

Comparing Sustainable Farming to Conventional, Organic & Biodynamic Farming

2017 California Plant and Soil Conference
January 31, 2017

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Presentation Outline

- Challenges of Sustainable Farming
- Brief History of Organic, Biodynamic & Sustainable Farming
- Defining Sustainable Farming
- Concluding Remarks about Sustainable Farming

Why is Discussing Sustainable, Organic and Biodynamic Farming so Challenging (and interesting!) ?

Because it is often infused with a mixture of the following (not in order of importance):

- Science
- Dogma
- Passion
- History
- Ideology
- Philosophy
- Economics
- Marketing
- People
- Agendas
- Etc.

Reactions of Many Growers to Sustainable Farming



Three Challenges Presented by Sustainable Agriculture

1) Defining it:

- How can I do it if I can't define it?
- What is the scope of the definition?
- There are no universally accepted standards – not been codified

2) Implementing it:

- What can I do on my farm?
- How do we extend this to an entire sector/region?

3) Measuring it:

- Tracking practices & performance – where am I at?
- How is it impacting my farming operation?

History of Sustainable Farming

Connected to History of Organic Farming:

- Organic farming evolved in the 1920's, 30's & 40's
- Rudolf Steiner's 1924 lectures that led to Biodynamic farming – no synthetic inputs
- Sir Albert Howard and Lady Eve Balfour in 1940's promoted the importance of humus and good soil fertility
 - Return crops by-products soil and use animal manures, too.
 - Concerned about negative affects of synthetic fertilizers and pesticides on soil
 - Concerned about how to feed rapidly expanding world population

Word 'organic' first used in 1940's in reference to sustainable agriculture by Lord Northbourne

“farm is a dynamic, balanced, living organic whole”



Defining Organic Farming

Organic farming is “an ecological production management system that promotes and enhances biodiversity, biological cycles, and soil biological activity. It is based on minimal use of off-farm inputs and on management practices that restore, maintain and enhance ecological harmony.” (National Organic Standards Board, 1998)



Basic Organic Crop Standards – From NOP Website

- Land must have had no prohibited substances applied to it for at least 3 years before crop can be certified organic
- Soil fertility and crop nutrition managed through tillage & cultivation practices, crop rotation, and cover crops and supplemented with animal and crop waste materials
- Crop pests, weeds, and diseases controlled primarily through physical, mechanical and biological controls. When necessary OMRI approved pesticides can be applied
- Use of genetic engineered materials, ionizing radiation, and sewage sludge is prohibited

Role of the Green Revolution in Evolution of Sustainable and Organic Farming

Green Revolution evolved in 50's-60's

- emphasis on genetically enhanced plants
- high energy off-farm inputs such as:
 - mechanization (burning of fossil fuels)
 - synthetic pesticides
 - synthetic fertilizers
- Produced low cost food for the public

Questions arose beginning in the 1970's about long-term 'sustainability' of this approach – what are the true production costs

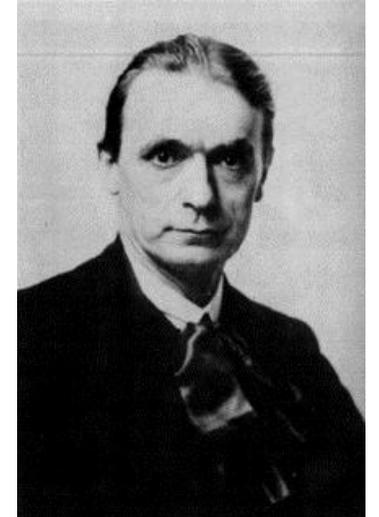
Sustainable farming continued to evolve as alternative to 'industrial' agriculture (conventional agriculture)

History of Biodynamic[®] Farming

To understand Biodynamic farming it helps to understand the man behind it

Rudolf Steiner:

