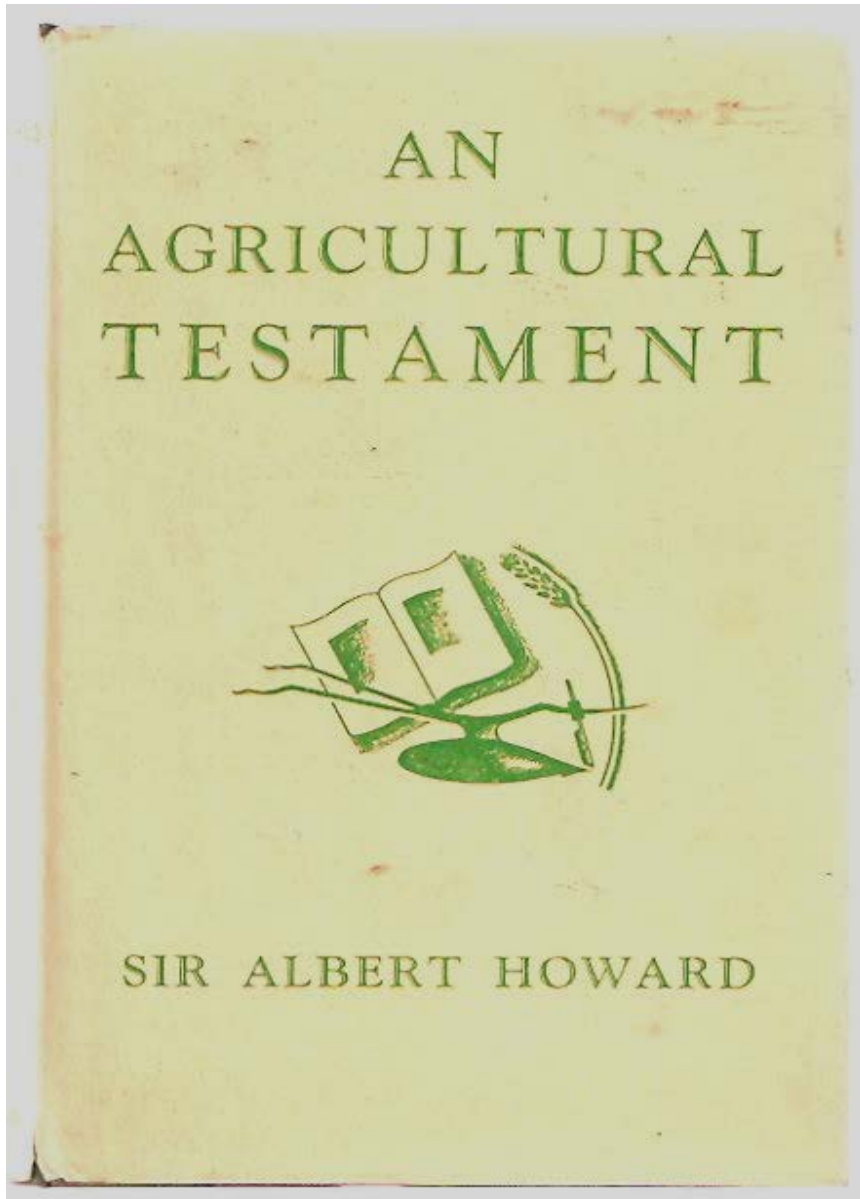
by
J. Russell Smith

First edition
in **1929**

Introduction by
Wendell Berry



JR Smith was a pioneer in the field of economic geography, an author of many popular elementary school – college level geography text books and a dedicated conservationist and agro-forester.



In *An Agricultural Testament* (1940) Howard laid out his vision for agriculture based on nature as a model with great emphasis on a concept that is central to organic farming--the importance of utilizing organic waste materials to build soil organic matter and maintain soil fertility.

