Proceedings of the Workshop:

"Organic Farming and Marketing Research - New Partnerships And Priorities"

Held Thursday, October 29, 1998
at the offices of
USDA Cooperative State Research, Education and Extension Service
Washington, D.C.

Co-Sponsored by:
the Organic Farming Research Foundation,
the United States Department of Agriculture, and
the Henry A. Wallace Institute for Alternative Agriculture

Proceedings by
the Organic Farming Research Foundation's
Scientific Congress on Organic Agricultural Research (SCOAR)

Edited by Mark Lipson and Todd Hamner

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TABLE OF CONTENTS

****	**Introduction** Mark Lipson & Todd Hamner, Eds.	4
Speaker #1:	**The Scientific Congress on Organic Agricultural Research** Mark Lipson, Organic Farming Research Foundation	5
Speaker #2:	**1998 Organic Research Initiative Legislation** Mark Keating, Henry A. Wallace Institute for Alternative Agriculture	17
Speaker #3:	**Sustainable Development and Small Farms** Adela Backiel, USDA, Office of the Chief Economist	19
Speaker #4:	**Organic Research in the SARE Program** Jill Auburn, USDA, Sustainable Agriculture Research & Education	19
Speaker #5:	**Organic Research in Michigan** Susan Houghton, Michigan Organic Food and Farm Alliance	20
Speaker #6:	**Research Needs from the Farm Inspector's Perspective** Jim Riddle, Independent Organic Inspectors Association	22
Speaker #7:	**The Alternative Farming Systems Information Center** Mary Gold, USDA, National Agricultural Library	25
Speaker #8:	**ARS National Programs and Organic Agriculture** Mike Jawson, USDA, Agricultural Research Service	26
Speaker #9:	**Organic Research at the Beltsville Research Center** John Teasdale, USDA, Agricultural Research Service	27
Speaker #10:	**The ARS Long-term Farming Systems Project** Mark Davis, USDA, Agricultural Research Service	31
Speaker #11:	**The Economics of Organic Grain Production in the Midwest** Rick Welsh, Henry A. Wallace Institute for Alternative Agriculture	33
Speaker #12:	**ARS Research on Microbial Pesticides** Michael McGuire, USDA, Agricultural Research Service	35
Speaker #13:	**Meeting the Data Needs of the Organic Industry (Part 1)** Catherine Greene, USDA, Economic Research Service	42
Speaker #14:	**Meeting the Data Needs of the Organic Industry (Part 2)** Norman Bennett, USDA, National Agricultural Statistics Service	44
Speaker #15:	**Meeting the Data Needs of the Organic Industry (Part 3)** Terry Long, USDA, Agricultural Marketing Service	45
Speaker #16:	**Beginning to Understand Organic Markets** Barry Krisoff, USDA, Economic Research Service	46
Speaker #17:	**Price Premiums for Organic Fresh and Processed Foods** Ann Vandeman, USDA, Economic Research Service	47
Speaker #18:	**International Issues Pertaining to Organic Agriculture** Janise Zygmont, USDA, Foreign Agricultural Service	52
Speaker #19:	**Local, Grass-fed Beef: Production and Marketing Concerns** Jenny Warden, Piedmont Farm Marketing Project	55
Speaker #20:	**Greening the Food System** Ann Thrupp, World Resources Institute	55
****	**SPEAKER CONTACT INFORMATION**	62

Introduction

This workshop, **"Organic Farming and Marketing Research - New Partnerships and Priorities"** was held October 29, 1998 at the USDA Aerospace Center in Washington DC. It was organized to explore the current status and future prospects for organic agricultural research and education within USDA and elsewhere. This was the first USDA-sponsored public meeting on research priorities devoted specifically to organic farming since at least the late 1970s. As such, it is an important benchmark for the acceptance of organic agriculture by the federal government and the national research system.

The meeting came about from informal discussions during the summer of 1998 among USDA agency personnel, and representatives of non-governmental organizations seeking to cultivate an organic research capacity within USDA's programs. Dr. Jill Auburn, Director of the USDA Sustainable Agriculture Research and Education (SARE) program, and Catherine R. Greene, IPM Specialist for USDA's Economic Research Service, agreed to host the meeting and organize the program. Mark Lipson, Policy Program Director for the Organic Farming Research Foundation provided the keynote material and organized the publication of this transcript. Mark Keating and Rick Welsh of the Henry A. Wallace Institute for Alternative Agriculture supplied co-sponsorship of the event and core program material.

OFRF's 1997 study *Searching for the "O-Word,"* documented the scarcity of dedicated organic research within the USDA system. Despite the historic absence of dialogue about organic research and market data collection, this meeting produced an impressive array of reports on research and data collection in progress, or on the drawing boards. Given the short time frame for recruiting participants to this meeting, we think that this is only a sample of the "new partnerships and priorities" that are ready to emerge in the field of organic agricultural research.

More than anything, these presentations allude to the myriad questions about organic agriculture which are in need of serious scientific investigation. Collecting and organizing these questions, hypotheses and problem statements is the goal of OFRF's newest project, the "Scientific Congress on Organic Agricultural Research" (SCOAR). This workshop therefore also marked the beginning of the SCOAR project and this transcript is the first “official” SCOAR product.

A basic principle of the SCOAR project, reflected in this meeting, is peer-level dialogue among growers, research scientists, and extension educators. The presenters and audience of this workshop -- including farmers, government and university researchers, and grass-roots activists – spanned a broad spectrum of professional interests and practical knowledge. Despite this diversity, the participants shared a sense of exploration into uncharted territory, where the observations and questions of farmers and activists weigh equally with those of academic scientists and administrators. This exemplified the "level-learning field" which we are seeking to create in the Scientific Congress.

To stay updated on future SCOAR events or for further information please go to the OFRF website at: <http://www.ofrf.org/policy/scoar.html > or contact Mark Lipson at (831) 426-4006, or email <mark@ofrf.org>.

The Scientific Congress on Organic Agriculture Research: Building a National Research Agenda

Keynote Speaker: Mark Lipson
Organic Farming Research Foundation

Good afternoon. This is an auspicious occasion: it's the first official USDA public meeting specifically focused on research and data collection for organic farming. I could be wrong about that, but it certainly marks the beginning of an important new phase with respect to the Department's attempts to begin dealing with organic farming research and dealing with the organic farming community. I'd like to express my enormous gratitude to Cathy Greene and Jill Auburn for helping arrange this workshop, and also to the Wallace Institute.

Now, I'm officially inducting all of you into the Scientific Congress on Agricultural Research, or "SCOAR." This is the next phase of OFRF's efforts to promote organic farming research. It is intended to be a collaborative process between the producer community and the scientific research and educational community to build the scientific agenda for organic farming, for organic agriculture, in all phases: production, marketing, and its integration with rural development. We're calling it a "Congress" because we intend to conduct a series of regional meetings around the country, leading to some sort of national meeting to ratify a research agenda. Beyond that specific product, we are really trying to build an ongoing network between scientists and organic producers. (I considered naming the project, "the Scientific Network for Organic Agriculture Research", but then the acronym would be "SNOAR." I don't think that would motivate much participation.)

So, for OFRF the beginning of the SCOAR project is the context in which we're having this meeting today. We're trying to build the dialog and this is a tremendous start, I think, to begin to do that.

What I'm going to do today is run through very quickly the latest results of our National Organic Farmers Survey, which OFRF conducts every other year. We're just about to publish the results of the 1997 survey. On the table over here, with all the other handouts, are copies of the Executive Summary of the results and a one-page order form for obtaining the full results.

First I will just say quickly, how we got here, to this point. A year ago we published the booklet, *Searching for the "O-Word,"* which was the Research Foundation's attempt to identify organic farming research that was taking place within the federally-funded research system.

The tool that we utilized to do that was the CRIS database — USDA's Current Research Information Service. CRIS doesn't encompass everything that's going on. It probably wouldn't even encompass all the projects you're going to hear about in this room today. But, nevertheless, it is the most comprehensive database of federally funded research projects and a very good indicator of the overall presence of dedicated organic research within the system. Our study was more or less centered on the 95-96 fiscal year, but CRIS includes projects running for a number of years around any given point.

In this study, the dedicated organic projects that we identified constituted only about one-tenth of one percent (0.1%) of the USDA research portfolio, as represented by both the numbers of projects in CRIS and also in terms of budgetary allocations. That is, only 34 projects out of 30,000 were *bona fide* studies of organic farming systems. For the 95-96 budget year, these projects

totaled less than $1.5 million, if you kind of stretched it, out of about $1.8 billion in federal appropriations for agricultural research.

However, the few projects we did find are the beginning of an important core of research work that's going on within the ARS and the Land Grant system. We identified 34 projects which we called "Strong Organic" — that is, they were specifically dedicated to organic farming systems research; and another 270 projects that we called "Weak Organic" research, where the CRIS report indicated that those projects were compatible and pertinent to organic farming, but weren't described specifically in the context of an organic agricultural system. The context is the important point. And that's what we are going to try and focus on as we continue to go through this process — research that is undertaken specifically in the context of an organic system.

Following the publication of *Searching for the O-Word,* this meeting perhaps represents "Starting to Find the 'O' Word" — no longer having to search for it quite so hard. I hope that will prove to be true. Now on to our survey results.

1997 OFRF Organic Farmer Survey Summary

This will be the fourth survey that OFRF has conducted of organic producers — the third that is nationwide. We've done it every two years since 1993. I'm going to start quickly with just some pieces of the demographic data — who the organic farming community is and what they're doing, then move into production practices and finally research priorities. There are 60 questions overall in the survey itself. I'm maybe going to cover about twelve or fifteen of them at most.

The main reason that we started doing this survey, when the Foundation was started by growers seven years ago, was to feed into our program of grant-making for on-farm organic research projects. That's actually the main thing that the Foundation does: raise money and give it out for on-farm research projects to advance the state-of-the-art of organic farming practices. And so the survey initially was a tool for us to find out what growers' problems and research priorities were.

We sent this to all the certified organic farmers in the country that we could identify, which was about 5,000, and we did that by getting the list from all the certification organizations in the country that would give them to us. A handful didn't, so we estimate that right now there are maybe about 6,000 certified organic growers (defined as those that have engaged an independent verification agency to validate their organic claim.) There may be as much as twice that number of growers who are actually participating in the organic market. That is, probably only about half the organic growers right now are actually certified by an independent third party. So we sent out about 5,000 surveys. We got back 1192. That is a return rate of about 26 percent, which we're pretty happy with.

We will be able to do breakouts of this data by region and by state, and do cross-tabs with other aspects of the survey. Not all that is actually going to be in the initial publication of results, but all that is available to you folks in the research system and to growers around the country. We're very much looking forward to people asking us to do cross-tabs and breakouts for them.

Audience: Can I ask you a question on the other growers who weren't sent the survey? Why would you estimate that 50 percent of all organic growers are not certified?

Mark: Well, it's an educated guess. In California where there is a registration program required for all growers actually a little less than half are certified by an independent third party and

that's one benchmark, which is corroborated by the experience of a number of people, I think. One of the big needs that we have is to identify what the rest of that population is. The implementation of the federal regulation will require mandatory certification for everybody over $5,000 in sales, so hopefully next time around that we do this, we'll have a much more complete universe to survey.

The age of organic farmers (**Table 1**): The average age is 47-1/2 years — quite a bit younger than the national average of farmers according the Ag Census data, which I think indicates that a little under 60 years old is the average age of farmers overall.