- Born in 1861
- As youth became well versed in natural sciences
- Out of own interest began reading philosophy books
- Saw a constant interplay between material & spiritual world
- Became convinced material and spiritual world can only be bridged through philosophy
- In 1902 declared that his life's work was to develop new methods for spiritual research based on science



Rudolph Steiner - Spiritual Scientist

- Called himself a spiritual scientist
- Termed his science 'Anthroposophy'
- Very controversial figure, some felt he was developing an occult, he even received death threats
- By 1905 was established enough to start receiving invitations to give lectures on the topic
- By 1917 began putting Anthroposophy to practical use

Rudolph Steiner – Extension & Outreach based on Anthroposophy

- In 1917 Waldorf/Astoria Cigarette factory ask Steiner to develop school for employees' children. Developed an educational system based on Anthroposophy – became the Waldorf/Steiner School in 1919, schools are now world wide
- In 1920 was asked to develop a series of lectures for doctors and medical students on anatomy, physiology, pathology, included diagnoses and remedies, including some medicines.
- In 1924 some farmers asked him to develop a series of lectures on farming. He delivered 8 before he died in 1925. Biodynamic farming based on these lectures. Program is certified by Demeter.

A Snapshot of Biodynamic Farming

- Takes holistic approach to farming – the whole universe affects what happens on the farm
- Breaks effects into two groups – earthly and cosmic
- Each farm is an organism and should be as self-sufficient as possible
- Farm must have both crops and livestock
- No synthetic materials can be applied since they are not ‘living’ or derived from the living.
- Biodynamic farming involves the development and use of 9 preparations to improve the health of the cropping system.

The Biodynamic Preparations

There are 9, numbered from 500 – 508

500 – 501 are applied as a spray to the plant or soil

Example preparation – 501:

Ground quartz mixed with rain water to make paste, stuffed into cow horn – ideally from one that has calved several times but < 8 years old, horn buried in late spring (solstice) in sunny spot and dug up in fall. Material in horn is mixed (in a very specific way) with rain water and applied to the crop plants.

The Biodynamic Preparations

There are 9, numbered from 500 – 508

500 – 501 are applied as a spray to the plant or soil

Example preparation – 501:

502 – 508 are made from the following plants : yarrow blossoms, chamomile blossoms, stinging nettle, oak bark, dandelion flowers, valerian flowers, and horsetail.

Each preparation is made in a special way. E.g. 502:

Made from yarrow flowers that are put in the bladder of a red deer stag, suspended in the sun throughout the summer and buried in the ground during the winter. It is then added to a compost pile, along with some of the other preparations, to aid the composting process, resulting in Biodynamic compost.

Defining Sustainable Agriculture



Leaving the farm in as good or better shape for the next generation than when one started farming it.