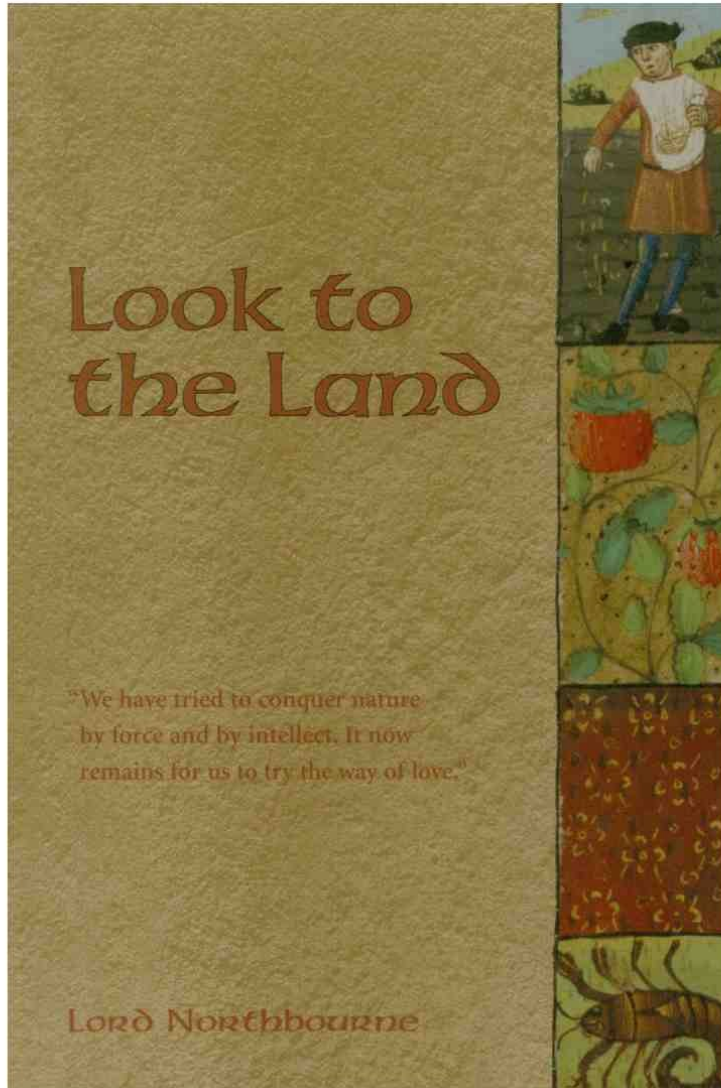
An Agricultural Testament

by Sir Albert Howard

Chapter 1

Introduction

*THE maintenance of the fertility of the soil is the first condition of any **permanent** system of agriculture. In the ordinary processes of crop production fertility is steadily lost: its continuous restoration by means of manuring and soil management is therefore imperative.*

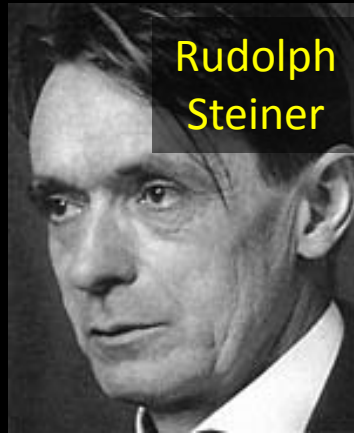


In 1940, Northbourne introduced his concept of the ideal *farm as an ORGANIC whole* (i.e. having a complex interrelationship of parts/organs, similar to that in living things) in a book titled, *Look to the Land*.

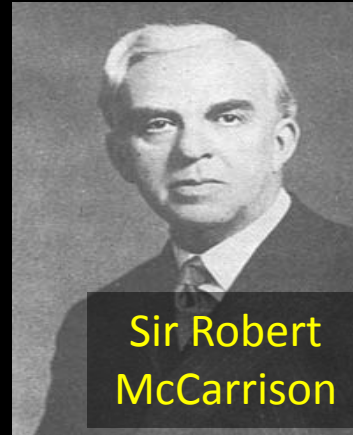
Jl Rodale's publications gave voice to the ideas of many other advocates for alternative health and farming practices