Table 1: Age of Certified Organic Farmers

# of respondents	%	Response category
2	<1%	<=20 years of age
58	5%	21 to 30 years of age
241	20%	31 to 40 years of age
467	39%	41 to 50 years of age
267	22%	51 to 60 years of age
100	8%	61 to 70 years of age
41	3%	>70 years of age
16	1%	No response

Next are the **types of crops and products** (**Table 2**): 57 percent of the growers are doing vegetables. Over half of them also are doing field crops. Tree and nut crops about 40 percent. 30 percent are doing some type of value-added processing or further packaging of their products. 27 percent are engaged in some type of livestock production. And in the survey this is all broken down in enormous detail. There are 20-30 items under each of these general categories with specific numbers in the survey results.

Table 2: Type of Crops Produced by Certified Organic Farms

Type of crop/product	% of respondents producing
Vegetables/flowers/ornamentals	56.6%
Field crops	52.2%
Fruits/nuts/tree crops	39.8%
"Value added" products	31.1%
Livestock & animal products	27.0%

Here's a snapshot of farm acreage. **Average organic acreage (Table 3)** farmed is 164. The median farm size is somewhere around 25 acres, somewhere between 15 to 30 acres. In general, organic farms are quite small. You'll see that in the income data in a second.

Table 3: Number of Acres Farmed - Certified Organic & Total Acreage

Farmers were asked to indicate (fill in) the number of acres that they currently farm that applies to the following categories.

# of responses	Category	Average	Total	<=2	> 2 to 5	> 5 to 15	> 15 to 30	> 30 to 50	> 50 to100	>100 to 500	> 500 to 1000	> 1000
1183	Acres farmed, total	208	245, 529	143	153	189	113	84	128	263	60	50
1182	Organic acreage	140	164,966	161	163	201	135	85	128	247	34	28

Now, this **farm income data** (**Table 4**) is particularly important with respect to the organic standards that are still underway in their re-drafting. This shows farm income from organic sales. As the USDA National Organic Program staff estimated, the survey shows that about 25 percent of organic growers have less than $5,000 in annual sales of organic products. So there is a very large proportion of very small producers. I don't have the time series data on this from the previous survey but it is kind of interesting. There is a gradual upward expansion of organic farm size.

Table 4: Gross 1997 Farm Income From Organic Products

# of respondents	%	Response category
81	7%	No income or loss
236	20%	Less than $5,000
251	21%	$5,000 to $14,999
174	15%	$15,000 to $29,999
121	10%	$30,000 to $49,999
113	9%	$50,000 to $99,999
98	8%	$100,000 to $249,000
40	3%	$250,000 to $499,999
12	1%	$500,000 to $999,999
18	1%	$1 million to $4.9 million
4	<1%	$5 million to $19.9 million
1	<1%	Over $20 million
43	4%	No response

Here's a snapshot of **where the markets are** (**Table 5**) for organic growers. There's still a lot of room for expansion basically, particularly at the supermarket level. Also, this data doesn't

indicate it directly, but we know that there is a tremendous amount of growth going on at the direct-to-consumer and direct-to-retail levels as well.

Table 5: Breakdown of Market Outlets for Organic Farm Products in 1997

		Responses	% sold	Category
		357	11.31%	Direct on-farm/farm stand
34.7%	Marketed	363	15.35%	Farmers market
	Direct-to consumer	132	4.7%	Community supported agriculture/subscription
		22	.7%	Mail order
		17	.9%	Other farmers
		74	1.73%	Other
		362	8.89%	Natural food store/food co-op
17.5%	Marketed	130	2.41%	Local supermarket
	Direct-to-retail	229	4.97%	Restaurants
		48	1.19%	Other
		105	3.04%	Natural food store chain
47.9%	Marketed	44	1.21%	Supermarket chain
	Wholesale	124	7.28%	Producer cooperative
		196	12.25%	Processor or packer
		66	3.43%	Private grain elevator
		318	18.27%	Handler, broker or distributor
		51	2.37%	Other

Table 6: Organic Farm Products that Reached Export Markets

# of responses	%	Category
746	63%	No products reached foreign markets
154	13%	Uncertain whether products reached foreign markets
54	5%	Products reached foreign buyer through direct sales
179	15%	Products reached foreign buyer through U.S. intermediary
76	6%	No response

Here (above) is a little bit of information about **export sales** (**Table 6**). An interesting piece of the pie. Still quite small overall from the producer's point of view, but again one that we know is growing.

We asked questions about **what growers expected in the future** (**Table 7**) and how they intended to change their marketing strategies and what their plans were in terms of growth of number of products, volume of crops and products sold. Certainly this was showing a great deal of confidence in further growth by the producer community at the end of 1997.

Table 7: Future Plans for Changes in Organic Marketing Strategies

# of respondents	Would like to decrease	Would like to stay about the same	Would like to increase	Category
720	2%	21%	77%	Sales at local level
558	5%	35%	60%	Sales at regional level
472	10%	49%	41%	Sales at national level
457	12%	49%	39%	Export sales
681	3%	23%	74%	Direct-to-consumer marketing
598	4%	32%	64%	Direct to retail marketing
618	13%	38%	49%	Wholesale marketing

Now here is a big "teaser": We asked for **price and yield data** (**Table 8**) for all the crops that the growers produce. I'm showing just crops starting with the letter "A." There are about 120 crops in this list and it shows minimum prices received, maximum prices received, median prices received, and the same spread with yield data, as well as the number of growers who responded within each crop. I just wanted to give you a taste of the depth of data that's available in the survey. Literally every agricultural product you can think of probably is on this list. Maybe in this room, you people can think of one that's not on there, but if organic growers are doing it, we do have it on this list.

Table 8: Certified Organic Farms - Yield and Price Data for 1997

Total resp. #		Yield calc #	1997 Yields Lowest	Highest	Median	Price calc #	Price received, 1997 (in dollars) Lowest	Highest	Median
15	Alfalfa	14	1.5 tons/ac	7 tons/ac	4 tons/ac	12	30.00/ton	200.00/ton	80.00/ton
4	Almonds	4	200 lbs/ac	1,400 lbs/ac	1,200 lbs/ac	3	2.95/lb	4.85/lb	3.00/lb
3	Amaranth	2	3 bu/ac	10 bu/ac	** 1	1.00/bu	1.50/bu	1.35/bu	
50	Apples	13	80 bu/ac	1,000 bu/ac	400 bu/ac 12	3.80/bu	40.00/bu	20.00/bu	
	"	43 tons/ac		20 tons/ac	10 tons/ac 6	80.00/ton	2,000./ton	200./ton	
	"	96 bins/ac		69 bins/ac	40 bins/ac 8	65./bin	425./bin	160./bin	
4	Apricots	2	3 tons/ac	18 tons/ac	**	--	**	**	**
	" 1	**	**	**	400 box/ac 1	20.00/box	25./box	22.50/box	
1	Artemesia	--	**	**	**	1	2.00/lb	6.00/lb	3.00/lb
2	Arugula	--	**	**	**	1	19.00/cs	25.00/cs	21.00/cs
	" 1	**	**	12,000 lbs/ac	1	4.00/lb	6.00/lb	4.50/lb	
7	Asparagus	4	600 lbs/ac	2,300 lbs/ac	1,500 lbs/ac	6	.99/lb	2.75/lb	1.50/lb

Next is a sample of questions that we asked about **management problems** (**Table 9**). This is just the top of the "insects" category — actually the list is about three times as long as what I'm showing here. This indicates the most problematic insect pests and what growers' degree of difficulty is in dealing with them. The two top pests, Cucumber Beetles and Flea Beetles, historically have received very little attention in the research system because they're usually not part of the pest complexes in a chemical intensive system. But if you start taking insecticides out of the system, these are the pests that very many organic growers encounter — throughout much the country.

Table 9: Pest Management: Problem Identification & Management Difficulty

Insects: 212 insects or types of insects were identified.

Category	Total number of responses	Able to manage adequately	Moderate difficulty managing	Serious difficulty managing	Management difficulty not indicated
Cucumber beetle	156	17%	42%	36%	5%
Flea beetle	143	10%	48%	38%	4%
Aphids	126	33%	50%	12%	5%
Colorado potato beetle	120	31%	40%	26%	3%
In general	**89**	**68%**	**25%**	**6%**	**1%**
Codling moth	66	21%	32%	47%	0%
Leafhopper	61	13%	42%	44%	1%
Grasshoppers	57	28%	35%	37%	0%
Squash bug	46	8%	24%	**65%**	3%
Mites	37	38%	43%	14%	5%
Nematodes	36	19%	36%	39%	6%
Mexican bean beetle	34	12%	35%	44%	9%

Table 10: Organic Insect Pest Management Strategies and Materials

Total # of responses	Never	Rarely or as a last resort	On occasion	Frequently or regularly	Category
1087	18%	1%	7%	74%	Crop rotations
1037	39%	5%	18%	38%	Beneficial insect habitat
967	60%	7%	12%	21%	Beneficial vertebrate habitat
1045	43%	12%	27%	18%	*Bacillus thuringiensis* (Bt)
1031	61%	10%	18%	11%	Beneficial insect, mite or nematode releases
1032	65%	11%	13%	11%	Dormant or summer oils
1046	49%	18%	23%	10%	Insecticidal soaps
1045	52%	21%	18%	9%	Botanical insecticides (e.g. pyrethrum, rotenone, ryania, sabadilla, quassia, neem)
990	60%	13%	18%	9%	Trap crops
1014	78%	6%	8%	8%	Pheromones or mating disruption
995	95%	3%	1%	1%	Viral pathogens (e.g. granulosis virus…)

These are the **materials and strategies that growers use to deal with insect pests** (**Table 10**). Of important note here, the use of Bt (Bacillus thuringiensis) is the most important off-farm or non-systemic management strategy for dealing with insect pests. And amidst our excitement about starting to get more attention from the research system and of course what's going on in the marketplace, this is a very serious cloud that's looming over organic producers: the imminent loss of Bt's effectiveness due to resistance induced by widespread use of the recombinant-DNA Bt crops. Personally, as a grower, I'm extremely concerned about this and I think it's going to be a huge problem for growers in the next ten years. Again, this is just a sample of what's in this section of the survey. There's five or six different categories in this "Management Strategies" section. Within each category, there's as many as ten or fifteen items listed for growers to rank.

Obstacles to organic marketing (**Table 11**): Pretty strongly on top of the list is, "consumers don't have good understanding of what the organic label means." So that educational mission is an important one to growers and then a whole host of other issues fall in behind that.

Table 11: Current Constraints to Marketing Organic Products

# of respondents	Not a constraint or problem 1	2	3	4	Serious constraint or problem 5	Ranking	Category
1139	14%	15%	25%	25%	21%	3.25	Lack of consumer understanding about organic food
1131	24%	17%	23%	20%	16%	2.87	Lack of organic marketing networks
1126	20%	21%	27%	20%	12%	2.84	Inability to find best price
1129	27%	16%	24%	19%	14%	2.78	Distance between producer and market or delivery point
1144	32%	19%	19%	17%	13%	2.61	Finding organic markets
1122	33%	20%	20%	14%	13%	2.55	Competition with unverified "claimed" organic

This is a compilation of **current constraints to production** (**Table 12**): what growers feel are the most important obstacles for them in being able to produce successfully. Number one is the cost of inputs, which includes fertility inputs as well as pest management and other types of inputs. One of the points that we tried to make in *Searching for the "O-Word"* is the idea of reducing the capital cost of organic matter. This is an enormous problem that the research and development system needs to tackle and is something that's never really been systematically worked on.