- 1987 United Nation's Brundtland Commission

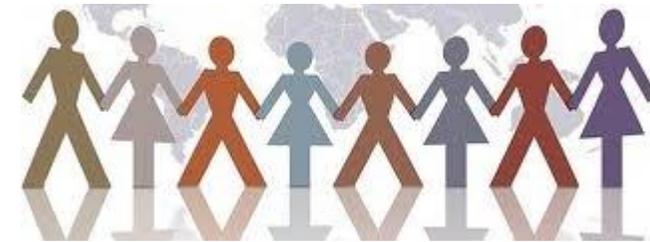
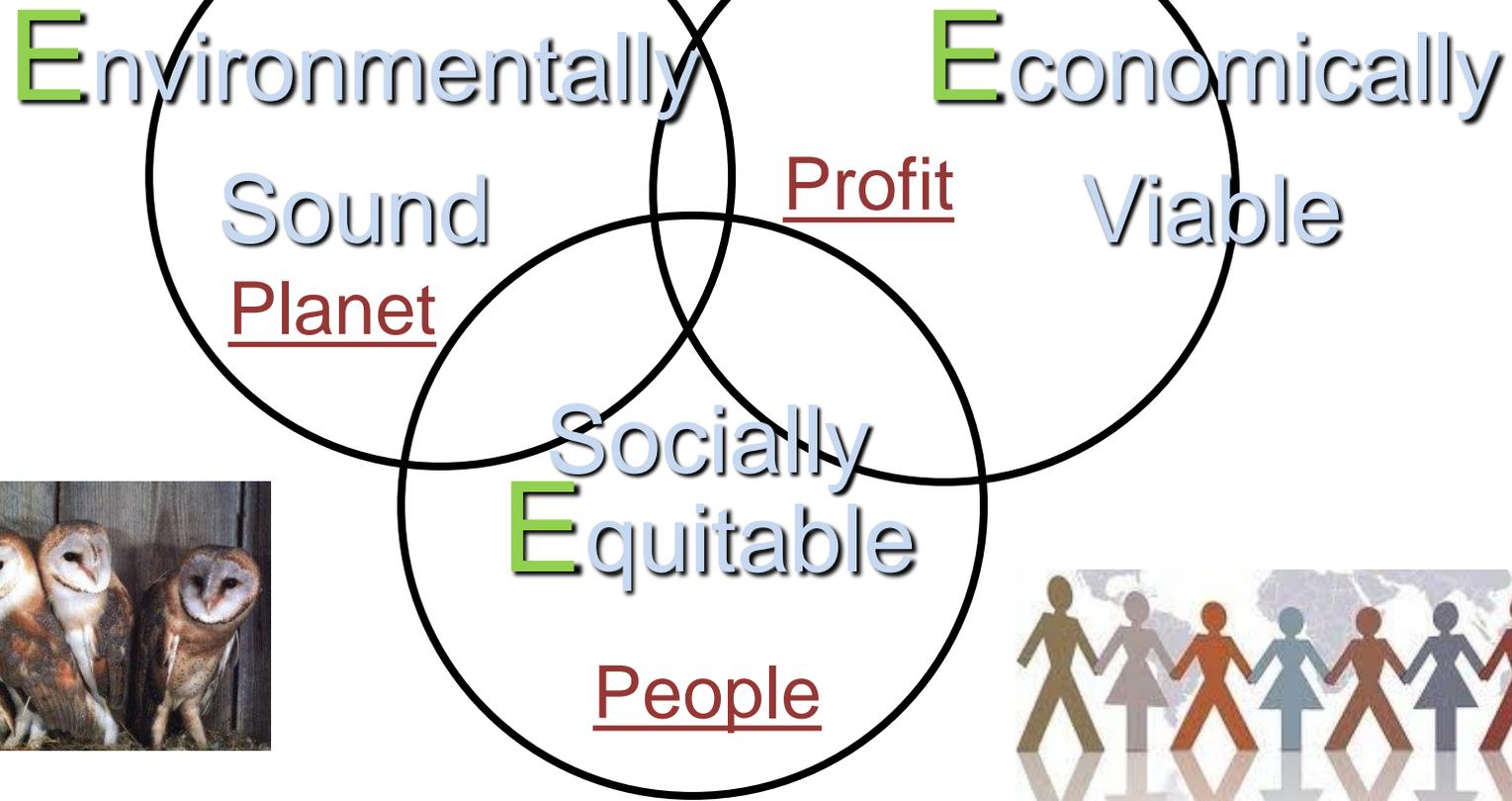
Defining Sustainable Agriculture



...development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

- 1987 United Nation's Brundtland Commission

So what is Sustainable Farming?



