



RODALE INSTITUTE

Take Charge of the Future: It's All About The Soil

Jeff Moyer
Executive Director



RODALE INSTITUTE

Food Fight!





Animal House Food Fight, One Version





Confinement Farrowing Operation





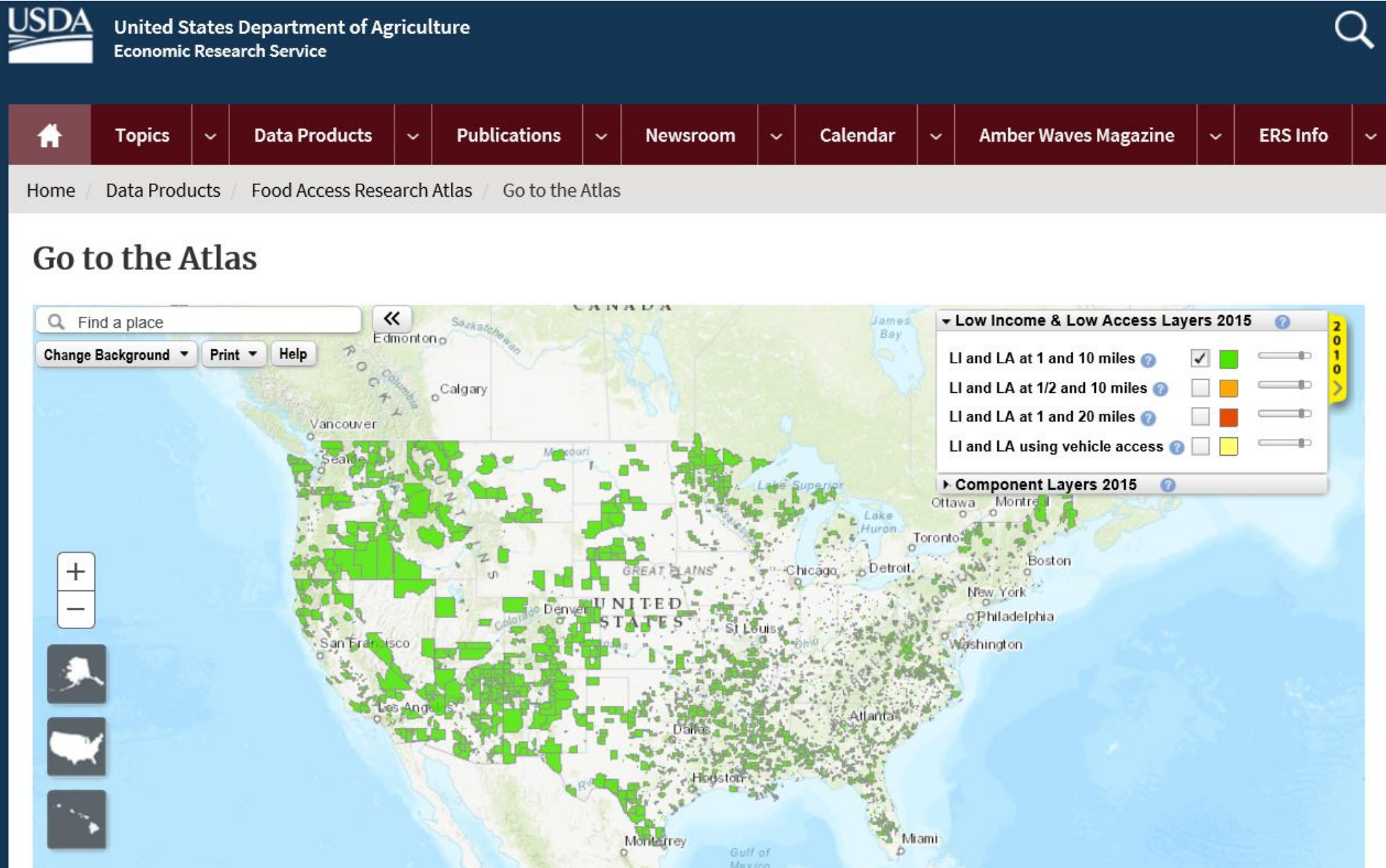
Pastured hog production

Using Hogs to improve soil health





The Bread Basket of America has Food Deserts





US Obesity Rates Climb

“At least 30 LB Overweight”

