

Organic Feed-grain Markets: Considerations for Potential Virginia Producers

Denise Mainville, Assistant Professor, Agricultural and Applied Economics, Virginia Tech

Megan Farrell, Graduate Student, Agricultural and Applied Economics, Virginia Tech

Gordon Groover, Instructor, Agricultural and Applied Economics, Virginia Tech

Karen Mundy, Public Relations Specialist, Agricultural and Applied Economics, Virginia Tech

Introduction

Organic feed-grain has been identified as a potentially profitable crop for Virginia farmers. This publication is intended to help producers make informed decisions on whether to enter organic feed-grain markets by giving an overview of the market for organically produced feed grains, and issues for producers to contemplate as they consider entering the market.

Organic food sales have exhibited rapid growth in the United States, with an average 20 percent annual increase over the past ten years. While fresh fruits and vegetables constitute the largest organic food sector, organic meats, poultry, and dairy are experiencing the most rapid expansion. Organic dairy markets alone have been experiencing increases of approximately 20 percent a year (Born 2005). Growing demand in these organic market sectors opens opportunities to organic feed-grain growers throughout the United States, particularly for grain growers located near organic livestock, poultry, and dairy producing areas.

The Southeast has historically imported conventionally produced grains and is a minor producer in the organic grain market as well. Only 4 percent of the country's organic corn and 10 percent of organic soy come from the Southeast, making it the second lowest producing region after the Northeast (Born 2005). However, opportunities are increasing for growing organic feed grains for organic meat, poultry, and dairy farmers in the Southeast and Mid-Atlantic due to growing demand for these products in regional markets.

Recently, several large organic dairy processors have located in and around Virginia to meet the growing

demand for organic dairy products (Womack 2005). These dairy processors, such as Organic Valley, Horizon, and H. P. Hood, are currently importing their milk from as far away as southwestern states such as New Mexico, and are seeking local organic milk supplies for their processing operations.

Organic poultry markets are also expanding rapidly – combined with livestock, they grew 78 percent between 2003 and 2004 (Born 2005). Most of the feed grain grown in the South is used in poultry feeds, but much more is imported from the Midwest to meet feed requirements. The prices in Pennsylvania and North Carolina are clear indications of the shortage in organic feed grain. These prices are the highest in the U.S., averaging between 2.09 and 2.18 times the price of conventional grains in 2003 (USDA 2003).

Supplying organic feed to the growing markets for organic meats, poultry, and dairy offers market opportunities for Virginia farmers. A limited supply of organic grains is recognized as one of the primary impediments to the expansion of these markets. What is the potential organic grain market in Virginia? What does a producer need to know about growing and marketing organic feed grains?

What is “organic”?

In popular use, organic production is recognized as involving production methods that do not use synthetic inputs such as fertilizer, pest management, growth hormones, or sub-therapeutic or therapeutic antibiotics (see Organic farming and production methods on page 2). Under good management and giving systems time to

www.ext.vt.edu

Organic farming and production methods

What is organic farming?

Organic farming is an agricultural production system used to produce food and fiber. Management of the system relies on developing field biological diversity to disrupt the habitat for pest organisms and the maintenance and replenishment of soil fertility. Organic farmers are not permitted to use synthetic pesticides or fertilizers. An organic system includes design and implementation of an organic system plan that describes the practices used in producing crops and livestock products. It requires a detailed record-keeping system to track all products from the field to point of sale. Organic farmers are required to maintain buffer zones to prevent unintentional contamination by synthetic farm chemicals from nearby conventional fields.

How do organic farmers fertilize crops and control pests, diseases, and weeds?