The three “E’s” of Sustainability

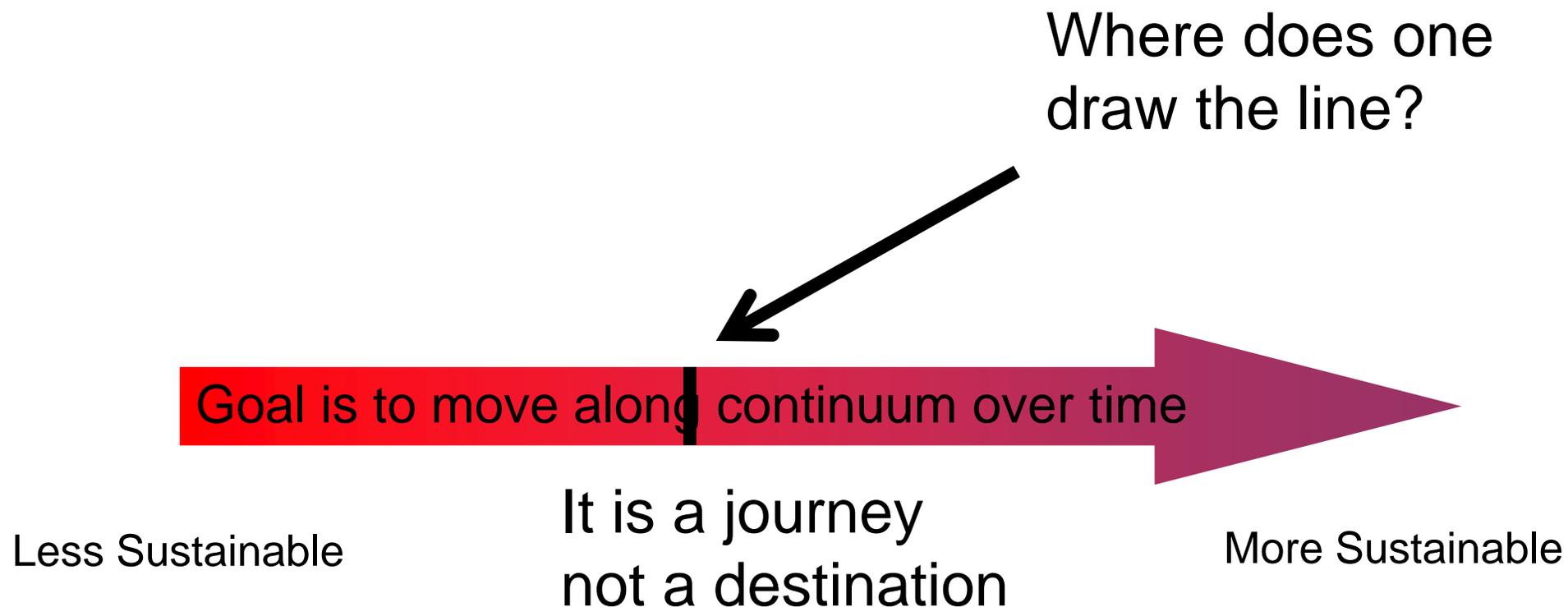
“P’s”

What is Sustainable Farming?

- It focuses on all aspects of farming
 - Soil management
 - Water management
 - Nutrient management
 - The crop, yield & quality
 - Air quality
 - Energy use
 - Packing & shipping
 - Areas not farmed
 - Family, employees and community