Adult Obesity in the United States



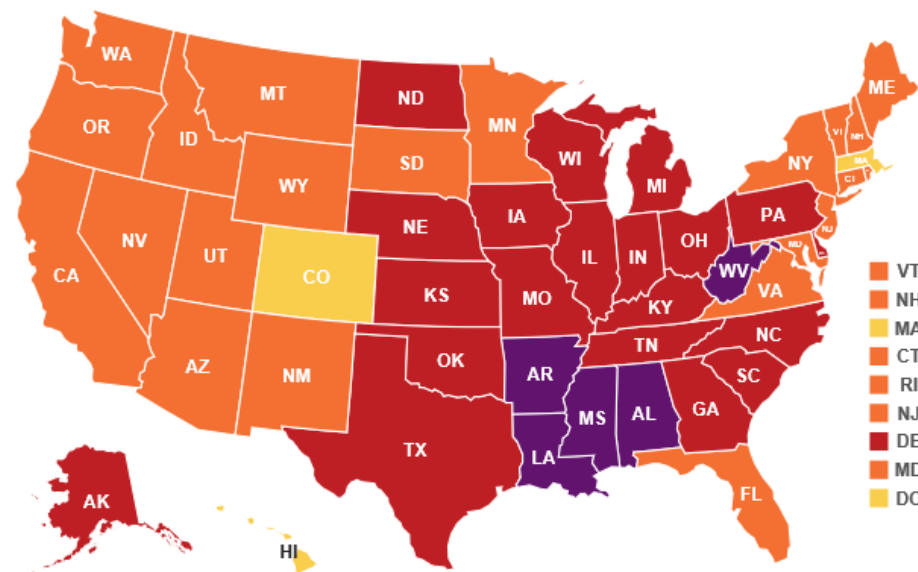
Updated August 31, 2017: According to the most recent data, adult obesity rates now exceed 35 percent in five states, 30 percent in 25 states, and 25 percent in 46 states. West Virginia has the highest adult obesity rate at 37.7 percent and Colorado has the lowest at 22.3 percent. The adult obesity rate decreased in Kansas between 2015 and 2016, increased in Colorado, Minnesota, Washington, and West Virginia, and remained stable in the rest of states. This supports trends that have shown overall leveling off of obesity rates in recent years.

Adult Obesity Rate by State, 2016

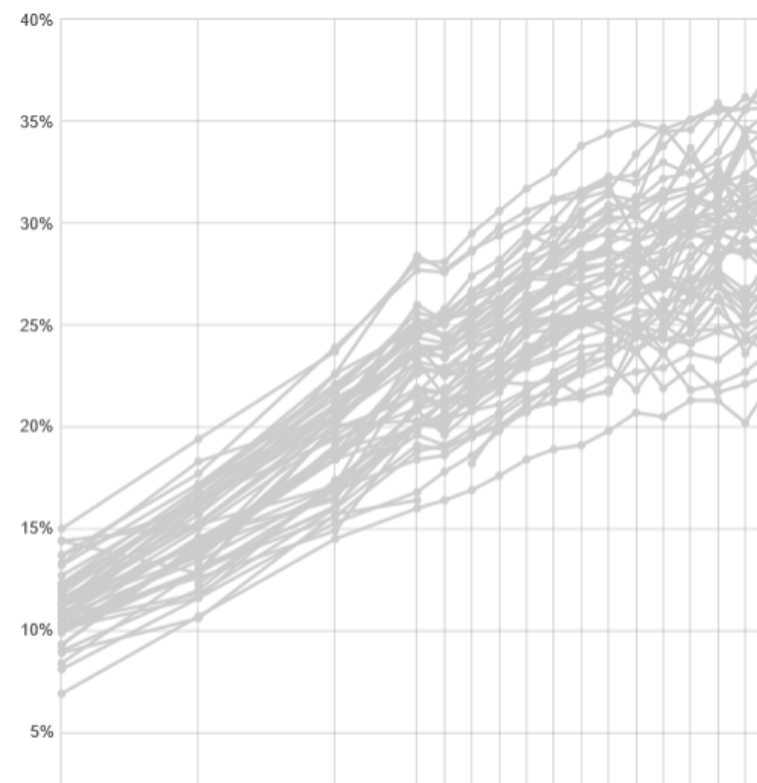
Select years with the slider to see historical data. Hover over states for more information. Click a state to lock the selection. Click again to unlock.

Percent of obese adults (Body Mass Index of 30+)