Soil organic matter and nourishing living organisms in the soil contribute to good soil structure and water-holding capacity. The addition of cover crops, compost, and biologically based soil amendments help build soil organic matter and produce healthy plants that are better able to resist diseases and insects. Pests and diseases are primarily controlled through good plant nutrition and management. Cover crops and crop rotations help in effectively disrupting habitat for weeds, insects, and disease organisms. Weeds are controlled by crop rotation, mechanical tillage, and hand weeding, cover crops, mulches, and flame weeding. Organic farmers rely on a diverse population of soil organisms, beneficial insects, and birds to keep pests in check. Under the National Organic Program Rule, growers are required to use sanitation and cultural practices before they apply a regulated, strictly monitored, and documented material to control a weed, pest, or disease problem.

Source: *Organic Farming Research Foundation at www.ofrf.org*

equilibrate after transition, very little difference is found in crop yields between conventional and organic farming (Mortensen 2006). In fact, a nine-year study at the Leopold Center found greater yields and increased profitability in organically produced grains (Larson 2007).

Organic farming methods tend to be labor and management intensive, and they have long been associated with production on small farms. Just bringing land into organic production is costly, often requiring either that fields lay fallow or be farmed organically for three years without the opportunity to market yields as organic. After land is certified organic, management is generally more intensive than on a conventional farm. For example, many organic farmers walk fields daily and hand weed (Mortensen 2006), although standard farm equipment is typically used on larger-acreage organic farms (Larson 2007).

Historically, a diversity of organic standards and certification existed in the U.S. In 2002, however, the National Organic Program (NOP) standards took effect.¹ The NOP standards were a response to perceptions that the plethora of organic standards and certification used in the U.S. were confusing consumers and discouraging entry into the organic market, thus impeding the growth of the organic market itself. The NOP standards instituted a single, nationwide standard and requires that any product sold as certified organic in the U.S. obtain certification of adherence to this standard.

Getting and maintaining organic certification has four components: 1) a successful transition from conventional to organic land, 2) adherence to appropriate cultural practices, 3) maintenance of an Organic Systems Plan including documentation of cultural practices, and 4) maintenance of the organic integrity of a product by ensuring that inputs and postharvest practices also adhere to organic guidelines.

Transition of land from conventional to organic usually involves a three-year process. However, if land has been left fallow, this waiting period may be reduced or eliminated. During transition, land must be managed in adherence with organic practices; however, grains cannot be sold as organic until the transition is complete. This often presents a challenge to producers and reflects significant start-up costs, as yields often fall during the transition to organic as producers learn the techniques and improve their soil quality. This period

¹NOP standards are found at www.ams.usda.gov/nop/NOP/standards.html. The easiest link is the electronic code to the Federal Regulation (e-CRF) website. At that site you can easily scroll to the sections that most interest you. Topics include Introduction, Definitions, Applicability, Production and Handling, Labeling, Certification, Accreditation, and Administration.

can be financially trying because, despite higher production costs from adopting and learning new practices, organic price premiums are unavailable because products cannot be sold as certified organic until the transition is complete. Some of these transitional financial losses can be offset by labeling and selling products as “transitional organic” or “natural,” a practice which is not prohibited by the NOP standards and which may bring some price premium.

During and following the transition of land to permit organic certification, producers must maintain appropriate production practices established by the NOP standards and fully document their production practices, input use, and cultural activities. Improper or inadequate documentation, or documentation that reflects a failure to adhere to permitted organic practices, can result in a loss of organic certification. Although the documentation involved in maintaining organic certification is relatively involved, these procedures offer the farmer the opportunity to intensively study the farm operation and improve overall management.

Because of the necessity of maintaining the integrity and identity of organic products throughout the marketing chain, producers must be proactive in verifying the organic status of inputs, harvest equipment, and post-harvest transportation (Rzewnicki and Hamilton 2005). For example, producers should obtain documentation, such as an affidavit or copy of the service provider’s own organic certification, that trucks used to carry organic grain have been cleaned in accordance with organic standards.

