



UF UNIVERSITY of FLORIDA

IFAS EXTENSION

The Green Machine



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Green Machine is Changing!

Greetings and Happy New Year! This issue of the *Green Machine* is the first of a series that will be published on a quarterly basis this year. During 2009 the emphasis for the *Green Machine* will shift from a mix of agricultural and homeowner horticultural topics to focusing on commercial agricultural interests. The *Cutting Edge* Newsletter, which made it's debut last fall, will also come out quarterly and will focus on homeowner horticultural education. Readers who want only one newsletter are encouraged to let us know you're preferences.

Inside this issue:

Green Machine Changes & Farming the Crossroads 1

Non-Organic Farming 2

Organic Farming 3

What Farming Method is Good For Me? 4

Farming the Crossroads

Recently I have had the opportunity to learn more about Organic Farming. I realize that the term itself can create a lot of confusion and hard feelings amongst some farmers because, unfortunately, it seems as though farmers land on one side of the fence or the other on this issue. Some feel organic farming is the only way to go and others believe you're crazy to farm that way. As an Extension Agent it is my job to understand both systems and to help farmers produce crops regardless of their choice of production method; organic, non-organic or a combination of both. In reality it is good to understand the principles of organic production because when there is no chemical option to solve a crop production problem, only organic production strategies are left to choose from.

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Jim DeValerio
Agriculture, Community
Development and
Horticultural Agent
Bradford County
Extension Service
2266 N. Temple Ave.
Starke, FL 32091
Email: jtd@ufl.edu
Phone: (904)-966-6299

To find out more about all the programs your local Extension Office offers visit our website at:
<http://bradford.ifas.ufl.edu/>

[Building Blocks of Modern Agriculture:](#) Before learning about organic farming lets first learn about some modern farming practices that, miraculously, have been used to meet the world-wide food demand for the past 50 years by increasing the yield per acre from many crops. During the last century, the combined contributions of mechanized cultivation, commercial fertilizers, pesticides, plant breeding and research provided ever increasing crop yields.

[Pesticides:](#) During the 1970s a great awakening occurred: we recognized that although pesticides use increased crop yields, some also had disastrous, long term negative impacts. As a nation, we came to grips with the realization that it is possible to poison our environment. Dangerous compounds were removed from the marketplace and new chemistries were invented that targeted specific metabolic pathways of insects, weeds and other pests. Research constantly seeks to identify active ingredients to combat evolving pests. Pesticide use accounts for about 10% of the energy used to produce crops.

[Commercial Fertilizers:](#) The science of developing commercial fertilizers really took off when researchers developed a method of using energy to sequester and concentrate atmospheric nitrogen into a concentrated form. Nitrogen, used in high quantities by plants, is not mined like potassium and phosphorus. Over time, methods were developed to formulate concentrated blends of fertilizer that can satisfy the nutrient requirements in relatively small quantities compared with equivalent amounts nutrients from manures and other natural sources.

[Mechanization, plant breeding and economies of scale:](#) Using plant breeding, cultivars for major crops were developed that made it possible to farm large, uniform tracts of land that literally became food factories. Entire cropping systems were developed that utilize uniform pesticide and fertilizer requirements that can be mechanically planted, cultivated and harvested at predictable intervals. The ability to mass produce crops became the backbone of America's food supply and industrial agriculture.

[Research and development:](#) Although this article is short, the road to the advances outlined here is long and storied. Prior to the original green revolution, the American Land Grant University System was established by the Federal Government. This public university system along with the US Department of Agriculture has actively funded ongoing research related to all facets of plant and animal production. Many of these developments have been decades in the making.

[Genetically modified organisms:](#) *GMO's*, without a doubt, have contributed greatly to crop yields in the past 20 years. Scientist have successfully learned how to insert genes in plants that make them resistant to pests, diseases, drought, freezing or herbicides.

What is Organic Farming: In 1990, Congress passed The Organic Foods Production Act, part of the 1990 Farm Bill, requiring the USDA to develop national standards for organically produced agricultural products. This was done to assure consumers that agricultural products marketed as organic meet consistent, uniform standards. After ten years of debate and discussion, the final rule of the National Organic Program (NOP) was published in the Federal Register on December 21, 2000. http://edis.ifas.ufl.edu/document_hs212

Organic Farming can generally be described as a method of production that utilizes non-synthetic inputs and emphasizes biological and ecological processes to improve soil fertility and optimize pest management. <http://edis.ifas.ufl.edu/pdf/CV/CV11800.pdf>

Certified Organic Production: Production systems are certified by a USDA accredited agency. To be certified a farmer must:



- Use approved inputs for 36 months
- Design and follow an Organic System Plan to manage soil and pests
- No cross contamination with non-organic products
- Not use any transgenics (GMOs), municipal waste or ionizing radiation
- Not use any artificial flavors, colors or preservatives

What can be certified: Organic systems are certified. The agricultural products derived from those systems can bear the USDA NOP organic label. Agricultural inputs (like cow manure) are not "certified organic" but rather, they are "approved for use in organic production".



Value: The consumer gets traceable, consistent and independently verified products. The USDA label is similar to the USDA inspection label seen on meat products. In the same way consumers hold USDA inspected beef to a high regard, consumers who purchase certified organic products are assured of the methods used to produce their food.

Farmers benefit from Organic Certification when:

- They sell to affluent, educated or ethnic markets
- They sell to restaurants
- Their particular commodities are unusual or have a special visual or nutritional appeal
- If you are a new farmer and you are trying to establish a reputation
- They sell to indirect markets

Straight talk: The University of Florida/IFAS Extension's mission is to provide unbiased science based research to all producers regardless of their production method.

What is the difference between organic and non-organic production for Bradford County Farmers? In non-organic vegetable production systems soil fumigants are sometimes used to kill all soil organisms, including weeds, diseases, nematodes and beneficials. Furthermore, non-organic systems use concentrated, synthetic fertilizers that are readily available to plants. Since most Bradford County soils are mostly sand, almost all nutrients the plants use come from the synthetic fertilizers. Serious producers must determine to learn about soil fertility & fertilizers, to learn how to safely apply pesticides and to sell their produce for a profit.

It takes 3 years to start an organic farm. Research has proven that it takes three years to build soil by adding a combination of manures, composts and cover crops. During this time, a natural population of soil microbes will establish. This microbial population is critical to the development of soil that is a dynamic interacting system that slowly decomposes natural nutrients that are contained in the organic components of the soil. The food web is alive and is effected by soil moisture, aeration and temperature. A properly balanced soil is one that favors plant growth and inhibits soil pests and pathogens.

Farming is not for the faint of heart: Organic or not, margins are tight and it is very important for producers to know where they will sell their crop before it is planted and to also know how much it will cost to produce a crop. Your marketing plan needs to match your production plan.

In reality, most farmers integrate both organic and non-organic production principles so it is good for farmers to learn both methods. Eventually, farmers will find themselves in a situation where there is no chemical alternative to solve the problem. Most farmers in Bradford County do not use soil fumigants so they must rely on crop rotation and the development of a fertile soil to keep populations of harmful soil pests to a minimum. Likewise, with skyrocketing fertilizer costs, use of organic soil amendments may reduce input expenses. According to UF/IFAS research, every 1% increase of organic matter in the top 6" of soil is worth about 20 lbs N/Acre/yr.

Market forces drive production strategies. Most large-scale production methods have relied on cheap fuel and fertilizer costs, making it possible to grow food in one area and then truck it to several distribution points for sale. An increase of fuel and fertilizer costs may shift the economics in favor of locally grown food.