0 - 9.9% 10 - 14.9% 15 - 19.9% 20 - 24.9% 25 - 29.9% 30 - 34.9% 35%+

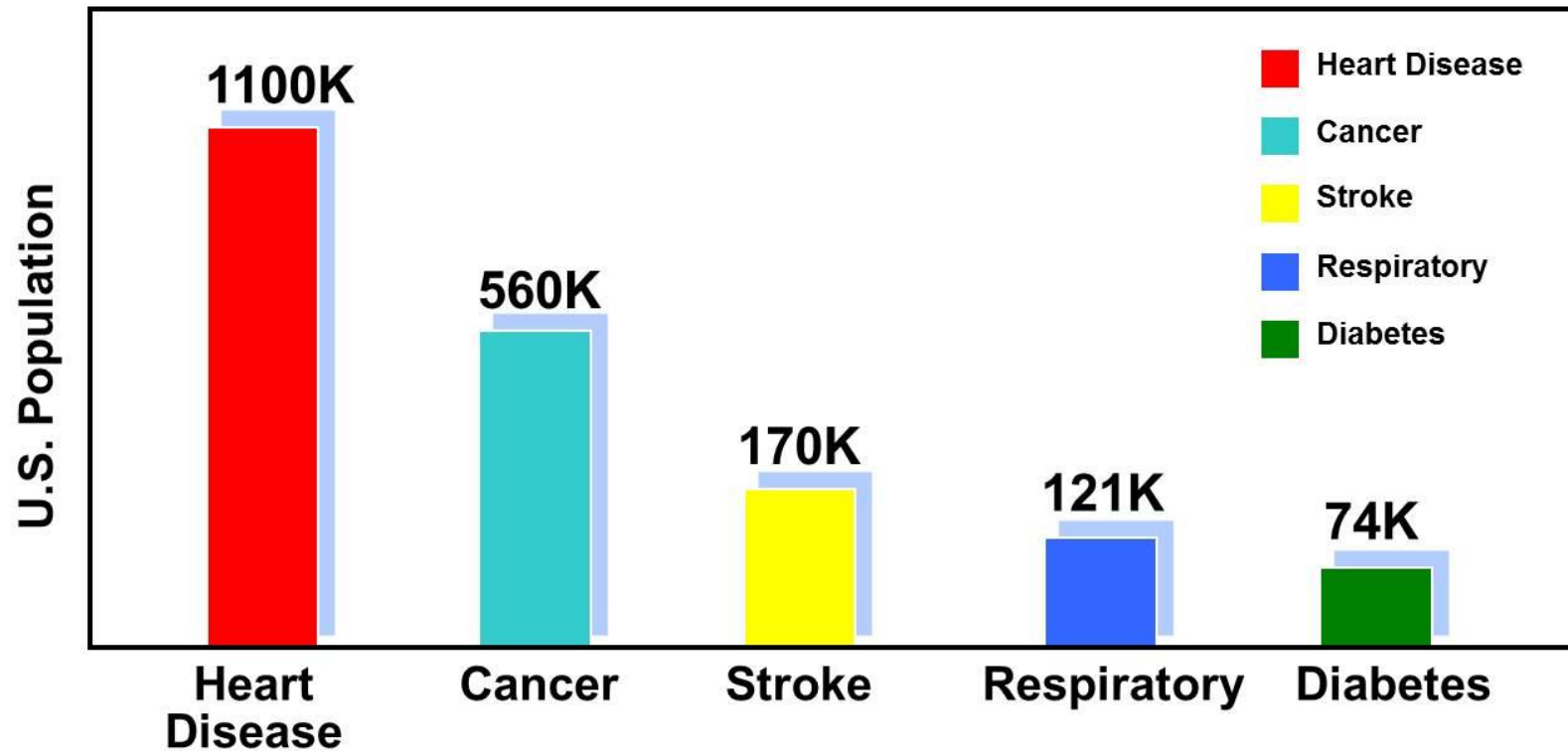


Adult obesity rates, 1990 to 2016



Obesity; The Common Connection To Disease

The Top Killer Diseases in U.S.



Is there a connection? a common denominator among top killers?

- Similar root causes?
- Nutrient deficiencies, inflammation, oxidation, cell starvation
- Slow, wasting diseases
- Increase in Deaths when processed foods increased
- Pre-cursors: obesity, high blood pressure, high cholesterol, fatigue





Gene Editing Replaces GMO



FROM CORN TO CATTLE,
GENE EDITING IS ABOUT TO
SUPERCHARGE
AGRICULTURE

By Dyllan Furness — April 17, 2017 3:00 AM



TALK IN MARKETING

[OptionEye Macro Outlook April 28th](#)

Good morning, Unless you are a cattle guy August has been rough. Across the board things (data points) still look ...[\[More\]](#)

Author: [ShelladyOptions](#) Posted: 04-28-2017

[Floor Talk April 28](#)

[Home](#) » [Technology](#)

HOW GENE EDITING WILL CHANGE AGRICULTURE

By [Betsy Freese](#)

11/22/2016



CRISPR is not the only game in town for gene editing. Cibus, for example, is one of many molecular plant biology start-ups trying to release products and secure patents for genome-editing technologies. Cibus already has a crop on the market, a herbicide-tolerant canola.

“Our goal is to have traits in every major crop within the next decade.

We already have herbicide-tolerant SU Canola. We will see a release in

the 2019-2021 time frame of glyphosate-resistant flax, herbicide

-resistant rice, and numerous others.”



Gene Editing in Livestock

PHYS ORG

Nanotechnology

Physics

Earth

Astronomy & Space

Technology

Chemistry

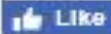


Home > Biology > Biotechnology > February 21, 2017

Gene editing mulled for improving livestock

February 21, 2017 by Jean-Louis Santini

197



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Artificial insemination, embryo transfer and genetic selection have led to significant improvements in animal breeding in recent years

Gene editing, which has raised ethical concerns due to its capacity to alter human DNA, is being considered in the United States as a tool for improving livestock, experts say.



Gene Editing on Humans

THE WALL STREET JOURNAL.

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WORLD

China Pushes Ahead With Human Gene-Editing Trials

The U.S. is yet to begin its first human trial involving the Crispr-Cas9 gene-editing technique

By [Preetika Rana](#)