Organic Grain Markets in Virginia

Two markets for organic feed-grain are emerging as dominant in the Southeast: organic dairy and organic poultry. In North Carolina and Virginia, two national organic dairy processors have obtained organic certification for milk processing plants and are seeking local producers to supply organic milk to these plants. Currently, much of the milk brought to these plants is imported from other states – one plant ships milk from as far away as New Mexico (Miller 2006). Continued growth in Virginia’s organic dairy sector will demand more organic grain to meet production needs. Peter Miller, a representative of one of the country’s largest organic milk processors, said, “The key to southeastern organic dairy success is local organic feed production.”

In response to the arrival of organic dairy processors, some Virginia farmers have already converted to organic dairy production, and numerous others are either contemplating doing so or are already in transition. These organic dairy farmers, as well as organic livestock and poultry farmers, need organic grain as an input to their production, stimulating a market for organic feed-grains in the region.

While organic grain producers can sell grain directly to dairy, poultry, or other organic livestock producers, they can also sell to one of several organic feed mills that operate in proximity to Virginia markets². Currently, most organic grain used in the Southeast is imported from the Midwest or overseas. Nationally, the U.S. imports eight times more organic grain than it produces (Clarkson 2006). Approximately 80 percent of imported grain comes from China and most of the remaining 20 percent comes from South America. Interviews with personnel at organic feed mills in Virginia and Pennsylvania indicate their interest in purchasing organic feed-grain locally to diversify their sources and reduce transport costs. In fact, transportation costs form a major component of the total cost of organic grain to organic farmers and processors. Current high fuel prices can enhance relative competitiveness. In the short to medium term, cost competitiveness of organic grains in Virginia will depend heavily on both production and transportation costs.

What feed grains do organic dairy, livestock, and poultry producers want?

As dairy farmers convert to organic, generally they will begin with a production system based on corn and soybeans because they are familiar with it, stimulating demand for organic corn and soybeans in the local market. As producers gain experience and see the effects of the organic production on their herds, they may switch to different grain and grass mixes that are easier for the cows to digest, resulting in better herd health and increased longevity (Miller 2006). This change is particularly true for those farmers who adopt the philosophy underlying the historic organic movement, for which sustainability and animal welfare are central.

This potential evolution in dairy production systems means that demand for alternative grains such as barley, oats, triticale, sunflower seed and meal, and field

²A list of organic feed-grain sellers in Maryland, Pennsylvania, North Carolina, and Virginia can be found in the Additional Resources section at the end of this publication.

peas is likely to emerge, in addition to the continuing demand for corn and soybeans. Establishing rotations that include these alternative grains can help organic feed-grain producers enhance profitability and help secure markets well in advance of harvest. Opportunities also exist for producing organic haylage and silage, which tend to be marketed locally because of their bulk and sensitivity to transport and handling conditions.

How much organic grain will be needed?

The organic dairy farm demand for grain will vary on the basis of the production systems that producers adopt, particularly how much grain they use relative to forage. The production systems that organic dairy farmers adopt will depend on five factors: 1) the farmer’s personal philosophy, 2) the stipulations of the processor that purchases the milk, 3) the cost of grain, 4) the availability of adequate forage, and 5) resolution of ambiguity in the NOP standards regarding forage requirements. Forage requirements play an important role in determining how smaller organic dairy farms, which have limited access to grazing land, will compete in organic markets. If forage requirements are specified so that farmers must allow their cows time to graze on open pasture, then smaller farms will need to have smaller herds than if organic forage could be brought to them in relatively more confined systems. Since Virginia mainly pastures its cattle compared to states with larger farming operations like Pennsylvania and New York, which use larger ratios of grain, Virginia would need relatively less grain (Miller 2006).

Little information is available about organic poultry production in Virginia. All three certified organic poultry and layer farms currently listed by Virginia Department of Agriculture and Consumer Services (VDACS) are small-scale, diversified operations, marketing directly to local buyers (VDACS 2005). Such operations may offer some limited local demand; and the overall market for organic grain for organic poultry in Virginia appears to be limited. Nevertheless, Virginia organic grain processors sell a large percentage of their organic grain to organic poultry producers in other states such as Florida. This means that while there may be limited opportunities to sell feed directly to organic poultry farms in Virginia, selling to organic feed processors does offer an inroad to these markets, both in- and out-of-state.