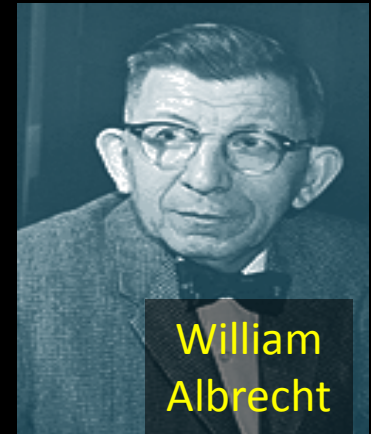
Lady Eve
Balfour



Rudolph
Steiner



Sir Robert
McCarrison



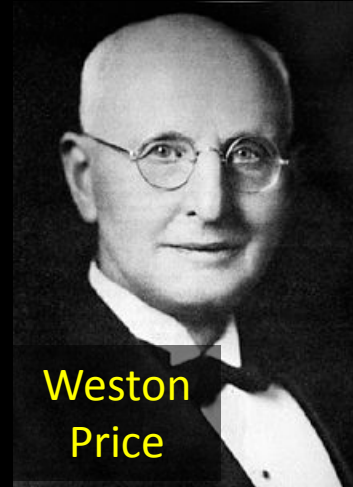
William
Albrecht



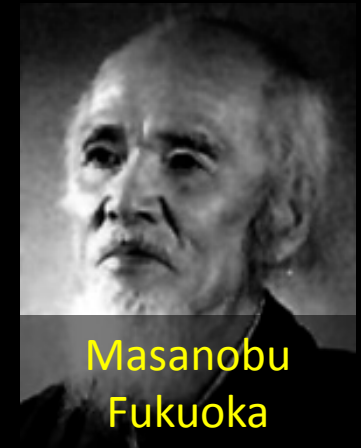
Louis
Bromfield



Ehrenfried
Pheiffer



Weston
Price



Masanobu
Fukuoka



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National Organic Program

Welcome to the National Organic Program



What is organic?

Organic is a labeling term that indicates that the food or other agricultural product has been produced through approved methods that integrate cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity. Synthetic fertilizers, sewage sludge, irradiation, and genetic engineering may not be used. [Consumer Information.](#)

Our Mission

Ensuring the integrity of USDA organic products in the U.S. and throughout the world. [About Us](#) | [USDA Organic Seal](#)

Organic Standards

Regulations and guidance on certification, production, handling, and labeling of USDA organic products. [Learn more.](#)

[Organic Regulations](#) | [Program Handbook](#) | [Draft Guidance](#)

[Rulemaking & Notices](#) | [National List & Petitioned](#)

Receive NOP Updates

- [Be an Organic Insider!](#)

General Information

- [Frequently Asked Questions \(FAQs\)](#)
- [2010-2012 Strategic Plan: 2011 Refresh \(PDF\)](#)
- [September 2012 Organic Integrity Quarterly Newsletter \(PDF\)](#)
- [Fact Sheets](#)
- [Public Correspondence](#)
- [NOP Job Openings](#)

Lists of allowed and prohibited materials

[§205.600](#)

Evaluation criteria for allowed and prohibited substances, methods, and ingredients.

[§205.601](#)

Synthetic substances allowed for use in organic crop production.

[§205.602](#)

Nonsynthetic substances prohibited for use in organic crop production.

[§205.603](#)

Synthetic substances allowed for use in organic livestock production.

[§205.604](#)

Nonsynthetic substances prohibited for use in organic livestock production.

[§205.605](#)

Nonagricultural (nonorganic) substances allowed as ingredients in or on processed products labeled as "organic" or "made with organic (specified ingredients or food group(s))."

[§205.606](#)

Nonorganically produced agricultural products allowed as ingredients in or on processed products labeled as "organic."

National Organic Program

USDA Accredited Certifying Agents (ACAs)

Producers and handlers may choose any Accredited Certifying Agent from the current lists below.

Number of domestic accredited certifying agents: 55

Number of foreign accredited certifying agents: 42

Total: 97

Domestic Accredited Certifying Agents:

Illinois



Go

Foreign Accredited Certifying Agents:

Select...



Go

See Also

- [Complete List of Domestic Accredited Certifying Agents \(PDF\)](#)
- [Complete List of Foreign Accredited Certifying Agents \(PDF\)](#)
- [State Organic Programs](#)

General Information

- [Organic Feedgrain Producers and Handlers](#)
- [Questions? See NOP-AQSS](#)

Midwest Organic Services Association, Inc

Certified Organic Operations

260 Acres
28812 Kittyhawk Ave
Kendall, WI 54638
United States
N/A
Fax: N/A
E-mail: N/A
Primary Certification: Crops

4ever Acres
50760 Haney Valley Rd
Gays Mills, WI 54631
United States
608-526-4647
Fax: 608-526-1032
E-mail: brulyn@centurytel.net
Primary Certification: Crops

A & P Jerseys
W4146 200th Ave
Maiden Rock,
United States
715-594-397
Fax: N/A
E-mail: N/A
Primary Certification: Crops

Aamon Martin
N 15533 Cty Hwy O
E-mail: N/A
Primary Certification: Crops

Aaron Hoover
N 13382 Cty Rd E
Colby, WI 54421
United States
715-223-6029
Fax: N/A
E-mail: ted@allstartrading.com
Primary Certification: Crops

Aaron Molter
7440 N Branch Road
Watervliet, MI 49098
United States
269-208-2904
Fax:
E-mail:
Primary Certification: Crops