Assessing **research priorities** has been our main objective with the Survey, and we've asked growers about this in a number of ways. I'll show you just some of the different versions here. First here, (**Table 13**) we ask the growers to state directly, in their own words, what are the **most important areas for organic farming research.** Weeds are the single biggest research priority that growers state: weed management strategies that are effective within the context of an organic system. This has been the case in each of the surveys we've done. Right up there with it, very interestingly, is "whole farm design," which lumps together statements like "whole farm planning," "ecological integration," or "developing a more holistic approach to [their] farming system." I think actually that's a fairly remarkable indicator of where the thinking of organic growers is and what

they're looking for from the research system, so I think that's an enormous challenge for the research system to try and get a handle on.

As you can see, not all these issues are production issues *per se* — the issue of "nutritional quality as a function of growing practices" is something that has been very important and near the top of all our lists for each of the surveys that we've done.

Table 12: Current Constraints to Organic Farm Production

# of respondents	Not a constraint or problem 1	2	3	4	Serious constraint or problem 5	Ranking	Category
1126	18%	14%	23%	25%	20%	3.13	Cost of organically allowable inputs
1126	22%	14%	21%	18%	24%	3.08	Uncooperative or uninformed extension agents
1119	21%	16%	23%	22%	18%	3.02	Distance or transport of organically allowable inputs
1124	24%	17%	26%	21%	12%	2.82	Sourcing or finding organically allowable inputs
1130	26%	18%	22%	22%	12%	2.78	Achieving desired yields
1131	26%	27%	22%	17%	8%	2.56	Information on organic practices unavailable or hard to find
1118	28%	23%	24%	17%	8%	2.54	Effectiveness of organically allowable inputs and methods
1130	32%	26%	24%	11%	7%	2.35	Personal lack of knowledge about organic practices
1131	56%	15%	13%	9%	7%	1.97	Social pressure from other farmers or community to farm conventionally
1098	67%	10%	10%	5%	8%	1.76	Pressure from lenders to farm conventionally

Table 13: What are the Most Important Areas of Organic Farming Research?

#	Category
122	Weed Control (mulching/tillage/competition/etc.)
122	Whole Farm Planning & design (ecosystem integration/permaculture)
139	Interdisciplinary/Systems
104	Applied Organic Fertility Management (techniques, rates)
100	Nutritional quality vs. growing practices (residues/health effects/etc.)
55	General Organic Pest Control (insect and disease)
42	Soil Health & Quality Indicators (systemic relationships)

Next is the format in which we ask the same question about **research priorities** slightly differently (**Table 14**). We give them a list of about 30 topics and ask them to rank these in

importance. Again weeds show up at the top and then the more holistic concerns: trying to define the systemic relationships and identifying how to manage and improve those relationships. Again, it's just the top piece of that list.

Table 14: Ranking of Organic Farming Production Research Topics

1997 Ranking	1997 combined average ranking	Previous years' rankings 1995 (out of 27 categories)	1993 (out of 28 categories)	% of respondents ranking as "6" or "7" (highest priority)	# of respondents per category	Research topic category
1	**5.56**	--	--	62%	1,163	Weed management
2	**5.49**	4	3	57%	1,160	Relationship between fertility management and crop health, pest & disease resistance
3	**5.30**	1	2	54%	1,138	Relationship of organic growing practices to nutritional value of product
4	**5.25**	7	5	47%	1,159	Soil biology (e.g. microbiology, earthworms, etc.)
5	**5.23**	2	4	54%	1,163	Crop rotations for fertility and pest management
6	**5.23**	5	9	50%	1,155	Cover cropping, green manures
7	**5.08**	--	--	44%	1,165	Management of insect pests, other arthropods, or nematodes
8	**5.03**	--	--	42%	1,155	Management of plant diseases
9	**4.94**	12	8	40%	1,158	Habitat management for pest management
10	**4.80**	17	17	41%	1,136	Food safety issues (e.g. *E. coli*, salmonella…)
11	**4.75**	15	14	39%	1,155	Compost, compost teas, vermiculture
12	**4.71**	--	--	37%	1,156	Tillage systems (including no-till)
13	**4.67**	11	12	34%	1,153	Soil conservation and restoration
14	**4.67**	14	15	38%	1,149	Farm equipment for organic production practices
15	**4.62**	--	--	41%	1,126	Whole farm systems design (e.g. beneficial cropping, livestock relationships, water & energy conservation, reducing off-farm inputs)
16	**4.36**	16	16	28%	1,153	Intercropping, companion planting, plant guilds
17	**4.34**	20	13	31%	1,137	Whole farm systems, interdisciplinary approaches
18	**4.31**	--	--	33%	1,146	On-farm value-added processing systems
19	**4.29**	--	--	27%	1,151	Mulching systems
20	**4.23**	25	23	26%	1,148	Post-harvest handling methods
21	**4.08**	22	18	25%	1,147	Plant breeding & varietal testing for organic systems
22	**4.00**	--	--	24%	1,147	Irrigation & water use
23	**3.64**	26	27	23%	1,142	Greenhouse production methods
24	**3.52**	6	21	25%	1,128	Animal preventive health
25	**3.47**	10	19	23%	1,130	Homeopathic/ natural animal medications
26	**3.44**	23	22	15%	1,145	Detection of pesticide residues in soil/water/plant material
27	**3.39**	--	--	21%	1,125	Rotational grazing &intensive grazing
28	**3.30**	18	26	19%	1,135	Animal nutrition, feed and supplements
29	**3.04**	21	28	14%	1,129	Humane animal production practices
30	**3.00**	--	--	13%	1,120	Alternative animal production systems
31	**2.97**	--	--	15%	1,118	Breed selection & genetics for organic livestock systems
32	**2.95**	--	--	13%	1,128	Alternative animal shelter systems

Next, one of the things that we try to assess is growers' **interest in participating in on-farm research** (**Table 15**). There's actually quite a bit of material in this section of the Survey. This is just one little slice off the top. One of the great pieces of potential in the Survey is that we ask growers, specific growers who are filling out the survey, "can we give your name to researchers who are interested in studying the problems that you specified?" So we have a list of hundreds of growers who are ready to be matched up in a "dating service" with researchers who want to do on-farm research on particular problems. And that is also the essence of what we're talking about in terms of a collaborative scientific congress.

Table 15: Interest in Participating in On-Farm Research

Response	1997 # of Respondents	1997 n =1192 %	1995 n=945 %
Yes	732	61%	67%
No	412	34%	28%.
No response	48	4%	5%

Another thing we're very concerned about: **how do growers get information** (**Table 16**)**?** What's the most useful way to provide information to them and where are they going for their information now? Of course, one of the things that this has been telling us consistently is that organic growers don't feel they get very much help from the university researchers and from extension. It is very clearly stated in several ways in the Survey, that they don't feel that the extension service is really helpful to them in answering their questions about organic management.

Table 16: Best Sources for Obtaining Organic Production Information

# of responses	Favored information resources
228	Periodicals
186	Other farmers
104	Books
66	Conferences, seminars and workshops
62	Cooperative extension service
55	From their organic certification inspector
48	Publications
48	Websites, the Internet
42	Field days or on-farm demonstrations
39	University researchers
27	Growers' associations
26	Suppliers/vendors

The data on information sources is separated into several categories of source-types, such as **"places and things where organic growers get information."** And below the surface of this we ask for specific items: which books? which periodicals? which meetings do you go to? And all that detail is part of the Survey Results publication. And we do ask them which extension agents they find helpful, so for each state there are a handful of extension agents specified by name whom the organic growers find helpful.

So, in conclusion, here is a brief list of suggestions that OFRF has made to USDA for **opportunities to pursue in organic farming research and extension** (**Table 17**). There is a new research title authorization specifically for organic farming research and extension. The new Initiative for Future Food and Agriculture Systems we think is a great opportunity for the Department and the Land Grants to develop what many Americans would like to see as the future of their agricultural system. We have tried to point out that there are a number of important opportunities that wouldn't need any congressional authorization or appropriation and I'm really happy to say that today's meeting represents for me an indication that it's beginning to happen.

Question: Do we know anything about the nature of the non-respondents to the survey and what that might indicate about the results?
Response: I really can't answer that question for you. Erica Walz, who is manager of the survey and its designer would have to say something about that and there may be some part of the publication that addresses that. But we got a very good representation from, I think, 45 different states. There's not, for example, a region of the country that we're missing. Most of the demographic data matches with estimates by those who have been familiar with the industry for many years. So, I think we have a very good representation overall. It may be that the biggest operators are not participating at the same rate. But that's still a small number of producers.

Question: Will the mandatory certification under the new federal regulations drive growers out of the organic marketplace because they don't want to deal with it?
Response: I think that will probably happen to some degree. It probably will be balanced out by other growers who are entering the market because they've been waiting for that standardization to be there. Really it depends upon what the final shape of the rules looks like. The important thing about the income data that we showed is, that while about 25 percent of the growers are under $5,000 (annual sales) level which exempts them from mandatory certification, there's another 45 percent almost that are under $30,000 or $35,000. These are still very small operators and growers who will be potentially very highly impacted by the costs of mandatory certification and in OFRF's comments to the proposed rule, we pointed this out. We concluded that there really needs to be some kind of intermediate category — some way of allocating the resources and costs of the regulation so that that very big segment that's still between $5,000 in sales and $30,000 or $50,000 isn't adversely impacted. The Survey does have some very useful data for interpreting the proposed regulations and recommending changes to them.

Table 17: OFRF Recommendations to USDA

1. Implementation of the Organic Agricultural Research and Extension Initiative (PL 105-185, Sec. 244):

    - Include $10 million in the FY 2000 budget request for competitive grants under this authorization.

2. Include organic agricultural production and marketing in implementation of the Initiative for Future Agriculture and Food Systems (PL 105-185, Sec. 401).

3. Integrate tracking, analysis, needs assessment and support of the organic sector into all USDA agricultural research and extension agencies/programs.

    - Establish July 1999 goal for report by all REE agencies on organic sector in the context of their mission, including proposals for FY 2001 budget request.

    - Mobilize immediate data collection effort to support the AMS-National Organic Program to definitively characterize the size, scope and makeup of the organic sector.

    - Establish coordinating function within Under Secretary's office to oversee REE agency efforts regarding organic agriculture.

    - Catalogue and evaluate all research and extension efforts dedicated to organic agriculture; incorporate organic research category into CRIS system.

1998 Organic Research Initiative Legislation

Speaker # 2: Mark Keating
Henry A. Wallace Institute for Alternative Agriculture

Good afternoon everyone. I want to thank Cathy, Jill and Mark for inviting me to come down and speak a little bit today. I was asked to talk about the legislative dynamics behind the passage of the Organic Research Initiative. I see Robert Blobaum is here and I know that he knows a lot more about this topic than I do so I'll try to go as fast as I can and if he wants to add anything I think that would be helpful too. [*Roger Blobaum is a member of the OFRF Board of Directors and a member of Organic Watch.*]

I like to think that the relatively tame story of the Organic Research Initiative is an indication that everybody realized that this was an idea whose time had come. I think a lot of the credit for that recommendation goes back to *Searching for the "O-Word"* from the Organic Farming Research Foundation. You just saw an overview of some of the work that they're doing now —

Searching for the "O-Word" is the same caliber of research. I think OFRF really deserves a lot of credit for identifying the nail and then hitting it right on the head.