Organic Feed-grain Marketing

Significant differences exist between conventional and organic markets (Table 1). While some market risks, such as output price variability, are decreased relative to commodity grain markets, other types of risk can increase. Producers of conventional feed grains can take for granted that the services and inputs they need, such as seed, fertilizer, educational resources, and consulting services, will be readily available. In contrast, organic markets do not have well-established supply chains facilitating movement from farm to elevators/feed mills/processors to end user, particularly in Virginia where these markets are at an early stage of development. Thus, organic producers cannot take the

Table 1. Comparison of conventional and organic grain market structure

Commodity Grain Markets	Organic Grain Markets
Well-established input supply chain.	Minimal input supply chain.
Well-established public and private sector support for research, education, service, and product development.	Limited public and private support for research, education, service, and product development.
Mature industry – prices represent lowest cost producers.	New industry – price premiums reflect demand in excess of supply, and will tend downward as competition increases.
Transportation efficiency of unit-trains, barges, etc.	Transportation – truck and single rail car transportation qualified for organic grain transport are limited, increasing costs.
Well-established storage and processing infrastructure.	Limited storage and processing infrastructure – organic grains segregated, records required. Elevators must reap adequate returns to justify certification costs.
Well-established procedures for price risk management.	Limited opportunities for price risk management.

availability of inputs and services for granted. Though they are developing, the market for organic inputs and services is relatively limited, which can increase the costs that producers face. Likewise, research and educational programs dealing with the production and marketing of organic grain are also relatively limited.

The conventional grain market collects the product from many producers and coordinates the availability of this product with the demand of many buyers. Producers tend to have little control over the price they receive for their grain. Prices adjust to match the quantity supplied with the quantity demanded. Information on commodity prices is available to anyone interested. Furthermore,

conventional grain producers have a number of risk management tools available to them, such as futures, options, crop insurance, and various government programs. These mechanisms only work if the market has sufficient participants. After harvest, conventional grain producers typically sell their product to the local feed mill and receive a set payment for the volume of grain that falls within specific, pre-established grades and a different amount for grain of different grades.

In contrast, the organic grain market has relatively few producers and buyers in the market. While producers can use the risk management tools available for conventional grains, these currently do not provide the same

Crop Insurance

The Multi-Peril Crop Insurance Program (MPCI) is now available for organically grown insurable crops. Federal Crop Insurance (FCI) coverage and insurance premiums are based on average yield, number of acres per crop, and desired percent of reimbursement. A producer reports production for each field/crop for up to 10 continuous years. An average of the data is the base yield that will be used in figuring insurance coverage. If 10 years of data are not available, a figure based on the historic county average will be used instead. New farmers can claim 100 percent of the historical yield average; existing farmers can only claim 65 percent. Organic farms are not segregated or treated uniquely as far as historic yield averages are concerned. To date, no reimbursement premium is available for organic crop production. Policy payments are based solely on yield reduction, acreage affected, and average conventional commodity price.

Organic producers should apply for MPCI using a “Written Agreement,” which is a request for exception. These agreements are used to cover crops outside of their specific qualified area, and are currently also being written for organic crops. If a producer uses MPCI but doesn’t request a written agreement, then loss adjustment procedures that are used for conventional crops will be used. This means, for example, that if a loss would have been avoidable using conventional farming practices, that loss will not be covered by the insurance. The use of a Written Agreement supersedes the status quo and acknowledges the unique practices involved in organic production. To write a Written Agreement, a producer must first find a crop insurance agent. That agent will fill out a special form and work with RMA to write the agreement. FCI does not cover all crops. Crops are approved for particular states and counties. If a crop is not approved in your area but is in another, you may write a Written Agreement for that crop.