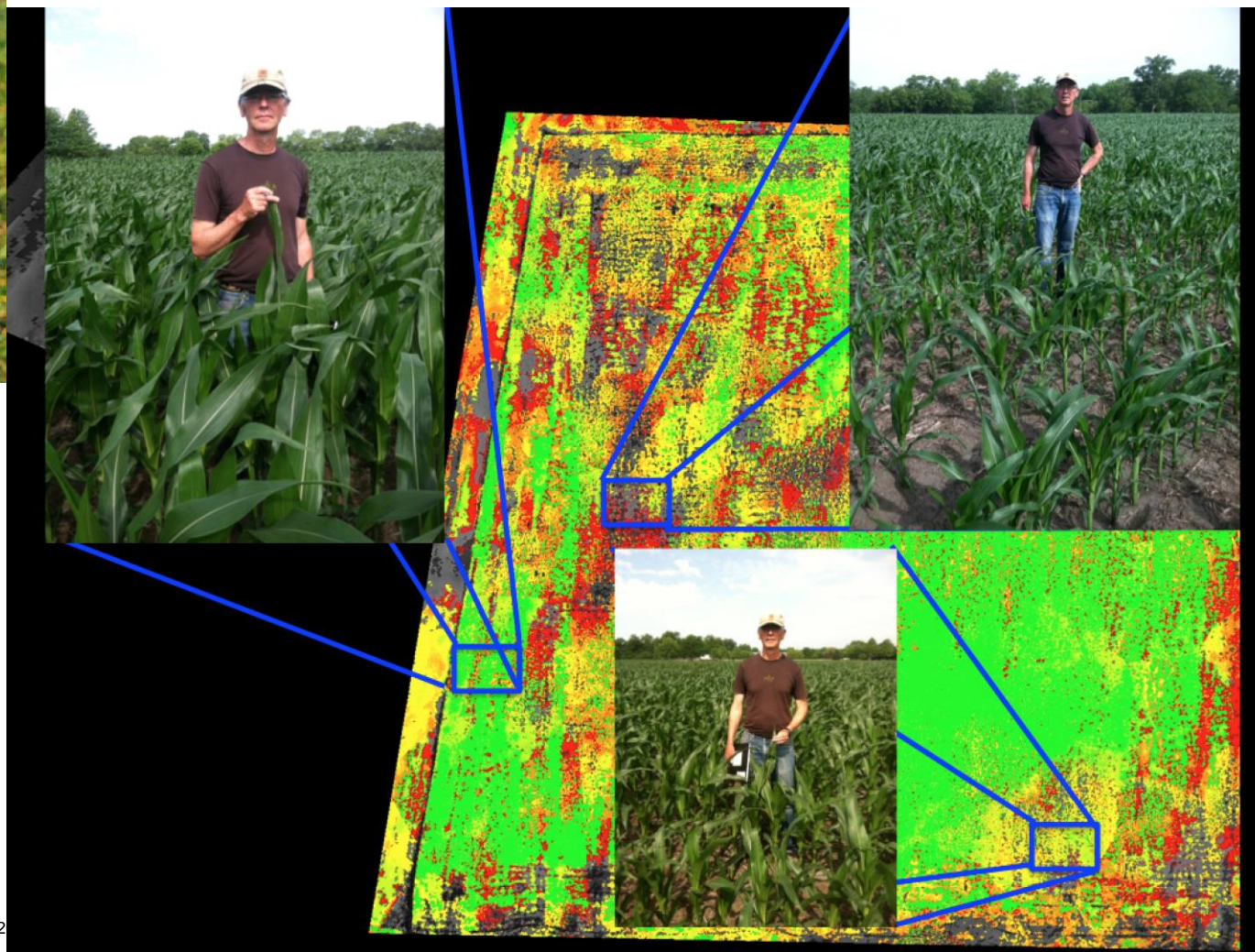
April 28, 2017 7:47 a.m. ET

A Chinese university modified human genes and injected them into a cancer patient on Friday, marking only the second time a revolutionary technique has been tested on humans.





Drone Technology Replaces Boots On The Ground





Robotic Farmers





Equipment Keeps Getting BIGGER!





But, Maybe, Smaller IS Better





Not, how big can I getBut How efficient and small can I get and make a living



 Scale is all relative, big isn't bad as long as the
goal isn't lost





Our Broken Food System

When Only Yields Are Considered





Soil Loss



Half of the topsoil on the planet has
been lost in the last 150 years.

Nationwide, the U.S. lost 1.7 billion tons to erosion in 2007
Spread this soil out to a depth of one inch, the amount of
soil lost during this period would cover the states of
Massachusetts and Vermont and fill more than 15.6
million railroad cars. States experiencing the largest total
soil losses in 2010 were (in tons):