The report thoroughly states the fact that the federal agriculture research commitment to organic is disproportionate relative to the growth and the role that organic agriculture is playing in the overall economy. One of the people in Washington who picked up very quickly on the implications of that was Congressman Sam Farr who represents a California district — he is in the House of Representatives for the Central Coast of California including Santa Cruz. He has a very strong constituency at home that is knowledgeable and committed to organic agriculture. And he also has considerable experience working at the state level on the 1990 California Organic Foods Act.

Working with OFRF and others in the movement, Congressman Farr's office put together an initiative to provide for federally funded research in organic agriculture. Their intention was to incorporate this into the Research Title of the 1998 Federal Agriculture Research, Education Extension Reform Act, which was ultimately signed by the President this past summer. The nature of the provision is somewhat analogous to the Plant Genome Research Initiative. It's a competitive, open-ended, open solicitation, grant process. Applicants are required to provide non-federal matching funding. However, with the Organic Initiative, those matching fund requirements can be waived for minor crops that might have a hard time finding a commodity group, industry, or some other source of funding. We know that is very important in the organic sector because of the small size of some of these markets.

The legislative process from what I've seen from the outside was a relatively tame one. Congressman Farr took the Initiative to the leadership in the House under Chairman Smith; they were receptive to the idea. In the Senate I think the leaders of the Initiative were Senators Leahy and Harkin and, again, the majority was very comfortable with the provisions in the title. I think this reflects the fact that any representative from an agricultural district recognizes that the organic sector is an important part of the agricultural economy. There is really nobody from any agricultural district or serving an agricultural community that doesn't see some benefit from the application of organic practices.

Both the House and Senate were supportive of the Initiative. It was rolled into the Research Title, the 1998 research bill, but at this point there is no funding. There is no mandatory funding level inside the Initiative. So when we get to the appropriations process, we'll see a little bit more just how significant the commitment of support is that the passage of the legislation indicated.

I know that Deputy Secretary Rominger has been supportive of this Initiative and I think that we can count on this commitment in the future. I think that a gathering like we have today reflects the fact that there's a broad sector of the agricultural community that very much wants to see organic research integrated into the overall objectives of the Department. So I'll leave it at that and again thanks a lot for having me.

Question: Mark, when does the appropriations period begin?
Response: Well, I think the first round will begin when we hear from the department, usually January or February, what their request is. In terms of funding, I don't know, I have no indication right now what they're going to ask for. They'll send a proposed budget, but that's usually just the first step.

Question: Roger, did you want to add something?
(Roger Blobaum responds.)
Mark paraphrases: Did everybody in the back hear that observation? Roger pointed out that in the original 1990 offer of the organic legislation, there was an extensive research initiative for

organic agriculture. It did not survive. I believe during the House-Senate conference it was dropped. Roger's sentiment was that at the time, there was not the support within the academic community for that initiative to go forward, but now, as part of this idea whose time has come, there is ample evidence to justify that. The support is there, and we're very happy with it.

Sustainable Development and Small Farms

Speaker #3: Adela Backiel
USDA – Office of Chief Economist

I'm Adela Backiel, as Cathy said. I'm now Director of Sustainable Development, but that is part of the Small Farms Commission Report. I encouraged the Secretary and recommended to the Secretary that he form and establish an office of small farms to advocate, to promote, to coordinate, to cooperate with all small farms issues within the department, internally, but also externally with the partners as well. He has done that. At the Small Farms Commission meeting, a few weeks ago, he did announce establishment of an **Office of Sustainable Development and Small Farms**. We are now in the process of getting that office up and running. As many of you know from working in organics, the bureaucracy of doing, of establishing an office, of getting it up and ready, takes a little bit of time, but we're doing it as quickly as possible.

I would like to encourage you to get in touch with me, with your ideas, your thoughts, your partnerships, on what USDA can do both internally and externally to promote these issues and to help increase USDA's portfolios for small farms. My phone number is **202-720-2456**. I have no idea if it is going to be changing or not, but you'll be able to keep up with what is happening with this through the web site that we put together for the commission, which is **www.usda.80/oce/osfsd.** Use my phone number for the time being and as that develops we'll make sure that the organic community as, of course, a large proportion of the small farms' interests, make sure that you know what's going on with it.

Organic Research in the SARE Program

Speaker # 4: Jill Auburn
USDA - Sustainable Agriculture Research and Education (SARE)

The SARE program, Sustainable Agricultural Research and Education, is within Cooperative State Research, Education and Extension Service (CSREES) within USDA. We've been around for about ten years, funding research, education, and demonstrations. We also fund professional development for extension and other agencies of USDA and other agricultural professionals. Also, we give small grants to producers in which they test out their on-the-farm production and marketing ideas and share them with their neighbors. You can read more about SARE in our free publication, *1998 Highlights.*

We view organic as a subset, or an overlapping concept within the broad range of things we do in sustainable agriculture. In Mark Lipson's *Searching for the "O-Word"* report, they estimated that approximately 20 percent of the SARE projects take place on organic farms or are highly relevant to organic farms. We didn't have our database quite into form in the CRIS system for Mark to do

his analysis, so the SARE projects were not formally a part of that analysis. But Kim Kroll, our Associate Director, is developing a database of roughly 1200 projects that we've funded since the beginning of the program. They will be available shortly on the World Wide Web. We don't have a perfect key wording system quite yet for pulling out projects of interest to organic producers and others dealing in organic, but through some combinations of search terms that Kim used, he pulled out a listing of more than 200 projects that are most related to organic..

For example, a number of projects we funded around the country, particularly in the early years of the SARE program, were large-scale comparisons of organic, low-input and conventional farming systems. Quite a few of the producer grants deal with non-chemical approaches to production, biological controls, and that kind of thing. And I'm happy to say in the Professional Development Program (PDP), the "train-the-trainers" program, there have been projects in at least three of the four regions that have been exclusively aimed at educating extension agents and other professionals about organic agriculture. The whole PDP program is educating professionals about sustainable agriculture generally. Our World Wide Web address is www.sare.org, where you can check out our project database and other information available from our program.

Organic Research in Michigan

Speaker #5: Susan Houghton

Michigan Organic Food and Farm Alliance (MOFFA) and Organic Growers of Michigan

I wanted to talk a little bit about the research that is going on in Michigan to give you an idea about that, and emphasize that this came from the growers themselves. Part of it is funded by SARE. Part of it is funded under other sustainable programs through the universities. We have an on-farm research network that was put together by the Michigan Organic Food and Farm Alliance in collaboration with Michigan State University and the Michigan Ag Experiment Station. They initiated an organic on-farm research program in 1997. The collaborative program is providing funds and technical support to growers and others who submitted successful proposals.

Our goal is to assist farmers and others in the organic community to investigate questions of their choice and communicate the results to others. Several grants are supporting replicate field studies, while others are directed towards education of farmers and consumers. The following six priority areas for grant awards were chosen by the farmer-driven steering committee: 1) Crop and livestock production, 2) Marketing issues for large farms, 3) Marketing issues for small farms, 4) Interactions between farmers and the local community, 5) Demonstration for successful organic food and farming systems, and 6) consumer linkages to marketing and production.

MOFFA, through the program coordinator, provides technical support to grant recipients including assistance in designing experiments and interpreting and reporting results. Grantees receive between $300 and $1,000 to conduct a project. Results and findings will be made available through publications, periodicals and at winter meetings.

In our first year of projects, farmers have investigated amendments for pasture renovation, varieties of hard spring wheat, agronomy of field peas in Michigan, rotation of pasture and horticulture crops, weed and erosion control with various mulches, and field and greenhouse tomatoes. Education projects involve middle school students writing a book on eating and producing organically, providing children of farmers with a look at organic production, a field day designed to help transition farmers to organic, and garden tours as a marketing tool.

If you want more information about those programs, you can contact Dr. John Fisk, at Michigan State University (Email: fiskjohn@pilot.msu.edu.)

Then we have another focus that's called on-station research — a long-term rotation study was initiated in 1991 by the Kellogg Biological Station in western Michigan under the direction of Dr. Richard Harwood, C.S. Mott Chair of Sustainable Agriculture at Michigan State University. This study includes four management types: organic, integrated with compost, integrated with fertilizer, and conventional. "Integrated" means cover crops are fit in a rotation to use abandoned field sites. And then "management types" are field crop rotations of wheat/corn, corn/soybean, or continuous corn treatment. Many aspects of soil impact on plants have been investigated in this study. However, the main focus has been on the integrated treatments and *not* the organic treatments. Beginning in 1997, more in-depth data has been taken in the organic treatments. Soil modification potential and levels of soluble nutrients are being investigated as indicators of fertility management. Again, you can contact Dr. Harwood or Dr. Fisk at MSU.

The third research area is enhancing adoption of sustainable agricultural practices via farmer driven research. This has led to a SAREP-funded project at the MSU Kellogg Biological Station. Our objective for this project is to establish farmer-driven research design teams to guide research and cover costs in cropping systems at Michigan State University and Kellogg Biological Station (KBS).

Our goals have been to develop a research agenda that directly addresses farmers' needs, encourages collaboration among farmers and researchers, fosters networks among farmers and provides a forum where farmers can learn directly from other farmers. The design team includes farmers and university staff including researchers, extensionists and farm managers. We have two design teams: one for low-input systems and one for organic systems. In these meetings, we have designed a crop rotation experiment that includes a transition to organic. KBS has a cover crops program in a rotation study under way, comparing their rotation with conventional levels of chemical inputs to a low input system that included cover crops and reduced herbicide levels. With guidance from the design teams, we have begun transition of the conventional system to low input, and the low-input system to organic. The design teams designed the farm management protocols.

In addition to the rotation study, we have two 2-acre plots that are in transition to organic. We have used the organic design teams as our consultant to advise in our transition. We have invited an Organic Crop Improvement Association inspector from southwest Michigan to the last meeting. It remains to be seen whether we can actually certify our research plots as organic. Constraints imposed by our situation in the research facility with neighboring conventional research plots may prevent our certification. Nevertheless, we will comply with OCIA in standards to the extent we are able, and we will apply to be members of OCIA. To date, we have benefited more than our organic design members have from our meetings. That helps us tremendously in our transition to organic and in the future we ought to conduct research which addresses questions raised by the organic cooperatives. And for this, you ought to contact Larry Diewin and Dale Mutch at the Kellogg Biological Station (phone: 616-353-4569.)

There are two farmer-led organizations in Michigan: Organic Growers of Michigan and Michigan Organic Food and Farm Alliance. They have led the way in Michigan for several years. The first provides a forum for growers to learn together and offer certification, while the latter is a non-profit focusing on public education and institutional change. OCIA also offers certification in Michigan, but they don't do the education that Organic Growers of Michigan does. Recently, the Michigan Department of Agriculture announced the formation of an organic advisory board. The board includes members of Organic Growers of Michigan, Michigan Organic Food and Farm Alliance, and NRCS, university extension and others. At this point, the board will convene for a

nine-month period to advise the MDA on how it can assist the organic industry. That's about where Michigan is.

Question: Susan, what are the scientists that are on the design team and what disciplines do they represent?
Response: Cover-crop studies mostly. We don't have anybody in livestock. We have crop and soil sciences and that's about it.