You can look up the names and contact info for all the farms certified by each accredited certifier

Organic certification requirements

Detailed farm plan showing all fields/buffers

Documentation of all inputs

Documentation that equipment not solely used for organic has been cleaned properly

On-farm inspection

3 year transition

Mr. Andy Clayton
WIU School of Agriculture
145 Knoblauch Hall
Macomb, IL 1455

3rd party inspectors are hired by certifiers

Dear Andy:

As agreed I will be conducting your organic inspection on behalf of MOSA for Allison Organic Research Farm on Saturday, October 27, 2012, beginning at 9:00 a.m. I appreciate your being willing to meet with me on a Saturday.

I will need to see all aspects of your organic production - including all fields and buffers; documentation of the receiving of all inputs; input and seed application, harvest, storage, and sale of organic products; and cleaning procedures plus their documentation.

A key feature of the inspection will be an audit, where I can verify each of your inputs (their sources and quantities); the tracking/shipping of finished products; inventory tracking and sales. Please be aware that two audit trail exercises will be conducted, namely a trace-back audit of finished product to field and seed of production, and an in/out balance exercise to determine organic output vs. input.

Please be prepared to share the following information for your operation:

- ◆ **Changes to Organic System Plan** – although all deviations should have been addressed with the certifier prior to this audit, all changes made within the past year will be reviewed and discussed. The new fields added within the last year will be reviewed, including PLU (Prior Land Use) for 36 months of input history prior to harvest.
- ◆ **Seed documentation** – including current up-to-date organic certificates for suppliers of all organic seeds, planting stock, or transplants; OR documentation of commercial unavailability from at least three (3) recognized organic suppliers for each non-organic seed or planting stock variety in use. Please have seed tags and invoices available for inspection.

Long ley rotation – grazing livestock



There is more than 1 success strategy for organic grain production

Short rotation – imported manure



Well integrated crop-livestock systems have clear advantages but many organic grain farms do not use this approach



Short rotation – intensive livestock

Jack Erisman

Pana, IL

Summary of operation

2,500 acres – all organic

Red, white, yellow and blue corn, popcorn, soybeans, small grains & cover crop seed
250 head of cattle all organic grass and pasture fed.

Background

Jack grew up on his family operation, taking it over in 1963. Mr. Erisman is all about sustainability, ecological issues, and socially acceptable farming techniques. He has found a way to achieve all this and be profitable. Growing up, his father built up the farm by buying land no one else wanted and restoring its productivity. He eventually became one of the largest farmers in the area. The family farm is located in Christian County, Illinois, just south of where the glaciers deposited the best soils in Illinois. Jack always had dreamed of following in his father's footsteps. He attended parochial school in Springfield, Illinois, then at Jesuit boarding school in Wisconsin for a classical education including Latin, Greek, mathematics and science. For a while he considered the priesthood but ended up enrolling at St. Louis University to study Liberal Arts. He found he did not have any interest in the studies and returned to the farm for a short time before joining the Army. In the fall of 1961 he finished his stint in the army and enrolled at Colorado State University to study agricultural engineering. After college he ended up back home and farming. Jack made the decision to go organic on all the ground in 1990. (SNIP)



Soybeans drilled on 6" rows - >>200k with ~ 2 bushel of cereal rye

Q&A with Jonathan Olson - 2016

FARM OVERVIEW

How many acres of crops did you grow in 2015 and/or recent years if 2015 was a non-representative year?

We run 1100 acres of crops, aiming for a rotation of 1/3 small grain, 1/3 yellow corn and 1/3 soybeans. In 2016, I am putting in 80 acres of alfalfa following oats for a cash crop.

Describe non-crop land that you manage as an enterprise (e.g., pasture, woodlot..).



Most of our ditch banks have a buffer strip of CRP grass along them.



Blue Chip Investment

Organic blue corn puts grower in the black



Profile: Whilden Randall Hughes (Randy), 52 Janesville, Wis.

FAMILY: Wife, Judy; son, Whilden David (Willie), who attends the University of Iowa; daughter, Julianne, who will attend University of Wyoming. Neither child has expressed an interest in agriculture as a vocation, "But I work on them a little bit every day," Hughes says.

OPERATION: The total operation consists of 5,000 acres: 1,200 acres planted with organic corn, hay and soybeans; 1,000 acres, conventional soybeans; 2,500 acres, conventional corn; and 300 acres, canning crops. Hughes has six full-time employees and five to six seasonal employees.