1. Texas	225,044,854
2. Iowa	146,768,998
3. Minnesota	140,241,850
4. North Dakota	132,950,209
5. Kansas	101,618,510



Soil degradation: A global concern

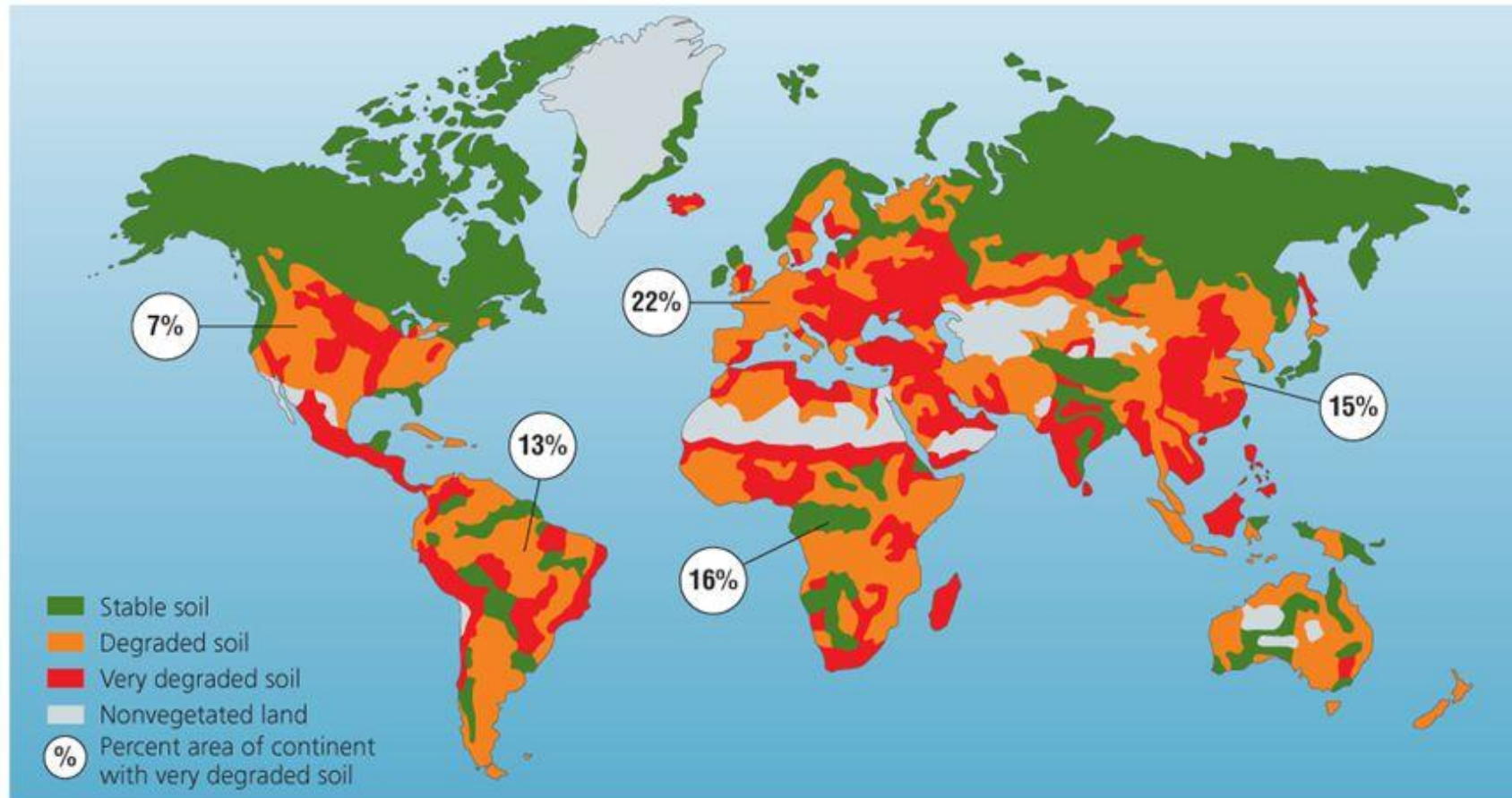


FIGURE 7.9 Soils are becoming degraded in many areas worldwide. Europe currently has a higher proportion of degraded land than other continents because of its long history of intensive agriculture, but degradation is rising quickly in developing countries in Africa and Asia. Source: Data from United Nations Environment Programme (UNEP), 2002. Global Environmental Outlook 3. London: UNEP and Earthscan Publ.

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Stephen Hawking now says humanity has only about 100 years to escape Earth

Professor Stephen Hawking Warns Humans **MUST** Leave Earth in 100 years

By Erin Elizabeth - May 9, 2017

9



According to renowned astrophysicist Professor Stephen Hawking, mankind must leave planet Earth in the next 100 years in order to survive.



It's Not Only About Yields

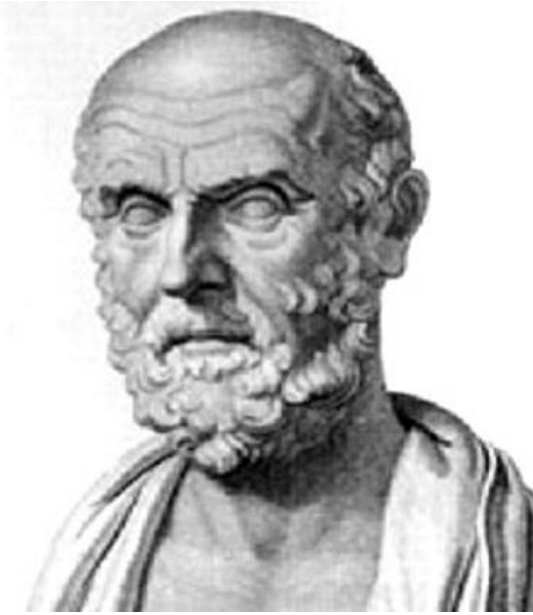


It's About the SOIL!

**“To be a successful farmer one must first know the nature of the soil.” –
*Xenophon, Oeconomicus, 400 B.C.***



Hippocrates



460 to 370 BC

“A physician should know something about the soil
where a patient’s food comes from”