What are the major crops being grown and studied in Michigan?
In Michigan. Soybeans. (laughter)
Only soybeans?
Response: Most of the other growers are small vegetable growers and I would say we probably fall into Mark's delineation of that. Money-wise and crop-wise.
Question: A lot of edible beans too? Right?
Response: Yes. But soybeans. Major soybeans.

Research Needs from the Organic Farm Inspector's Perspective

Speaker #6: Jim Riddle
Independent Organic Inspectors Association

My name is James A. (Jim) Riddle and I'm the founding president and still coordinator of the Independent Organic Inspectors Association (IOIA). I would like to begin by telling you a little bit about our association and the work we are doing. IOIA has been in existence since 1991. We train inspectors all over the United States, both private inspectors that work for private certifying agencies and state inspectors. We have a course coming up in a couple of weeks in Iowa. This is a seven-day inspector-training course. We also run courses in numerous locations in Canada and all over the world, including Japan, Australia, Mexico, Guatemala, Costa Rica, Russia, and even California.

We also have written the IOIA Organic Inspection Manual with help from a USDA Federal-State Market Improvement Program (FSMIP) grant. The Manual serves as a comprehensive guide for the inspection of organic crops, livestock, and processing facilities. Anyone involved in organic research should read the manual to understand what the inspectors are looking for. This can provide valuable guidance for the construction of research projects. The Manual doesn't tell you how to farm organically, but it does tell you what the inspector is going to be looking for. The Manual, in partnership with organic standards, are really critical documents for the research sector to be working from.

I've inspected some research farms and one of them was organic by neglect. There were no inputs, no soil building program, no cover cropping, no rotation; it was not certifiable. And that's the way they intended to operate it, but they did want it certified. It was kind of a disappointment. At any rate, you need to know what your goals are, but it certainly is important to be realistic in the integrated research that you conduct, by factoring in organic certification requirements and organic prices, so that the research is truly beneficial to organic producers.

IOIA is also conducting a project to standardize certification and inspection forms, so that questionnaires, applications, inspection reports, and organic certificates follow standardized formats, which are user friendly and electronically transferable.

I've been an organic inspector for twelve years and have been on probably thousands of organic farms and facilities. I have some observations that I would like to share as far as some of the research needs that IOIA has identified. I'm very excited to be over here thinking about research because this is really what I love - having my hands in the soil.

The first thing, I would like to take this opportunity to endorse the services of ATTRA, the Appropriate Technology and Transfer for Rural Areas of the USDA. They have an 800 number and provide answers to organic research questions. I refer farmers to ATTRA all the time. Who you going to call? ATTRA. They have researchers on staff that will help explore and do a research search to help find information. So I just want to make you aware of that in case ATTRA has not already been mentioned today.

Under organic standards, there is still kind of a "loophole" as it were, as far as the use of fungicide-treated seeds. It's an availability issue. Organic producers are not supposed to use treated seeds. They are supposed to use organically grown seeds, number 1. Well, that's the least available. Untreated seeds, number 2, and treated seeds if you can't get the variety you need untreated. Under no circumstances may you use genetically engineered seeds. So, a very real research need is biological and botanical seed treatments that provide the fungicidal qualities of the synthetics like Captan, Thiram and similar compounds, so that organic producers can plant when soil conditions are less than ideal.

Another research need related directed to the above is the availability of organic seeds, grown using certified organic seed crop management and production techniques. The use of organic seed may be allowed (and is even preferred) but not many seed producers are producing seeds organically, and farmers do not know what organic seeds are available. Who's cataloging organic seeds? How are organic seeds identified and tracked?

There is also a lot of research needed to identify and track genetically engineered seeds and planting stock. Public information needs to be made readily available because such products aren't required to be labeled.

Another research need related to the above concerns the impacts of **genetic engineering** on organic producers and the environment. The resistance of target pests, such the Colorado potato beetle, building up resistance to Bt due to use of the Bt engineered potato. Bt has historically been an approved input for topical application in organic production, but Colorado potato beetles are becoming resistant to Bt in just a few generations because of the genetically engineered potatoes.

Also, genetically engineered organisms have effects on non-target organisms. For example, there are now many thousands of acres of genetically engineered corn crops out in the Midwest which contain the Bt toxin to prevent damage from European corn borers; well, it's not just the corn borer that is eating that corn. There are all kinds of other insects in those cornfields.

There is a living ecosystem that are out there ingesting those Bt toxins. So any lepidoptera clearly is being affected by these genetically altered crops. Research in Europe has also shown that these crops are negatively affecting beneficial insects such as lacewings and ladybugs.

A big concern for organic producers and inspectors is the incidence and effects of genetic drift. The effects of genetically engineered crops don't stop at the fence line. There are weed species, especially in the cruciferae family, because of use of Roundup Ready (herbicide resistant) canola, that readily cross-pollinate with wild cruciferae species. And it is not just the weeds that are picking up the herbicide resistance and genetically engineered characteristics. There are neighboring organic crops which are being pollinated with GEO pollen, and then showing up as genetically engineered when tested.

You can see that this is a huge problem for organic producers and inspectors, and we need research support in order to make informed decisions.

Another problem that I encounter quite often is mislabeled "natural and organic" fertilizers. Products labeled "natural and organic," containing inputs which are clearly prohibited for use in organic agriculture, are often innocently used by well-meaning organic farmers and gardeners. There is a huge information gap here. There needs to be research on these types of fertilizer label claims; their frequency, the claims made, the ingredients they contain and how they are being used.

In **organic livestock**, some of the things we've come across which need research include:

Flies: We really need research on effective, least toxic fly control strategies - not just inputs but strategies which address management of the habitat and harborage. A lot of research in this area was done in the past, but there is not a lot of new information. And what information on non-toxic fly prevention and control strategies that does exist needs to get out to organic farmers. Also, the use of beneficials, including the release of fly parasites in manure piles, for instance, needs further research and development. The use of botanicals, minerals and mechanical controls for flies also needs to be examined. If they built a better flytrap, then I'll bring my animals through it. And there are, in fact, big flytraps that cows walk through and it brushes them off and they get caught, so the cows come into the barn clean. How many people are using them? Not many, I have to report.

Manure management: The relationship between manure management and management of the immediate environment of the livestock needs to be examined closely, for both fly control and parasite control.

Parasites: There is a special need for research in target regions which don't have freezing cycles where livestock can have heavy burdens of parasites. Parasites can build up in the soils of high humidity regions and areas that don't get terribly dry and kill parasites. There is a need to research least toxic parasite control and prevention strategies.

Feed additives and labeling: Products such as the example shown, "ADM Layer-Base Organic," are being sold to organic producers. There is not one organic ingredient in this product. There are numerous prohibited materials, including etoxiquin, EDTA, preservatives, and antioxidants. The product contains 20 percent protein derived from fish meal. According to organic standards, 100 percent of the feed, including the protein, needs to come from certified organic sources. So the example discussed above is mislabeling which is misleading to the organic farmer who is having the feed base added to organic grains as a supplement, because the product is labeled "organic." The farmer must always read the fine print and know the standards; it is buyer beware; it is always the producer's mistake for accepting at face value the word "organic" on this kind of a product.

I call this to your attention so that you have some awareness of what is happening. There is a need for better regulation of fertilizer and feed supplement label claims, for research to establish exactly the types of products now being used and for research into feed supplements, minerals and vitamins which are truly compatible with the principles of organic production. Organic farmers can provide excellent rations of 100 percent organic feeds, but they still need supplements, and the organic industry needs to know what are the best supplements for organic livestock production.

On the food processing side, organic inspectors look at what we call organic control points (OCP's), which are places where the integrity of organic product can be violated during processing. OCP's need to be identified for specific industries. This would be an excellent research project.

Also, there are concerns about boiler chemical residues that get into processed foods. It's really hard to find out information on whether or not boiler chemical residues show up in the food. People aren't doing those studies yet. And how to avoid using boiler chemicals in the first place.

Heat treatment as an effective non-toxic pest control strategy for food-processing facilities is another area where more research is needed.

Genetic engineering, once again, and the tracking of GEO products and ingredients, is a huge issue for organic processing, just like at the farm level.

Organic inspectors need more research and empowerment concerning the electronic transfer of the data that we collect. We also need research to assist in making the drift determinations and having the proper sampling tools.

So there's kind of a wish list for you, based on the experiences and observations of organic inspectors. I appreciate the opportunity to speak, and appreciate the research that you are doing and plan to do in the future.

The Alternative Farming Systems Information Center

Speaker #7: Mary Gold
National Agricultural Library - NAL-AFSIC

I'm with the Alternative Farming Systems Information Center at the National Agricultural Library. We're one of nine information centers that focus on a particular topic of current interest. And we've been there since 1985. We're funded in part by SARE program, as well as by the Library. We were originally, in 1985, mandated to collect information and disperse information about alternative agricultural methods. Our subject areas include all kinds of alternatives including organic farming and we've done many publications, bibliographic and reference types on organic farming, marketing, and other research topics.

Our services include database searching on request, on specialized topics. And we have lots of databases that we have access to search, including AGRICOLA, which is the database created at the National Agricultural Library. While I'm talking about databases, I want to emphasize that research which can't be accessed or found by people is not useful. Besides offering services to patrons, we really encourage people to let us know about publications, research, all kinds of things to include in the collection and in the databases where people can find that information. There's a lot of information in this area. And we have quite a bit on organic production systems.

We also provide referrals to other organizations, including ATTRA, for people that are interested. We have a huge file of organizations, agencies, individuals that have offered to help people with specific questions on all kinds of alternatives.

We also create publications. Most of them are bibliographic and reflect materials that are in the National Agricultural Library. We do have one on organic production, which includes lots of resources. We're working on updating it right now. There's a list of all the publications that are available from us over on the table. We provide them free on request and mail them anywhere, so let us know if we can send you anything. Our publications are available full-text on the Internet, at our website http://www.nal.usda.gov/afsic/. In addition, we have a selection of links to other organizations that are involved in organic and other aspects of alternative agriculture.

Question: Mary where do we send them, if we have materials we want to submit for inclusion in the library's database?
Response: Send it to our office and we will do our best to get it into the collection and into the database. My contact information is on the sheet over here [see page 64]; there are a few brochures about the information center.

Comment by Mark Lipson: Mary, I just wanted to say how much I appreciate that AGRICOLA is now available on the NAL website. When I was doing *Searching for the "O-Word,"* I couldn't get AGRICOLA over the Internet. You had to have a thousand-dollar subscription or the CD-ROM and to have it available now as a public database, I think is just tremendous.
Response: We're working on it. We also have, for some time, been getting the SARE (Sustainable Agriculture Research and Education) project reports into the collection and the database, too. We have added about 300 so far. We're the only ones who have these for lending to the public.

ARS National Programs and Organic Agriculture

Speaker #8: Mike Jawson
USDA-Agricultural Research Services

I appreciate the opportunity to address you all this afternoon. I will address what we're going to be doing to better meet the needs of organic farmers and then talk a little bit about ARS's activities in terms of its organization.

First of all, ARS is interested in better addressing the needs of organic farmers. We would like to believe that we do have many activities that relate to the interest of organic producers. We accept the criticism that perhaps we've been remiss in maybe not putting ARS research together in systems that are more wholly utilizable for organic producers. Mickey McGuire, an ARS scientist, for instance, will talk about some of the bio-control activities that we're undertaking in the next few minutes. I think there are ARS activities that certainly are useful to organic producers. It's a systems context in particular that we can improve on quite a bit.