BEST BUSINESS DECISION: Hiring full-time office manager Cathy Fishel who takes care of all accounting and field records and handles deliveries and visitors. "I think





Accredited Certifiers Association, Inc.

PO Box 472

Port Crane, NY 13833 USA

607.648.3259 *phone / fax*

www.accreditedcertifiers.org

certifiers@accreditedcertifiers.org

November 5, 2012

Miles McEvoy, Deputy Administrator
U.S. Department of Agriculture National Organic Program
1400 Independence Avenue, SW
Room 2646-So. (Stop 0268)
Washington, DC 20250

Dear Miles:

The Accredited Certifiers Association convened a Working Group to identify the issues of particular interest in the certification of parallel production of organic products. Accredited Certifying Agents certify a variety of production operations, including those that may produce certified organic, transitional and conventional products of the same variety at the same location. In our discussions it was noted that ACAs do provide additional scrutiny of **parallel production** operations in order to insure the integrity of the organic products.

What Drew Me to Organic?

- Less competition in organic
- New demand growing consistently
- More difficult to manage
- Regulated by NOP with high entry hurdles
- Price and yields conducive to profit
- Fewer international competitors in some products

Gary Reding,
Langeland Farms, Inc.

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Organic Crop Insurance Abuse Hides in Plain Sight

DECEMBER 9, 2016 09:00 AM



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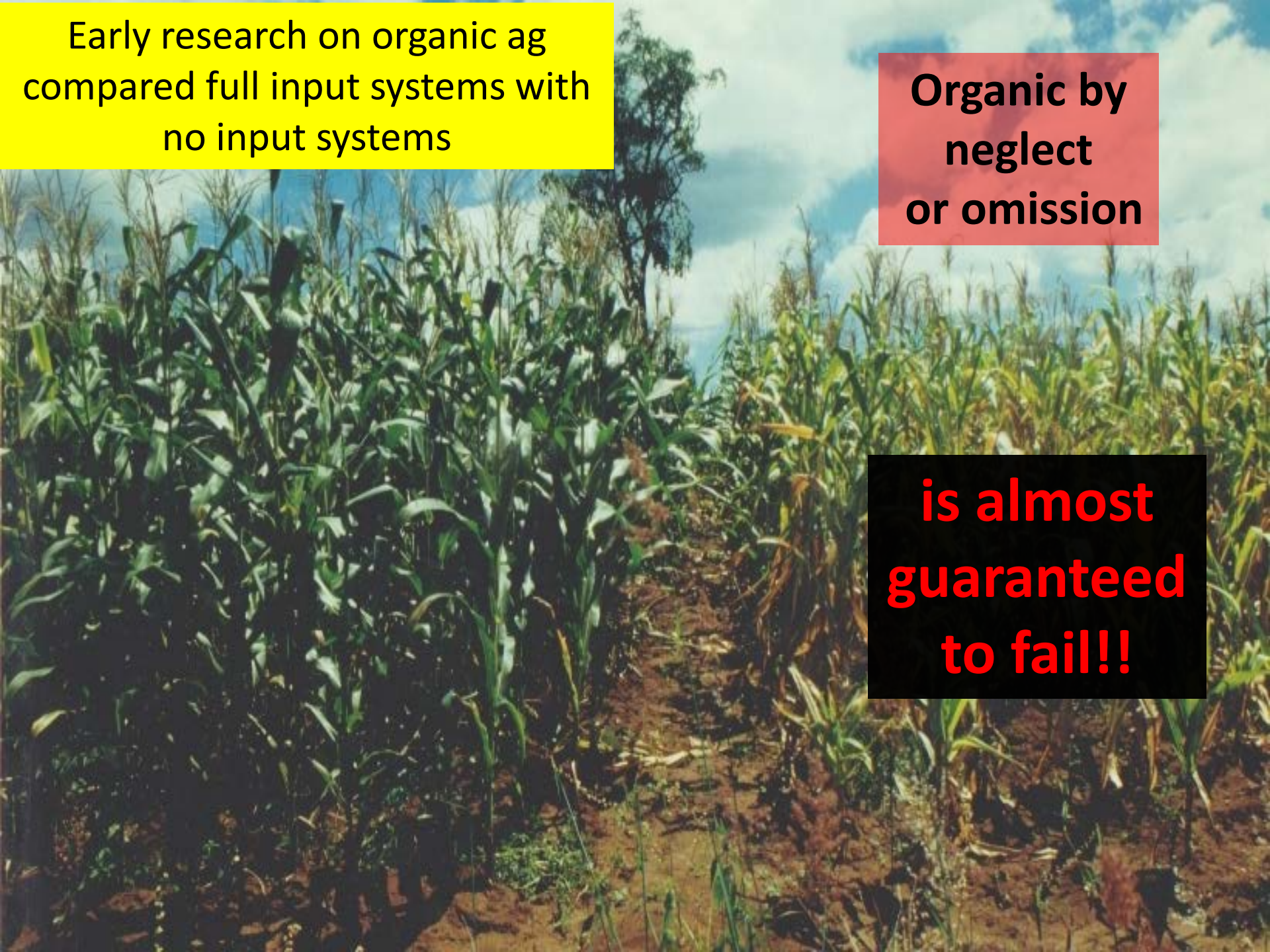
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Early research on organic ag
compared full input systems with
no input systems