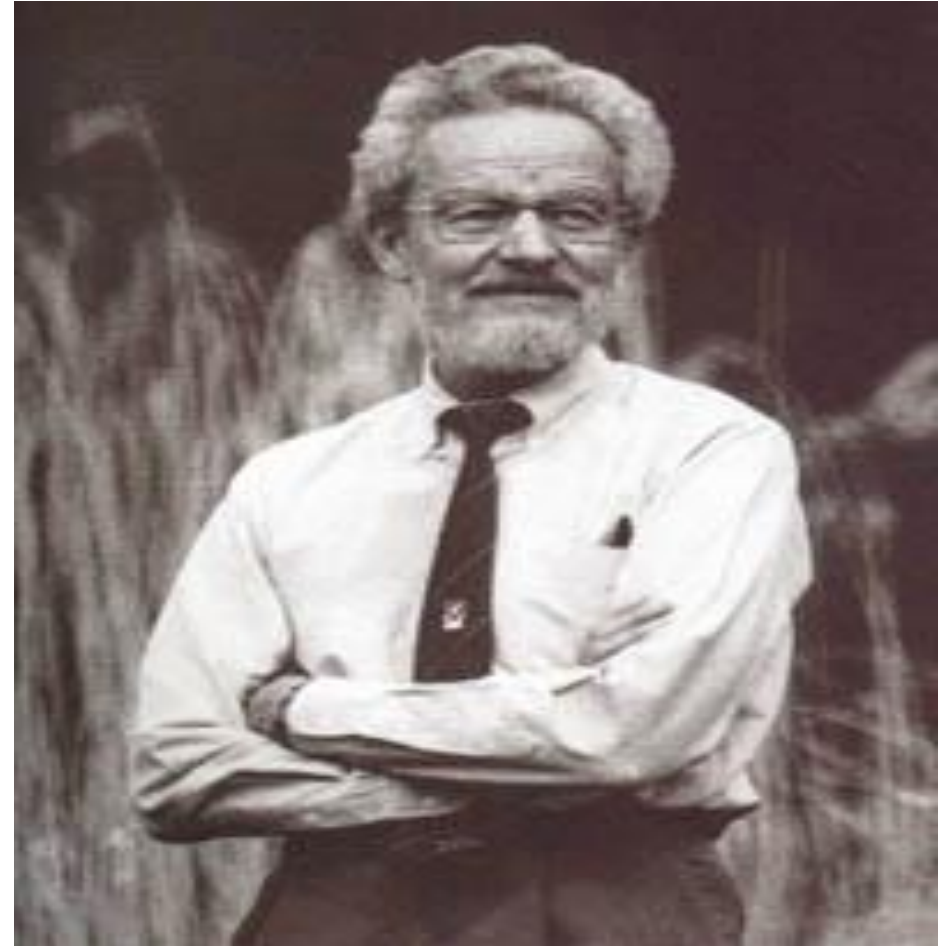


Healthy Soil = Healthy Food = Healthy People

A Legacy of words and mission



Organic



Robert Rodale
Regenerative



St. Luke's Rodale Organic Farm





Organic Farm



- Doubled from five to ten acres
- Food service (Sodexo) puts organic food on patients plates
- More than 45,000 pounds of produce in year 2
- Select new moms at St. Luke's University Hospital-Bethlehem will receive a fresh basket of produce
- Organic food in faculty and guest cafeteria
- Let's create a Farmacy (pharmacy)





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THE SCIENCES MIND HEALTH TECH SUSTAINABILITY EDUCATION VIDEO PODCASTS BLOGS STORE



THE CONVERSATION

CONSERVATION

3 Big Myths about Modern Agriculture

Myths get in the way of our ability to restore degraded soils that can feed the world using fewer chemicals

By David R. Montgomery, The Conversation on April 5, 2017



**MYTH 1: LARGE-SCALE AGRICULTURE FEEDS
THE WORLD TODAY**

MYTH 2: LARGE FARMS ARE MORE EFFICIENT

**MYTH 3: CONVENTIONAL FARMING IS
NECESSARY TO FEED THE WORLD**



Regenerative Organic Agriculture

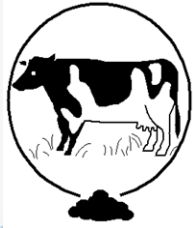
Same Resources..... Different Philosophy





Changes Based On Science

Farming Systems Trial (FST)



➤ Organic-manure based

- Cash crops: Oat - Soybean - Wheat – Corn – Silage - Hay
- Cover crops: Rye or Hairy Vech
- Amendments: Compost



➤ Organic-legume based

- Cash crops: Corn – Oats - Barley - Soybean - Wheat
- Cover crops: Rye – Clover – Hairy Vetch
- Amendments: none



➤ Conventional-chemically based

- Cash crops: Corn – Corn – Soybean – Wheat
- Cover crops : Rye or Hairy Vetch
- Amendments: Synthetic



FST Soil Results



Soils of the organic systems have a more active soil biological community

- higher levels of glomalin (a glycoprotein that acts like 'glue', binding organic matter to mineral particles),
- greater populations of mycorrhizae (a fungus that forms a symbiotic relationship with its host plant: the fungus receives carbohydrates from the plant, which in return gains access to water and nutrients).

This leads to improved soil structure and enhanced carbon sequestration.



Agroecosystem Resilience (2016)

Organic Corn

Conventional Corn



**Phosphate and
Nitrate Stress**



A Different Way of Farming (Organic No-Till)





Old Boss





New Boss

MISCONCEPTIONS

MILLENNIALS

THE REALITY

THEY'RE ALL
BROKE¹



THEY DON'T CARE²



FRIVOLOUS SPENDERS⁴

WE SHOULD DEVELOP CUSTOMER SERVICE
STRATEGIES FOR THE BOOMERS FIRST⁶



THEY FALL FOR
THE FLASHY⁷



THEY'VE GOT
ENTITLEMENT COMPLEXES⁸

THEY LACK LOYALTY⁹

THEY HAVE
OVERINFLATED,
UNREALISTIC
EXPECTATIONS¹⁰

A DANGEROUS MISCONCEPTION TO HAVE:
**CUSTOMER SERVICE IS LESS
IMPORTANT TO MILLENNIALS**

SPOILED
AND LAZY³

ME
ME
ME

THEY DON'T VALUE
AUTHENTICITY⁵

80
MILLION
MILLENNIALS
(IN U.S. ALONE)¹¹

SPEND ROUGHLY
\$600B
ANNUALLY¹²

68%
DEMAND AN INTEGRATED,
SEAMLESS EXPERIENCE
REGARDLESS OF CHANNEL

MILLENNIALS HAVE INFLUENCE
ON FRIENDS' AND FAMILIES'
PURCHASING DECISIONS¹⁴



FROM SMARTPHONE



TO COMPUTER



TO PHYSICAL STORE¹³

WHAT DOES THIS MEAN FOR YOUR CUSTOMER SERVICE?