ARS is also interested in doing this in a manner where we get input from the organic producers. This is very important to us. Not only from organic producers, but all producers as we develop our programs. In this regard, Mark Lipson has graciously agreed to stay over the weekend and he and a number of producers will be meeting with ARS and Jill Auburn of the SARE program and a few others this Monday to plan a workshop and other activities in order to better obtain this input. That's one specific thing that will be occurring in the near future.

In regards to where ARS is now, ARS has organized its research in what it's calling national programs. I think we started off with 25 of them. We're down to 23. These are available for your review and comment on the web. If you don't have access to the web, certainly you could contact anyone with ARS and we'd be glad to share with you a paper copy. But the web address is just www.ars.usda.gov. You can click on national programs; there's a short version and a long version and we are continuously soliciting comments from the public. These are dynamic documents. We are trying to be more transparent. We're trying to be more accessible for input and comments, so please do that. In fact, as part of this web system, there actually is a reply and comment page for you to send us your comments on it and we do take them seriously.

I will have to admit that we do not have an organic farming national program. The national programs are topic-based in terms of crop production, integrated farming systems, soil management and water quality. They are not commodity directed anymore. We are trying to make them as generic and meet as broad an audience as possible, so they're not directed towards a particular commodity or towards a particular organization.
With that, I would be willing to attempt to answer any questions that you may have. Yes?

Question: Are you collecting economic data on organic systems?

Response: No, that's ERS, the Economic Research Service. It's on their agenda. ARS is the Agricultural Research Service, and essentially we do production research. We are the in-house research arm of USDA versus the land-grant universities who are viewed as the extramural research organizations in USDA.

Question: (not audible)
Response: The question was in regards to are we interested in evaluating the ecosystem services aspects of agricultural activities and something also about including statistics with that? I don't know if we would get down to statistics in the same way that organizations that do monitoring do, but we certainly are interested in addressing what ecological services are provided or could be provided by various agricultural production systems. Our focus will be on agricultural production area, but we certainly aren't ignoring ecological services.
We have research programs, for instance, that are addressing riparian buffers. We are studying what is the composition of the species in the riparian buffers - everything from wildlife to the plants that are there. What services do they provide besides potentially just serving as the spot for filtering water? We have interest in border effects to some extent in various cropping fields. What kind of species can be harbored in borders of fields? So there is some addressing of those issues.

Comment: (not audible)
Response: The comment here was also is there is a home for that kind of research in the Economic Research Service. Yes, I believe so.

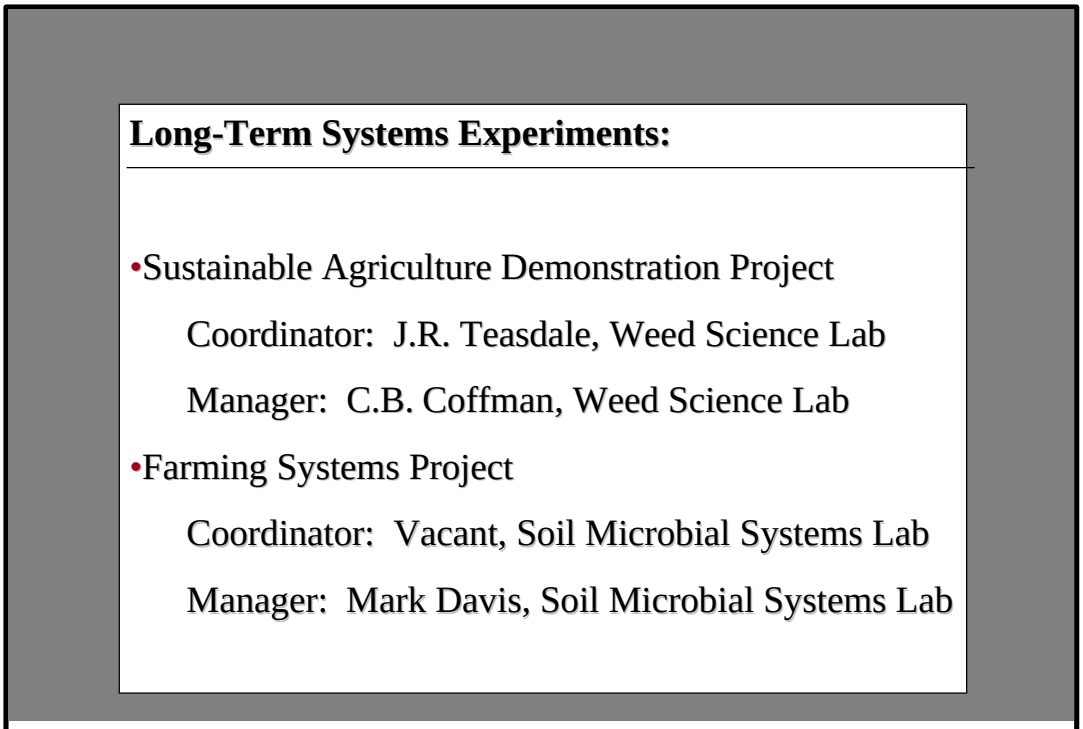
Organic Research at the Beltsville Research Center

Speaker #9: John Teasdale
USDA - Agricultural Research Service

I am going to summarize some of the research that we're doing at the Beltsville Research Center. We're one of eight areas within the Agricultural Research Service nationwide.

First of all, there's quite a sizable sustainable agricultural research program going on at Beltsville that entails about 44 FTE (full-time equivalent,) that's basically 44 scientists, and $3.8 million. Organic agriculture research would represent a subset of that. The research involves both long-term systems experiments and also component or disciplinary research that supports organic agriculture. The research emphasis is on understanding fundamental processes and this is the thing that probably ARS does best and I think where we can make our best contribution. Finally, there is an outreach mechanism where we're involved in getting feedback from the community as well as providing information to farmers in the area; Mark Davis will say a little more about this in his talk.

Let me review two long-term systems experiments (**Slide 1**) that we have going on in Beltsville. One is called the Sustainable Agriculture Demonstration Project and I'm the research coordinator of that. I'm in the weed science lab; weed science is my main area of study. The field manager of this project is Ben Coffman. We also have a Farming Systems Project that was just started a couple of years ago by Laura Lengnick. Mark Davis is the farm manager of that project.



Slide 1

There is so much component research being conducted at Beltsville but there's not really time to go into much detail. There's quite a bit of **cover crop management work** that pertains to organic agriculture and I'll say a little bit more specifically about that in a minute. This work involves both field crops and fruit and vegetable crops. There is a **cover crop breeding program** that we're just getting going. I think this is a fairly exciting area because most of the cover crops that are being used now were really developed for forage or for grains or for some other use than a cover crop. I think it's time that we really focused on trying to develop cover crops to do the kind of things we want our cover crops to do. There's a new **composting** site that we've established and there's a whole research project involved with composting.

There's quite a bit of **soil quality** work that's being done to understand how cover crops or soil amendments are improving our soil and how some of our sustainable strategies are improving our soils in the long-term. Mark Lipson had **weed management** and weed control listed as major problems in organic agriculture. We're understanding better weed seed bank dynamics and how to manage that and keep it at the lower levels. There's quite an extensive **bio-control** program in place at Beltsville.

Let me just talk briefly about the field crops demonstration project. This is a long-term project that's been underway now for 5 years and the main feature of this is that it's on sloping land that's erodible and so the treatments have to be able to prevent erosion.

Environmental Tradeoffs

30-Year EPIC Simulation

System	Erosion (MT/ha)	N Loss (kg/ha)	Pesticide Hazard
No-Tillage	2.0	10.1	29.95
Cover Crop	1.5	18.2	0.04
Manure	5.0	13.3	0

Kelly, Lu, Teasdale (1996) Agric. Ecosyst. Environ. 60:17-28

Slide 2

This slide (**Slide 2**) shows a simulation that presents one of the problems that we're trying to work on relative to organic agriculture. If you look at the first column showing erosion, you'll see that the organic treatment where we relied more on tillage to incorporate amendments and rely on cultivation for weed control; that this organic treatment does expose the soil more to erosion compared to some of the no-tillage, non-organic treatments. We're trying to develop systems where we can minimize tillage in organic systems and I think there's a real challenge there that needs to be met. We can really improve our soils in minimum tillage systems but the general wisdom is that the less tillage you use, the more herbicides and fertilizers you need. So there's a real challenge to try to develop some reduced-tillage, organic systems.

Weed Seedbank Changes

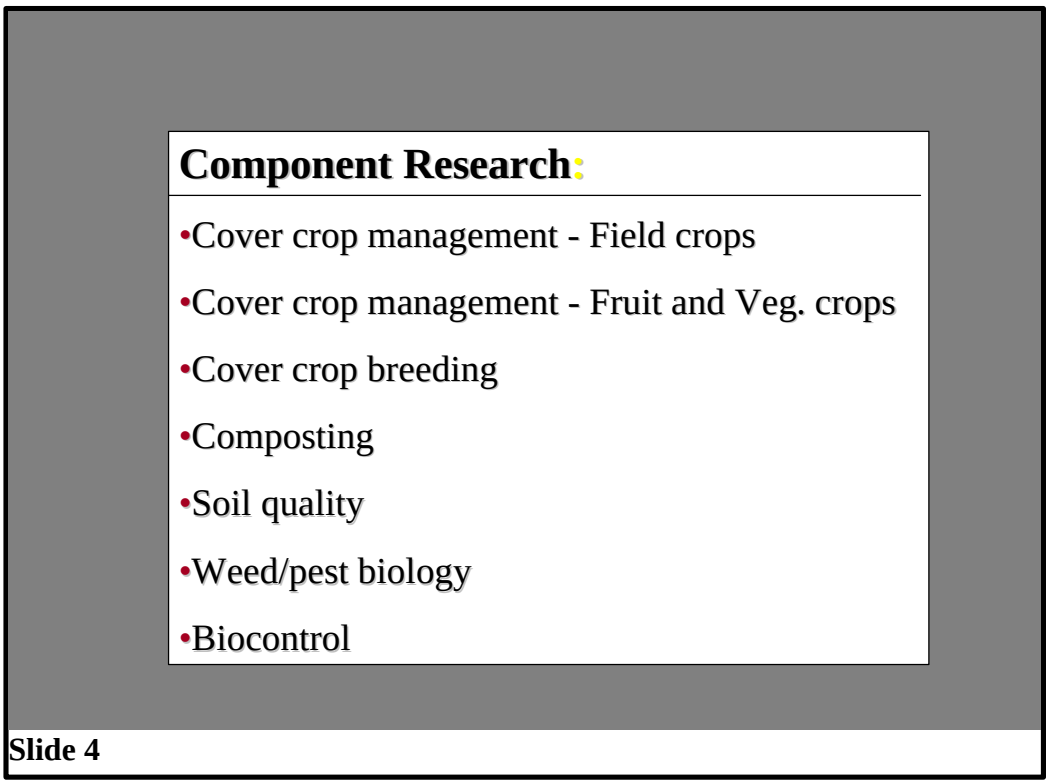
Annual changes in seed per square meter

System	Pigweed	Lambsq.	Foxtail
No-Tillage	…….no change……		
Crownvetch	…….no change……		
Cover Crop	…….no change……		
Manure	+35,000	+12,000	+16,000

Another problem for organic systems is the weeds. This slide shows weed seedbank changes over the years of the study so far (**Slide 3**). The gist of it is that the one treatment where the weed seedbank is increasing is the organic system. The more we go to a minimum tillage, the more all those weed seeds that are shed stay on the surface where they can emerge the next year and the populations can build up. We can't bury them with a moldboard plow on erodible land. And so controlling weeds is particularly challenging in reduced-tillage systems. I'll close with a few ideas of how we're approaching that.