A pilot program called the Adjusted Gross Revenue Lite Program offers potentially greater protection to organic grain producers. The program is now offered in several counties in Pennsylvania, Connecticut, Delaware, Maine, Vermont, Massachusetts, New Hampshire, New Jersey, Rhode Island, West Virginia, New York, and Maryland. In this program, insurance coverage is based on the five-year average farm revenue listed on the IRS form 1040. This program will likely become available to producers around the U.S. within five years. Using average farm revenue will accommodate organic premiums in insurance coverage and reimbursement.

For more information or to find contact information for your area, go to the USDA’s Risk Management Agency (RMA) website or contact:

USDA/RMA/Stop 0801
Room 3053-South
1400 Independence Ave., SW
Washington, DC 20250
202/690-2803
Fax: 202/690-2818 or email: RMA_mail@wdc.usda.gov

Source: Born, H. (2004). “Organic Marketing Resources.” ATTRA attra.ncat.org/attra-pub/markres.html

level of protection as they do for conventional producers (for a broader overview of risk management options for organic grain producers, see Crop Insurance on page 5). Because much of the organic feed-grain is sold through contracts and is not subject to reporting, price sources are limited to calling local buyers, looking up retail prices for these feed grains, or using online resources such as New Farm (www.newfarm.org/opx/). The limited price information available shouldn't be assumed to be representative of all sales in the market. Generally, prices for organic feed grains are believed to be about double those of conventional feed grains. Such price premiums will last only until supply expands sufficiently to meet the demand, then prices will drop to closer to the cost of production.

Relationships with buyers are key for organic feed-grain producers' marketing strategies. The investment in time and energy put into establishing relationships with buyers can be significant but is necessary. Producers can capitalize on their time investments by maintaining good relationships with buyers. Failure to adhere to a contract with one buyer risks more than just that transaction – in markets such as the local market for organic grains, word gets around and a producer's performance on a contract with a single buyer can either build or tarnish his or her reputation and opportunities for future sales.

Contracts are commonly used in organic feed-grain sales. While many producers are willing to work with informal contracts that are verbal and "signed" with a handshake, a written contract is generally preferable. By clearly outlining the rights and responsibilities of each party, a written, signed document protects both the producer and buyer from any misunderstanding and avoids he-said-she-said situations in the case of problems. Contractual arrangements may be made well in advance of the buyers' actual delivery needs, possibly before the crop is even planted. Contracts should clearly specify volume, price, delivery, and other service obligations such as storage, drying, cleaning, and bagging. They should also specify payment terms and make provisions for arbitration to resolve issues should conflicts arise.

In an emerging market like the market for organic feed grains, producers should not let having a contract lull them into a false sense of security. If a buyer goes out of business or simply reneges on the contractual agreement, it can be difficult and even infeasible to enforce its fulfillment. Thus, producers should investigate potential buyers' reputations, track records, and financial solvency and also carefully consider the risk involved in committing output to a single buyer.

Other than the need for certification of compliance with the National Organic Standard, quality requirements for organic grain are similar to those for conventional grains (Miller 2006). Issues such as grain moisture levels, amount of foreign matter, and the presence of pathogens, such as fungi, mold, or aflatoxins, are important. Meeting buyers' quality requirements is crucial to good business. In the conventional grain market, grain that falls below grade will simply receive a lower price; in the organic grain market, it can result in failure to deliver on contract and the loss of a buyer and the producer's reputation.

Conclusion

Significant opportunities exist to produce organic feed grains to supply organic dairy producers and the rapidly expanding organic livestock and poultry sectors. As producers consider entering the organic grain market, they should research their opportunities thoroughly before converting to organic farming and attempting to sell organic feed-grain. Specific information on regional organic feed grain prices and contract conditions is scarce and is often not applicable across regions or even representative of the market from which it was drawn. These information limitations are due to the relative newness of the market, its continuing evolution, and many transactions taking place between parties that are not required to disclose sales information.