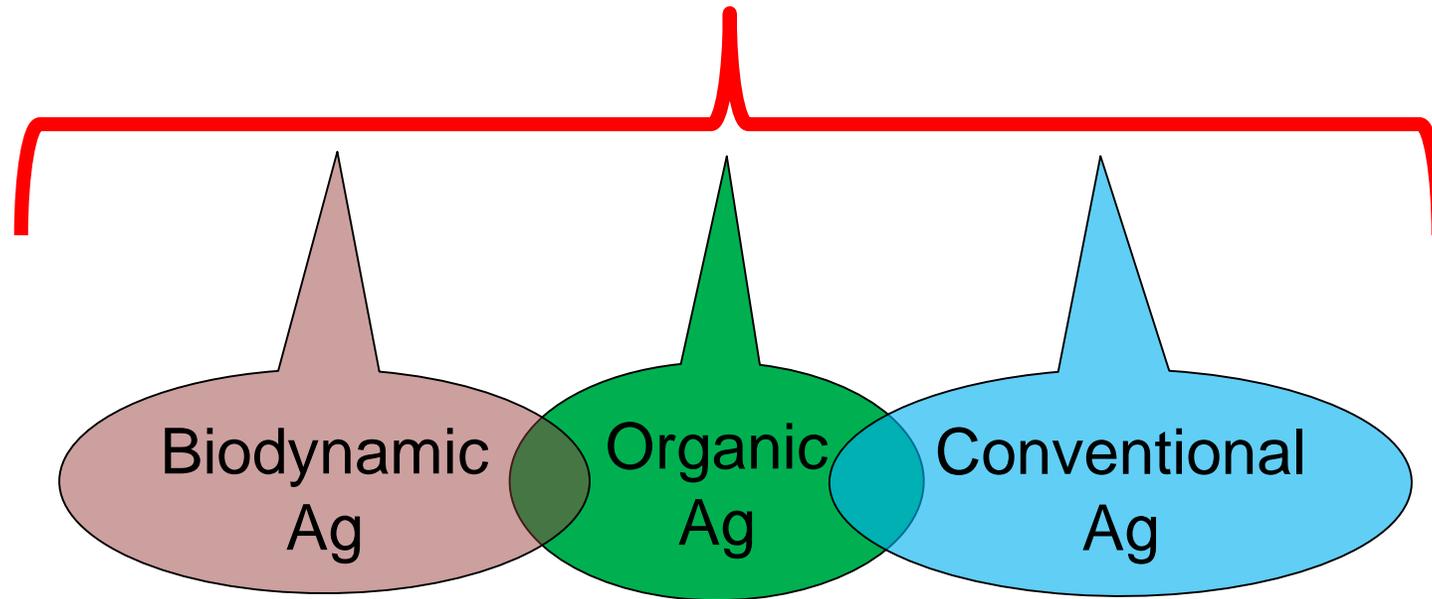
Viewing Sustainable Farming as a Continuum



Thoughts to Consider when Discussing Organic, Biodynamic, Conventional & Sustainable Farming

- Organic and Biodynamic farming evolved and were codified in the 1920's – 40's and focused on important farming issues of the time (e.g., soil health, synthetic fertilizers & pesticides)
- Present day farming concerns are use of water, energy, impacts on biodiversity, pollinators, social equity and GHG production – organic and Biodynamic standards do not address these issues
- Therefore, growers implementing sustainable farming are not necessarily in transition to organic or Biodynamic farming

Sustainable Farming is the umbrella!