CUSTOMER SERVICE NEEDS TO BE
ACCESSIBLE & FAST¹⁵



IF THERE ARE BARRIERS OR
DELAYS THEY WILL HAPPILY GO ELSEWHERE¹⁶

CONVENIENCE
IS KEY¹⁸



IT'S A CONVERSATION¹⁷
(ONE THAT IS INCREASINGLY DIGITAL)

DIGITAL SELF-SERVICE IS MORE
IMPORTANT THAN EVER BEFORE

**THE NEED FOR DIGITAL
CUSTOMER SERVICE**

WE SURVEYED 20 MILLENNIALS:



PREFER A WEBSITE
THAT ANSWERS
QUESTIONS QUICKLY
OVER A CALL CENTER¹⁹



79%
TELL FRIENDS ABOUT BAD
CUSTOMER SERVICE EXPERIENCES²⁰



51.5%
EXPERIENCE WILL SWITCH TO
A NEW COMPANY AFTER A
BAD CUSTOMER EXPERIENCE²¹



Buying Decisions Based on Values Not Value





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[Retail Market Trends](#)

[Organic & Natural](#)

Generation Z and the Future of Organic Foods

Revealing itself as discerning grocery shoppers, Generation Z issues fresh demands on food product developers

March 27, 2018

Generation Z, those born 1997 to present, has the potential to take demand for “real” unadulterated food to new heights, finds a new report from The NPD Group, a global information company. Raised by Gen X parents, **Gen Zs have higher consumption rates of organic foods and beverages than any other group, and they were taught at a young age the value of food in terms of function and nutrition and not just how it tastes.**



Consumers Have Choices

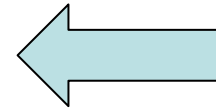


*Meets Humane Farm Animal Care Standards, Which include nutritious diet without antibiotics or hormones, animals raised with shelter, resting areas, sufficient space and the ability to engage in natural behaviors.



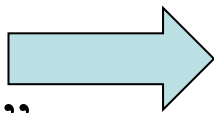


New Farmer Training



Interns:
“Getting Young people Involved”

Veteran Training
“Send in the Marines”



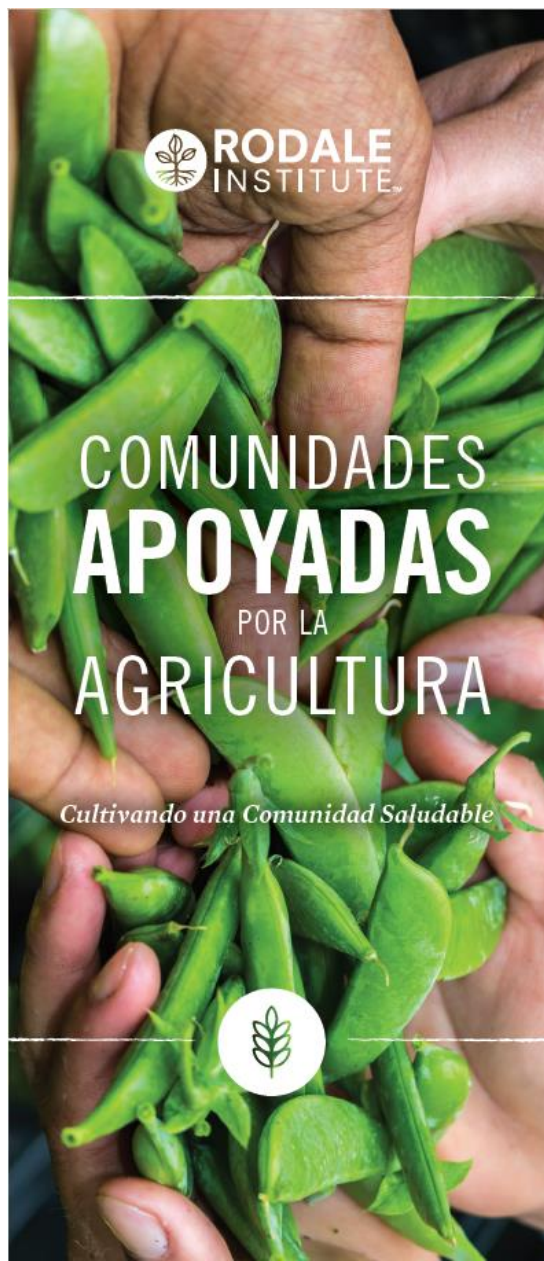


Growing a New Crop of Farmers





Marketing Language is the Key



¿QUE SON LAS COMUNIDADES APOYADAS POR LA AGRICULTURA?