Ultimately, the success of the organic feed-grain market will depend on the continued success of organic feed-grain buyers, as well as local producers' ability to compete with other regions from which organic feed grains can be sourced. Recently, demand has been growing more rapidly than supply, resulting in significant price premiums over conventional feed grains. Over the longer term, an increase in production will cause the organic price premium to decrease, perhaps disappear altogether, as supply increases and prices fall. At the same time, high transport costs enhance the competitiveness of local organic feed-grain production. Nevertheless, the transition to organic production involves costly investment.

Entering the market for organic feed grains will present many challenges. New ventures and early adopters are usually characterized as risk-takers, and risk-takers are sometimes rewarded for their efforts. For successful new ventures, a good plan and constant re-evaluation and adjustment of the plan are essential. Dwight D. Eisenhower said, "The plan is nothing; it's the planning

that's important." This statement succinctly makes the point that a plan is neither a static document nor a finished process. To increase the chance of success, the planning process should begin with a complete business plan.

Production, marketing, and planning assistance can be sought from certifying agencies, other organic farmers, Extension agents; organic grain processors, universities, USDA's Economic Research Service, Applied Technology Transfer for Rural Areas (ATTRA), Sustainable Agricultural Research and Education (SARE), and organizations such as the Organic Consumers Association and Organic Trade Association. Because each of these resources interacts with different parts of the market, they can each provide different insights.

As more research is conducted on the market and as the market grows and stabilizes, more information will be available from Cooperative Extension and research institutions. In Virginia, producers can find some information on the Virginia Department of Agriculture and Consumer Sciences website (www.vdacs.virginia.gov). Information can also be sought from nearby markets (for example, North Carolina or Pennsylvania) if it is not available locally; however, producers should remember to take into account differences in market conditions such as the types and proximity of buyers, differences in costs, and the products and services traded.

Acknowledgements

The authors gratefully acknowledge the contributions of Mike Roberts, Farm Business Management Extension agent, Prince George County; Brian Jones, Crop and Soil Sciences Associate Extension Agent, Augusta County; and Wade Thomason, Extension Specialist, Department of Crop and Soil Environmental Sciences, Virginia Tech, who thoughtfully reviewed this publication.

Additional Resources

Further information about organic standards and possible changes can be found at the USDA website, www.ams.usda.gov/nop/NOP/Trade.html, or ATTRA, www.attra.org, an informational service that focuses on sustainable farming.

"Building a Sustainable Business: A Guide to Developing a Business Plan for Farms and Rural Businesses" at www.sare.org/publications/business/business.pdf.

SCORE at www.score.org

US Small Business Development Centers at www.sba.gov/sbdc/ then go to SEDC locator and choose the appropriate state.

ATTRA (2004). Kuepper, G. and L. Gegner. Organic Crop Production Overview at attra.ncat.org/attra-pub/PDF/organiccrop.pdf

ATTRA (2003). NCAT's Organic Crops Workbook: A Guide to Sustainable and Allowed Practices at attra.ncat.org/attra-pub/PDF/cropsworkbook.pdf

Organic Grain Dealers

Maryland

Nick's Organic Farm

Organic Soybeans and Corn
Mixes some poultry feed
Potomac, MD
Phone: 301/983-2167

North Carolina

Blount Feeds

Bill Blount
Hwy 64 E Alternate
PO Box 550
Bethel, NC 27812
Phone: 252/825-4491
Fax: 252/825-9274
E-mail: wlbount@earthlink.net

Braswell Milling Company

105 Cross Street
Nashville, NC 27856
Phone: 252/459-2143

Pennsylvania

Cornerstone Grain Processing

RD 1 Box 378
Robesonia, PA 19551
Phone: 610/693-5529

Fertrell's

Box 265
Bainbridge, PA 17502
Phone: 717/367-1566
Fax: 717/367-9319

Kreamer Feed, Inc.