**Organic by
neglect
or omission**

**is almost
guaranteed
to fail!!**



Organic Research Projects

All the reports below are PDF files. Please contact the School of Agriculture if problems occur when accessing these documents. We will provide site content in a format you can use.

Organic Fertilizers/Soil Amendments

- *Nature Safe*® 13-0-0 Organic Dry Fertilizer Study
- Organic Dry Blended Fertilizer Study
- Soybean Yield Response to Hog Manure Application
- SumaGrow Study
- Humate/Fertility Study
- Oat Yield Summary and Allganic® Nitrogen (16-0-0) Trial

Variety/Hybrid Trials

- 2015 Soybean Variety Trial at Conventional Site
- 2014 Soybean Variety Trials
- 2013 Soybean Trials (Yield Summary)
- 2012 Corn Hybrid Trial
- 2012 Soybean Trials (Yield Summary)
- 2011 Soybean Trials (Yield Summary)
- 2010 Soybean Trials (Yield Summary)
- 2009 Soybean Trials (yield summary)
- 2008 Soybean Trials (yield summary)
- 2007 Soybean Trials (yield summary)
- 2006 Organic Corn Hybrid Trials
- 2006 Soybean Variety Trials at Conventional and Organic Site

**Reports describing
some of our research
projects are available
on our website:**

<http://www.wiu.edu/cbt/agriculture/farms/organic/research.php>

Variety	Group	Company/ Source	Organic Allison Farm Planted 6/3 Yield (Bu/A)	Significance Groupings	Rank	Conventional WTU Farm Planted 5/25 Yield (Bu/A)	Significance Groupings	Rank
34A7	3.4	Blue River Hybrids	69.5	a	1	56.8	ab	3
GH389N	3.8	Great Harvest Organics	65.9	ab	2	61.5	a	1
35C6	3.5	Blue River Hybrids	65.6	ab	3	48.2	c	11
LVF 3211	3.2	Lakeview Farms	64.5	abc	4	48.4	c	9
37C6	3.7	Blue River Hybrids	63.9	abc	5	49.0	c	8
39C4	3.9	Blue River Hybrids	63.9	abc	6	58.3	ab	2
GH331N	3.3	Great Harvest Organics	58.7	bc	7	54.3	bc	6
LVF 3507	3.5	Lakeview Farms	57.3	bcd	8	53.7	bc	7
GH291	2.9	Great Harvest Organics	55.0	cde	9	56.3	ab	5
GH349	3.4	Great Harvest Organics	54.6	cde	10	56.4	ab	4
GH327	3.2	Great Harvest Organics	47.6	de	11	40.1	d	12
LVF 3924	3.9	Lakeview Farms	44.7	e	12	48.7	c	9
2016 data			LSD =10.3			LSD = 7.0		

2016 NT Soybean variety trial results

	Rep	Treatment ID #	% Moisture	Yield (Bu/A)
BR 34A7	4	1	13.7	66.6
	1	1	13.4	67.6
	2	1	13.5	70.6
	3	1	13.6	73.0
	5	1	13.6	79.0
BR 39C4	5	1	13.6	64.7
	3	2	13.6	68.0
	2	2	13.5	72.4
	4	2	13.6	74.4
	1	2	13.4	74.4