El Programa de Comunidades con Apoyo Agrícola (ASC) del Instituto Rodale permite a los residentes de la comunidad tener acceso a productos orgánicos frescos y de alta calidad cultivados localmente en el Instituto Rodale en Kutztown, Pensilvania. Esta es una participación de la granja, a menudo conocida como CSA, o agricultura apoyada por la comunidad.

Cada semana de la temporada, los miembros de ASC reciben una parte mixta de la cosecha, ¡lo que sea fresco, denso en nutrientes y en temporada! Los miembros pueden pagar por adelantado durante la temporada completa, ayudando a los agricultores con los costos operativos de inicio de temporada, como semillas y equipos. También ofrecemos una opción semanal de pago por uso (debe comprometerse con una temporada completa) para miembros de la comunidad con un presupuesto ajustado. El pago de estas acciones se puede hacer con dinero en efectivo, tarjeta de crédito o tarjeta EBT para SNAP (Programa de Asistencia de Nutrición Suplementaria) Beneficios en los sitios de recolección. El débito automático semanal es otra opción de pago conveniente que los miembros eligen.



CÓMO FUNCIONA

Los miembros pueden recoger acciones semanalmente en uno de los cinco sitios de la comunidad local en Kutztown, Allentown, Reading o Emmaus. La temporada de ASC del Rodale Institute se extiende desde aproximadamente principios de Junio hasta mediados de Noviembre (las fechas exactas pueden variar debido a los patrones climáticos). Una porción consiste de 1-2 bolsas de productos orgánicos frescos de temporada y puede incluir verduras y hierbas. Otros productos como carnes orgánicas, flores, huevos, manzanas y sidra están disponibles para ordenar por temporadas por una tarifa adicional.

¡Únete hoy! Al unirse al programa ASC del Instituto Rodale como accionista, usted está apoyando la agricultura orgánica, los sistemas alimentarios locales y la salud comunitaria.

PRECIOS

• **ACCIONES REGULAR DE VEGETALES**
(sirve a familias de 3 a 5):
\$ 750 por la temporada o \$ 30 por semana

• **ACCIONES PEQUEÑAS DE VEGETALES**
(sirve a la familia de 1 o 2):
\$ 450 por la temporada o \$ 20 por semana

• ACCIONES DE CARNES

	MENSUAL	TEMPORADA COMPLETA
CERDO PEQUEÑO	\$85	\$425
CERDO GRANDE	\$125	\$625
POLLO PEQUEÑO	\$20	\$100
POLLO GRANDE	\$40	\$200
DUO PEQUEÑO	\$95	\$475
DUO GRANDE	\$115	\$575

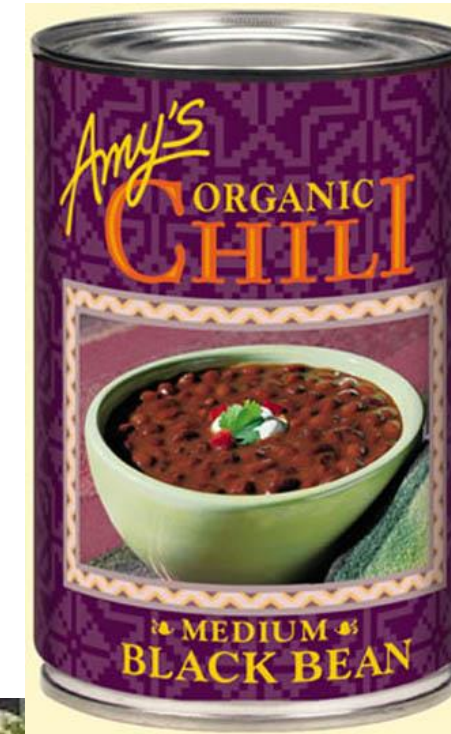


EJEMPLOS DE PRODUCTO ESTACIONAL INCLUYEN:

PRIMAVERA	VERANO	OTOÑO
RÚCULA	ALBAHACA	RÚCULA
REMOLACHAS	FRIJOL, BUSH	REMOLACHAS
BRÓCOLI	REPOLLO	BRÓCOLI
BRÓCOLI RAAB	CANTALUPO	BRÓCOLI RAAB
REPOLLO, NAPA	MAÍZ	REPOLLO
ZANAHORIAS	PEPINO	REPOLLO, NAPA
CILANTRO	BERENJENA	ZANAHORIAS
ENELDO	ESCAPOS DE AJO	ENDIBIA
COL RIZADO	MELÓN	AJO
COLINABO	ORÉGANO	COL RIZADO
LECHUGA	PEREJIL	COLINABO
MEZCLA DE MESCLUN	AJÍ PICANTE	LEEK
MOSTAZA	AJÍ DULCE	LECHUGA
GUISANTES SNAP	PAPAS	CEBOLLA
GUISANTES	ROMERO	ORÉGANO
RÁBANO	CALABAZA DE VERANO	PAC CHOI
CEBOLLINO	ACELGA	PEREJIL
ESPINACAS	TOMATES CHERRY	PAPAS
NABOS	REBANADO DE TOMATES	RÁBANO
	TOMILLO	SABIA
	CALABACÍN	ESPINACAS
		NABOS
		CALABAZA DE INVIERNO



Together – Farmer and Consumer, We Can Make the Changes of the Future Positive





Rodale Institute

We can all make a difference

Support organic farming and
take charge of the future!

Thank You!

Jeff.moyer@rodaleinstitute.org