PO Box 38
Kreamer, PA 17833
Phone: 570/374-8148
Fax: 570/374-2007
E-mail: Billy.Robinson@kreamerfeed.com
Website: www.kreamerfeed.com

McGeary Grain, Inc.

PO Box 299
Lancaster, PA 17608
Toll Free: 800/624-3279
Fax: 717/394-6931
E-mail: sales@mcgearygrain.com
Website: www.mcgearyorganics.com

Nature's Best Organic Feed

Route 522 N
PO Box 38
Kreamer, PA 17833
Phone: 570/374-8148
Toll Free: 800/767-4537
Fax: 570/374-2007
E-mail: Julie.Eriksson@kreamerfeed.com
Website: www.organicfeeds.com

Organics Unlimited

120 Liberty Street
PO Box 238
Atglen, PA 19310
Phone: 610/593-2995
Fax: 610/593-2155
E-mail: organicunlimited@onemain.com
Website: www.organicunlimited.com

Virginia**Countryside Natural Products**

1688 Jefferson Highway
Fishersville, VA 22939-9706
Phone: 540/932-8534
Toll Free: 888/699-7088
Fax: 540/946-8534
Website: www.countrysidenatural.com

Glenwood Foods, LLC

20850 Jackson Lane
Jetersville, VA 23083-2167
Phone: 804/561-3447, ext. 241
Fax: 804/561-3228
E-mail: gwoodfoods@aol.com

Source: National Organic Standards, Organic Feedgrain Producers and Handlers. www.ams.usda.gov/nop/Prod-Handlers/FeedProducers.html#VA

References

Born, H. (2005). "Marketing Organic Grains." ATTRA: 16. <http://attra.ncat.org/attra-pub/PDF/marketingorganicgrains.pdf>

_____ (2004). "Organic Marketing Resources." ATTRA: No. 124. <http://attra.ncat.org/attra-pub/markres.html>.

Clarkson, Lynn (2006) "An Industry Perspective on Changing Grain Markets and the Role of Public Policy." Presentation at *Guiding Food and Agricultural Marketing Policy in the Face of Changing Market Structures*. Sponsored by Food and Agricultural Marketing Policy Section, American Association of Agricultural Economists, Arlington, Va., March 21-22.

Hungerford, C. (2003). "USDA study of organic feedgrains reveals they are available and affordable," *The New Farm*.

Larson, A. (2007). Yields increase, Soil Resilience Soars; Long-Term Research Proves Organic Promise. Leopold Center Summer newsletter. Found at www.leopold.iastate.edu/pubs/nwl/2007/2007-2-leoletter/ltar.htm

McLaughlin, Caragh (2006). "Organic Dairy Markets; Identification of Market Segments." Presentation at Dairy Marketing Research Symposium. Sponsored by Southwest Dairy Center, Forth Worth, Texas, March 6.

Miller, P. (2006). Organic Dairy Demand for Organic Grain in Virginia. *Organic Grain Opportunities for Virginia Grain Growers*. M. a. Farrell: Conference call from Virginia Tech to Peter Miller, the Regional Manager for the Northeast Region of Organic Valley.

Mortensen, P. D. (2006). Organic Feed Conference, Dayton, Va.

Rzewnicki, P., and M. Hamilton (2005). Organic Field Crop Production and Marketing in North Carolina. North Carolina State University. Found at www.organicgrains.ncsu.edu/production/productionguide/NCorgprodguide.htm

USDA (2003). Organic feed for poultry and livestock: Availability and prices. www.ams.usda.gov/nop/Prod-Handlers/FeedStudyJune2003.pdf

USDA (2005) U.S. certified organic livestock, 2005, by State. www.ers.usda.gov/Data/organic/

Virginia Department of Agriculture and Consumer Services (2005). A guide to Virginia's Certified Organic Growers.

Womack, R. (2005). Strong demand spurs organic dairying in Virginia, the South. *The New Farm*. August 2005.