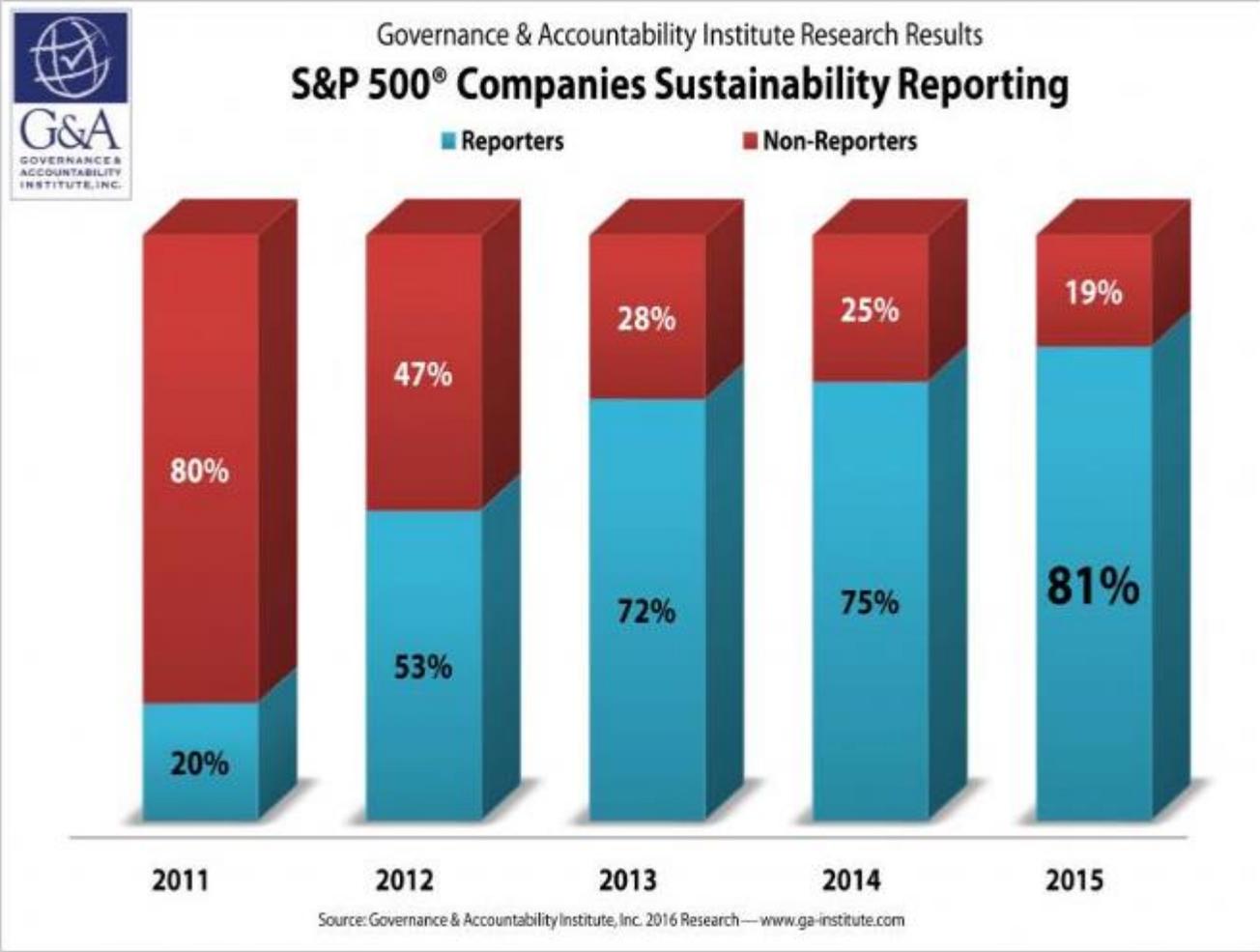


Can't we all get along??

How Do I View Sustainable Agriculture?

- Sustainable farming is paying attention to detail
- Knowledge management – how information is used to drive actions
- Measure to Manage – If you can't measure it you can't manage it
- Perception of what we are doing may be different from what we are actually doing
- Sustainable agriculture exists in a world where the horizon is always receding – new challenges continue to appear (e.g., climate change)

Is Sustainability a Fad? - Not according to this graph!



That is why buyers are leaning on suppliers to provide information on farming practices

Future Trends in Sustainable Agriculture Initiatives

- Things keep changing – e.g., use of the term ‘Regenerative Agriculture’; climate beneficial food production
- Verification & certification growing in importance
- Using metrics to measure performance and outcomes (e.g., GHG production, water footprint, nitrogen foot print, etc.)
 - Most initiatives and certification programs are practice-based, not outcome based
 - Are practices being recommended actually having a positive effect on desired outcomes?

Concluding Remarks

- Sustainable agriculture paradigm is here to stay
- Supply chain demand for use of performance metrics will increase
- Regulatory compliance will continue to increase
- Pro-active trade associations will have the most success in addressing sustainable agriculture issues for their members
- There is a lot happening in sustainability arena; the challenge is figuring what to do about it
- Your goals for the future will determine how you address sustainable farming and what type of program will achieve them

If you don't know where you are going, you may end up some place else – Yogi Berra



Thank You



Questions?