One is cover crop combinations. We want to use a cover crop mulch to suppress weeds in these no-till systems. We found that if we go to combinations of cover crops (such as rye, vetch and crimson clover mix) we can greatly increase the biomass of residue which helps to suppress weeds longer.

Another area is organic ways to kill the cover crops. Of course, in traditional no-till production, the cover crops are killed with herbicides. This slide (not shown) shows a Buffalo corn chopper and this has worked fairly well at killing mature vetch in our research. We often find that we are required to do some cultivating in these no-till systems without herbicides. We're experimenting with different high-residue cultivators, so that after we cultivate we leave the mulch intact along the rows (which is often where the main problems come with cultivating). We usually get a lot of weeds within the crop row that we can't control; this is one component of this system that needs more research. In general, I think that the weed management that we're working on will not depend on any one tactic. We're going to have to put a number of tactics together to develop an integrated system that could be used on organic farms.



Slide 4

I wanted to make one final note here about some of our component research (**Slide 4**). This is a project (funded by the USDA National Research Initiative Competitive Grants Program), looking at how mulches interact with weed seed emergence. These are very small micro-plots and

we're doing very detailed studies on relating weed emergence with environmental variables. From this research, we'll get a much better idea how mulches can be used to suppress weed emergence.

The message that I want to close with here is simply that our research approach is multifaceted. We have both the systems research, on the one hand, where we look at how whole cropping systems perform and then, on the other hand, we're doing some fairly basic research to try to understand how to better develop management strategies for incorporation.

ARS - Long-term Farming Systems Project

Speaker # 10: Mark Davis
USDA - Agricultural Research Service

I'm going to talk quickly about the Farming Systems project at the ARS Beltsville facility. I'll go through some rotations and talk about organic certification then get to the outreach component. The Farming Systems project is a long-term project. It's three years old. Hopefully, it'll go for a long time. It's field research. We have plots that are basically individual crop plots of 30 feet wide by 360 feet long. We use field-size equipment. Our borders are six feet between plot systems. And we use a systems approach. We change as we go because each system is unique. This can play real havoc with the data that we collect and the availability of the data that we're going to try to collect. We're trying to make the systems work. We are also analyzing the economic profitability for each system, as well as the environmental impacts, off-farm social aspects of keeping farmers on the farm and the implications of going to smaller units.

We are working with organic grains so we built organic grain systems and another key is to minimize the transitional period that farmers go through when they go from what I call synthetic systems to organic systems. I kind of shy away from the word "conventional." I like the word "synthetic." The Farming Systems Project has seven cropping systems. We have four synthetic systems (1-4) and three organic systems (5-7). **System 1** is the predominant three-crops-in-two-years cash grain rotation in the Mid-Atlantic, which is corn, followed by wheat, and the next year you harvest the wheat in July with double-crop soybeans planted after wheat harvest. System 1 is no-till, with full synthetic herbicides, pesticides and fertilizer. The other three synthetic systems (2-4) are variations of system 1. In **system 2** we still use synthetic fertilizer. We go to cultivation, mechanical weed control, and herbicides as needed. **System 3** is the same as system 2 but we use poultry manure for our nutrient source. And **system 4** is a the same as 2 and 3 but we replace the poultry manure with composted poultry manure.

Organic systems. **System 5** is a two-year organic corn - soybean rotation. We have some farmers that are going to try this. I don't know if it's feasible or not. The problem is we have a tough time getting a cover crop established in soybeans before next year's corn. We're trying some different approaches to it.

System 6, I know works. I've seen it on farms for years. We have an organic corn – soybean- small grain rotation. We use extensive cover crops. We are using rye, crimson clover or hairy vetch for nitrogen and weed mulching. We use a flail mower and Buffalo stalk chopper to handle the cover crops. Corn and soybeans are no-till planted. The soybeans are cultivated twice with a Buffalo no-till cultivator. Corn receives one to two cultivations. The organic grain is going to smaller pasture-based organic dairies in Southeastern Pennsylvania. They're selling farmer to farmer.

Organic **system 7** has a hay component. Two years of red clover/grass hay. We thought this might be good for the folks in western Maryland and Pennsylvania that have marginal land that is good for pasture and have small cattle operations. The two years of hay provides the nitrogen for next year's corn. This system has worked for years in the region. One of the things we're trying to do is incorporate minimum tillage and more cover crops into the system.

Now let's talk about the outreach. I farmed for quite a few years. I worked with Extension. I've been involved with sustainable agriculture and organic agriculture now for ten, twelve years. We're fairly lucky in the Mid-Atlantic region right here in Maryland and Pennsylvania, and to some extent Virginia. We have a lot of things going on. Sustainable agriculture and organic agriculture is moving forward in the region.

The past four years, eight organizations came together and received a Kellogg funded Integrated Farming Systems (IFS) grant to enhance sustainable agriculture in the Chesapeake Bay Region. The Future Harvest Project (FHP) was begun. It allowed for the formation of a coalition of groups to work together and form lasting partnerships. The FHP provided the foundation and we have now moved to the next level. The next level is the Future Harvest/CASA organization. CASA stands for Chesapeake Alliance for Sustainable Agriculture and Bruce Mertz is here. He's the Executive Director. So we're moving ahead in the area here. It really works out good because it's just a core group of people who have the same vision.

As part of my job with ARS and the Farming Systems Project we're working together with the University of Maryland Cooperative Extension, it's a collaboration of resources. We work together with programs. It works out good for the University of Maryland CES and ARS-Beltsville.

We are going to try to establish a Sustainable Agriculture Resource Center, a library of books, periodicals, journals on sustainable ag, and organic agriculture. It's really a lending library and we really focus on a lot of the old classics, Louis Bromfield, Wendell Berry, Aldo Leopold and others. Many books that farmers, researchers and extension personnel don't have access to.

Working with Maryland CES, we've started an organic study circle group on the Eastern Shore. It's very simple. It's a core group of organic grain farmers. They're either certified, transitional, or want to get into organic grain. We come together and have discussion meetings and farmer field days. They tell us what topics they need information on and we use our resources to bring it to them. It's farmer to farmer, farmers learning from each other and that's really the study circle idea. It's catching on. It's funded by Maryland CES and the Future Harvest CASA.

Another outreach component is a SARE-funded "Professional Development Program" project. John Hall, Kent County CES and myself received a SARE grant for an organic grain production video which we're working on right now. The project will be two videos and support material on organic grain production. The first video will be approximately 15 minutes on what questions should a farm family ask themselves when deciding to do organic grain production. Organic grain production is not for everyone. We want the farm families to make educated decisions. The second video will be a 45-minute video showing "how to" produce organic grains. We're working with Cornell, Penn State, University of Maryland, Rutgers and ARS-Beltsville on this organic video project. Certified organic grain farmers from New York, New Jersey, Pennsylvania and Delaware are key components in this project.

We're currently working with the Maryland Department of Agriculture (MDA) Marketing Services to have the Farming Systems Project systems, 5, 6 and 7 certified organic. We need to be certified so we can utilize organic prices when we do the economic analysis of the Farming Systems Project. This will allow for the true economic picture of organic agriculture when compared to the synthetic cropping systems.

The Economics of Organic Grain Production in the Midwest

Speaker #11: Rick Welsh
Henry A. Wallace Institute for Alternative Agriculture

At the request of the Pew Foundation and in cooperation with the Midwestern Organic Alliance, the Wallace Institute has undertaken a project to review and assess the available literature on the economics (i.e. on-farm profitability) of organic grain and soybean production in the Midwest. This presentation contains the *preliminary* findings of this effort.

The project to this point has entailed reviewing and assessing two sets of literature:

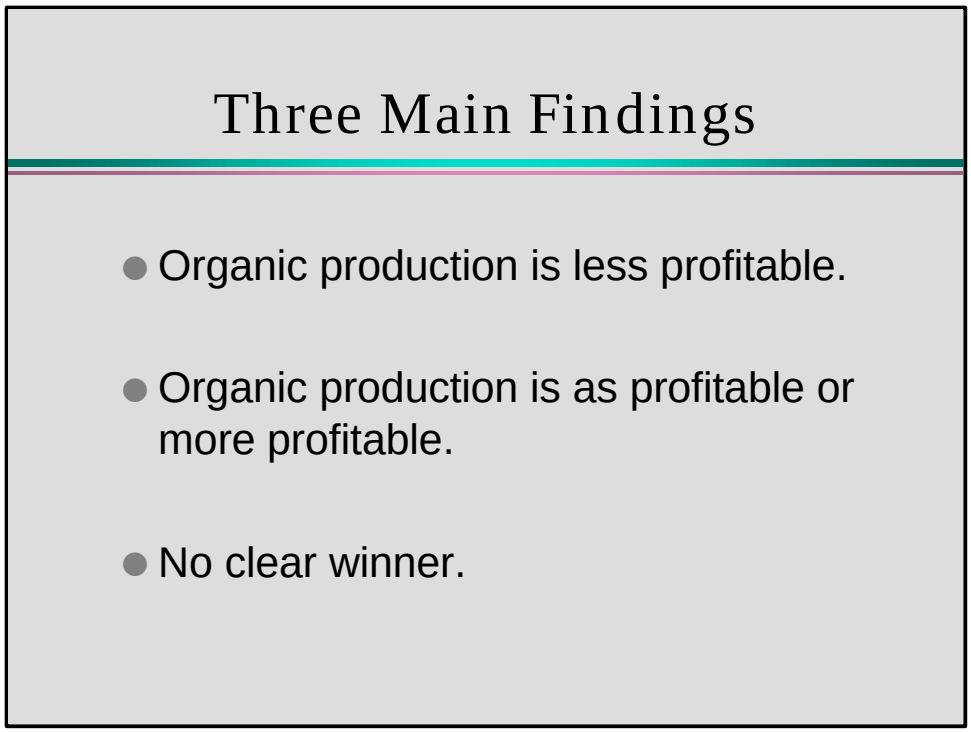
1) The literature reviews on the profitability of organic production compared with conventional production (not limited to grains and soybeans); and,

2) The university studies of organic grain and soybean production in comparison with conventional grain and soybean production.