Conventional reps averaged 10 bu/a less

Sidedressing corn with Nature Safe 13-0-0



TRT	Yield	Bu+	% gain
1	153.9	15.5	11.2%
2	167.9	29.5	21.3%
3	138.4	N/A	N/A

Trt 1 = 35 lbs N banded pre-plant

Trt 2 = Trt 1 + 35 lbs N sidedressed

2016 Pumpkin Seed Treatment Study in Field 4-4

Treatment ID	Rep	Yield (tons/ac)	Average (tons/ac)	Avg. pumpkin weight
1	1	23.53	Azospirillum product	8.8
1	2	20.13		
1	3	18.91		
1	4	25.06		
1	5	24.20		
2	1	28.58	Humate product	9.6
2	2	26.83		
2	3	26.30		
2	4	26.96		
2	5	30.21		
3	1	31.34	Control	9.7
3	2	32.88		
3	3	23.54		
3	4	28.98		
3	5	28.58		



**Last week of
May 2016**

Last week of July 2016






October 2016

~ 1 month later



A wide-angle photograph of a lush green pea field under a bright sky. The field is densely packed with pea plants, and a distinct line of brown, harvested crops is visible in the distance. A yellow rectangular box is centered over the field, containing text.

Treasure
yellow peas
in early June

Harvesting swathed peas with a pickup head







Bred for
Cover Crop and Wildlife



LYNX WINTER FIELD PEA

LYNX WINTER FIELD PEA

LYNX

WINTER FIELD PEA

- IMPROVED COLD TOLERANCE
- WHITE FLOWERING FOR IMPROVED PALATABILITY
- SUSARIBUM WILT/MOSAIC VIRUS RESISTANCE
- EXCELLENT NITROGEN FIXATION

Grown in the U.S.A.

oyp Applied for
Unauthorized propagation prohibited

Net Weight 50 lbs.
(22.7 kgs.)

Lynxpea.com

Late October 2016



5/29

NT soybeans planted
on 5/30



6/10

**All CT soybeans on the farm
planted on 6/3**

**NT soybeans planted
on 5/30**



6/18

**Tine weeding
low-residue
soybeans**





6/28



7/1



7/1



7/1

**Low-residue soybeans growing much faster
than NT and high-residue soybeans**



7/5

NT soybeans are finally starting to grow fast



7/17



7/30



9/18



9/24



10/16



11/9



Preplant weed control for NT beans in 2017



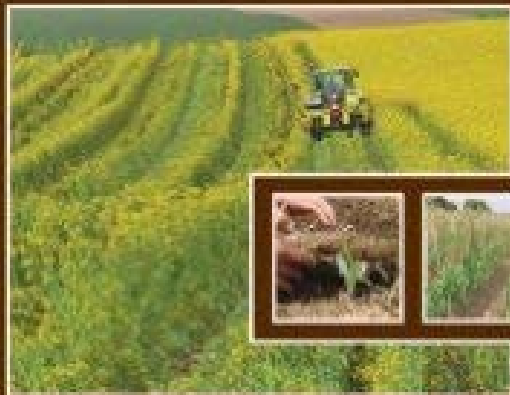
ORGANIC NO-TILL FARMING



ADVANCING NO-TILL
AGRICULTURE

► CROPS, SOIL, EQUIPMENT

JEFF MOYER



“Too much about the roller crimper and not enough about no-till organic farming. A crimper is not the all-to answer for organic no-till farming...not by any means. In the right environmental condition, it is a useful tool to terminate some cover crops, but the book makes it seem as though it solves the termination issue mechanically. There are many situations in which the roller crimper would not be adequate.”

> 5000 views of a recent discussion in the Crop Talk forum of Ag Talk

- [Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - jbgruver : 12/5/2016 21:05
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - frytownfarmer : 12/5/2016 22:00
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - ILCORNGROWER : 12/5/2016 22:02
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - Blusteryknollfarm : 12/5/2016 22:09
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - jbgruver : 12/5/2016 23:10
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - Blusteryknollfarm : 12/5/2016 23:29
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - nviney : 12/6/2016 09:02
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - jbgruver : 12/6/2016 09:36
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - nviney : 12/6/2016 10:07
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - Orfarmer : 12/6/2016 17:36
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - jbgruver : 12/6/2016 18:03
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - Orfarmer : 12/6/2016 23:23
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - Pvfarm : 12/6/2016 08:04
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - Blusteryknollfarm : 12/6/2016 08:15
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - jbgruver : 12/6/2016 08:55
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - Pvfarm : 12/6/2016 09:03
 - **[PDF of presentation about NT organic production on Doudlah farm](#)** - jbgruver : 12/6/2016 09:55
 - [Wasn't Doudlah the first to use drilling soy into standing rye in opposite directions, 10yrs ago?](#) - jakescia : 12/6/2016 10:40
 - [RE: Wasn't Doudlah the first to use drilling soy into standing rye in opposite directions, 10yrs ag](#) - jbgruver : 12/6/2016 10:51
 - [That will occur this oncoming spring.](#) - jakescia : 12/6/2016 12:37
 - [Sorry about the delay in responding](#) - jbgruver : 12/7/2016 20:56
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - CPT JMS : 12/6/2016 22:16
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - Blusteryknollfarm : 12/6/2016 22:23
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - CPT JMS : 12/6/2016 23:09
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - Blusteryknollfarm : 12/7/2016 00:18
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - mhagny : 12/8/2016 06:33
 - [RE: Agronomy Society sponsored webinar on organic no-till corn and soybeans](#) - jbgruver : 12/8/2016 06:57

Planting is easy with Autosteer!



*In 2012, I witnessed a new level of **attention to detail***




We learned how to do it!







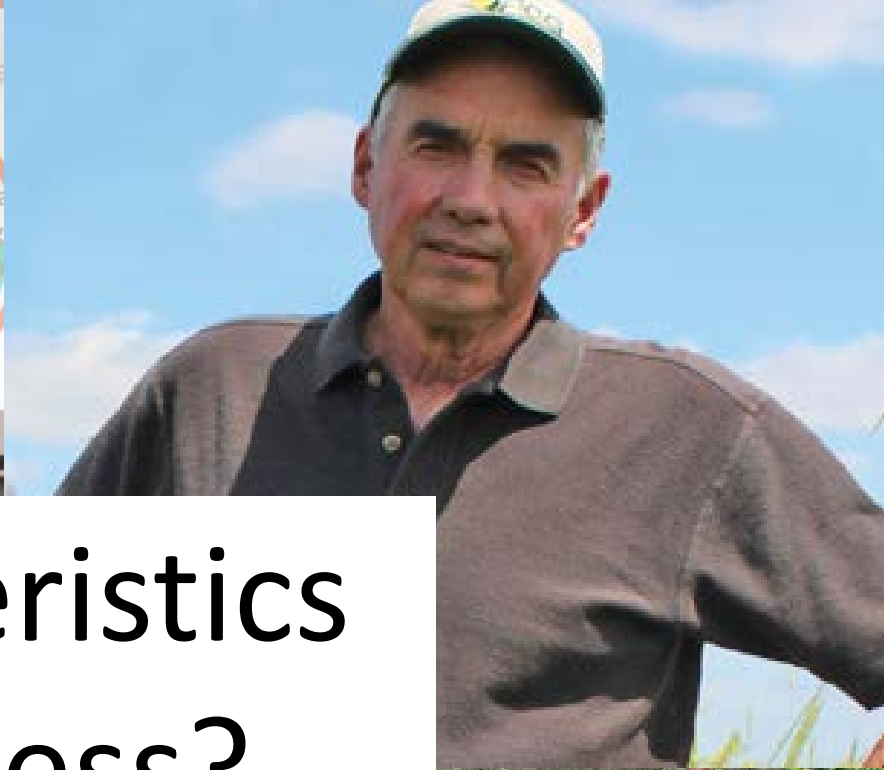
A photograph of a cornfield with young green plants in rows. The soil is dark brown and appears to have some erosion or unevenness between the rows. A yellow text box is overlaid in the center of the image.

Looks great but soil
flow into the row was
inadequate 😞

Weak Links in Organic Farming Systems

1. Poor marketing = reduced capture of premium prices
2. Assuming that you will be successful with organic farming, just because you are successful with conventional farming*
3. Assuming that your planter, drill, cultivators...etc...are adequate = lack of proactive maintenance, adjustment and improvement.
4. Lack of timeliness in field operations especially weed control
5. Planting issues such as planting too early or too shallow. Farmers tend to plant shallow in certain soils because of crusting, but in organic farming a rotary hoe is commonly used for weed control, which also helps eliminate crusting. I have seen uneven corn and soybean emergence in dry weather, which likely could have been avoided if planted slightly deeper.
6. Not providing crops with enough nutrients, especially N.

7. Failure to manage residue effectively resulting in N tie-up, disease/pest issues, plugging of equipment etc.
8. Failure to select well adapted crop genetics with good potential for expected yields/quality.
9. Resistance to using newer technologies such as GPS guidance or newer equipment such as a planter that can precisely deliver seed at correct depth and spacing.
10. Improper selection and/or management of cover crops, especially during years of extreme weather.
11. Not having a good support system of other organic farmers for encouragement and tips.



Characteristics of success?



**It takes a high level of
skill and will to be a
successful organic
farmer!**