Regarding the first set of literature, there are three established findings and an emerging finding. The established findings are contradictory and can be summarized as:

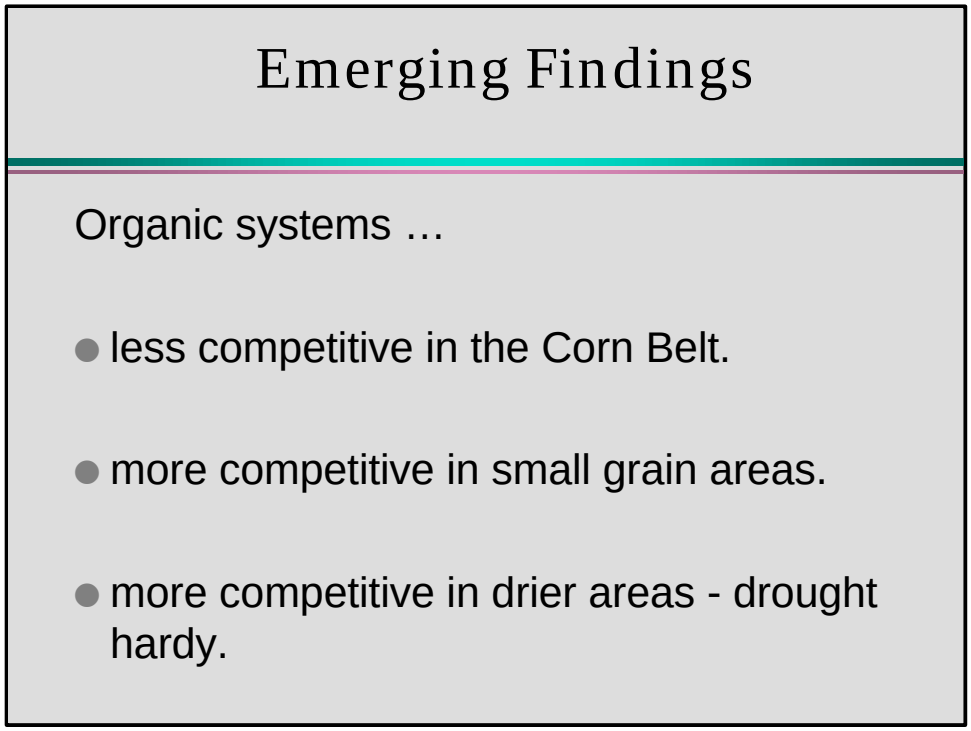
- Organic production is less profitable since the lower costs from not purchasing pesticides and synthetic fertilizers do not compensate for lower yields from weed pressure and less land in high value crops. The requirement of including a green manure crop reduces the land available for higher value crops.

- Organic production is more profitable because the yield penalty, if any, is made up for by a lower overall cost structure. Also, organic price premiums can potentially be earned.

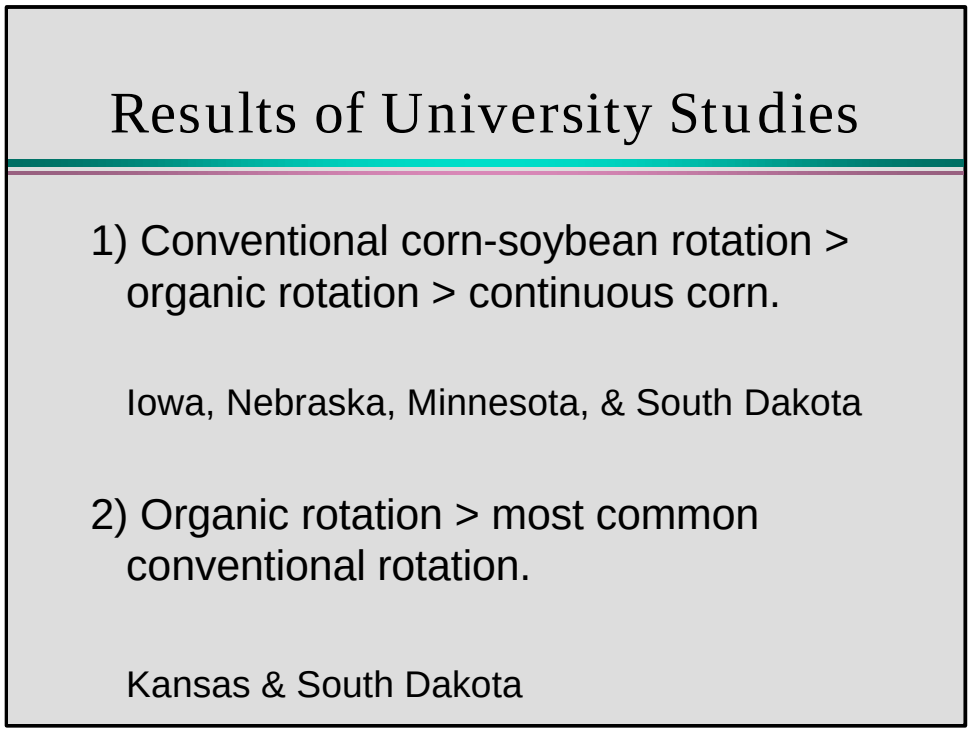


- There is, "no clear winner" because the variations between farms of both groups (organic and conventional) are less important than the variations between farms within each group.

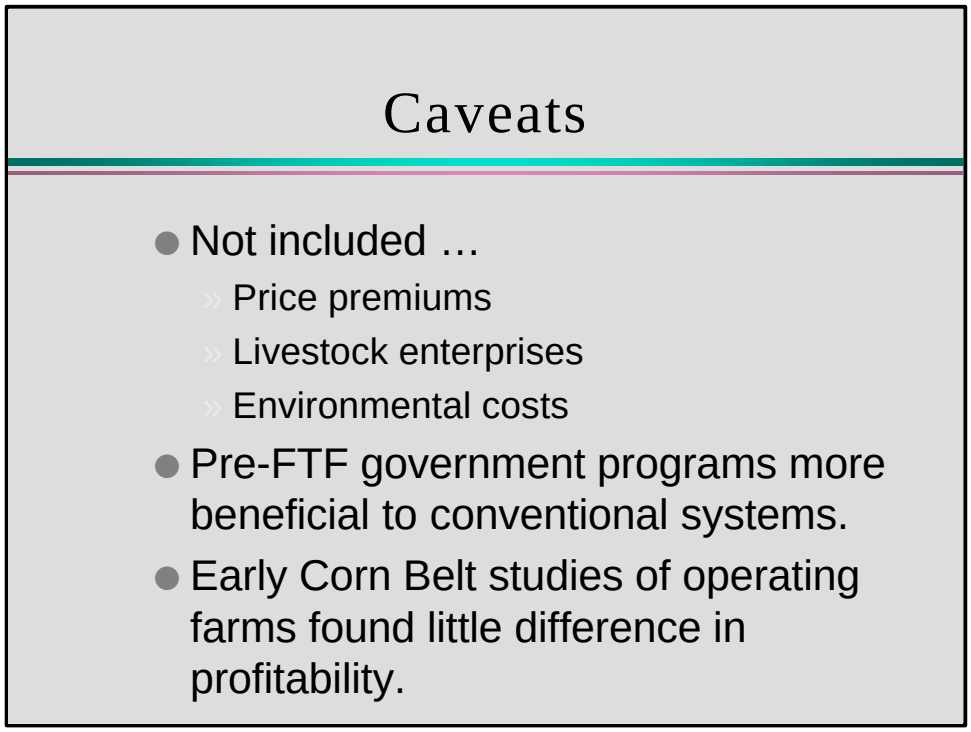
The emerging finding is organic systems are less competitive in the high precipitation Corn Belt and more competitive in the drier small grain areas. Organic agriculture is more drought hardy than conventional agriculture.



The results of the university studies show support for the emerging finding.



Studies at university sites within the traditional corn-soybean and hog areas of the Midwest (Iowa, Nebraska, Minnesota & the South Dakota State site in southeast South Dakota) found that the most profitable conventional rotation (corn-soybean) outperforms the longer organic rotation. However, university studies outside the Corn Belt (Kansas, the South Dakota State site in central South Dakota and Wisconsin) found that the organic rotation out-performs the most common conventional rotations.



ARS Research on Microbial Pesticides

Speaker #12: Michael McGuire
USDA-Agricultural Research Service

In my normal life, I work and live in Peoria, Illinois, where I work on bio-pesticides. I'm currently at Beltsville doing a three-month detail filling in for Ray Carruthers, who has left that position and now gone to our research location in Albany, California.

So what I'd like to do today is just cover a very specific area of some replacement technology, if you will, that is going on. I'm going to first cover very briefly some of the products that are out there right now. These are all commercial products that are available in the U.S. as what we see as replacements to the standard chemical pesticides. There's a lot of talk about, well there's not enough replacements to really get into a non-pesticide type regime, but there is a lot of activity going on and I will talk about some of the replacements that are out there.

We have some microbial insecticides, herbicides, and also there are microbial fungicides out there and there's probably more microbial fungicides than anything else. With the insecticides, with the **bacteria**, Bt, of course, which is the hallmark microbial insecticide — we've heard a lot about Bt already. They're taking the genes and putting them in the plants, which is a concern for the

organic industry, which is one I share by the way. Bt has been around for years. ARS was involved in the very early development of Bt. We're still involved to some extent with looking at some formulations as well as different strains and doing some isolations for new and novel activities. Bt is active against the, of course, Lepidoptera, Coleoptera, Diptera, and they're finding even nematode active strains of Bt. There's just a lot of diversity out there right now. And it's registered on just about anything you want to put it on. The one aspect that I will point out about Bt is we've already seen resistance to fully applied sprays in the field where it's over-utilized. If it's utilized correctly and not sprayed every two or three days, we don't see that resistance developing.

Bacillus popilliae is another bacteria that have been around for years and it's commercially produced and available for Japanese beetle and some other grubs on turf. Again, ARS was involved in that research. *Bacillus sphaericus* is a mosquito pathogen. It's just recently been registered by Abbott Laboratories and is a commercial product.

We looked at the **viruses**. There are three, I go ahead and list them all here, viruses on the market right now. These are listed by trade name. These are the only ones I've listed by trade name because it's easier than saying *nuclear polynucrosis virus* (NPV). These are all NPVs. Again, ARS is involved with all of these as was the Forest Service and the university systems. We've got one that's registered for use on cotton for beet army worm. I don't know if you're familiar with the bollweevil eradication program, but we're starting to see beet army worm be a pest in those areas where they're wiping out natural enemies with these nice broad-spectrum sprays like malathion.

Gypchek has been used on gypsy moth for years and years also. And that is still produced by the Forest Service, I understand. It's not a commercial product per se, but it's used in a lot of municipalities. *Gemstar* is one that just recently received registration. The *Spod-X* and *Gemstar* are registered by Thermo-Trilogy, which is a small company.

The only other thing I'll say about insect viruses is, and I'd be curious to see how the organic farmers see this, but the viruses in the large companies such as American Cyanamid and Dupont are all undergoing genetic manipulation. Part of the problem with viruses is they take about a week to kill the insect and the insect can still cause damage in that period of time. The genetic manipulation is to include a toxin in this virus such that once this virus starts replicating in the insect, it produces this toxin that kills the insect much quicker. And that's a little different take on genetic manipulation. I'd be kind of curious to discuss how people see that.

With the **fungi**, there are two listed, *Beauveria bassiana* has been around for years and years. Also, there's one product on the market. It's marketed against white flies — things like white flies and grasshoppers. It's got a very wide host range. And we have to be a little bit concerned about using that with the impact it might have on some of the natural enemies out there. But for the most part that's a very effective fungus. *Lagenidium giganteum* is one that's used against mosquitoes, and that has just been registered, from my understanding. I had trouble finding information about that. There's one protozoan pathogen, which was actually the first microbial insecticide ever registered for use. That's *Nosema locustae*, which is used on grasshoppers and locusts. It takes about two weeks to kill the grasshopper and this is used mostly by BLM and Forest Service people. Basically, trying to control the grasshopper populations on rangeland before they get into the crops.

Microbial Insecticides

- **Bacteria**
  - *Bacillus thuringiensis*
    - Lepidoptera, Coleoptera, Diptera; numerous crops
  - *Bacillus popilliae*
    - Japanese Beetle; turf
  - *Bacillus sphaericus*
    - mosquitoes

Microbial Insecticides

- **Viruses**
  - Spod-X
    - Beet Armyworm on cotton
  - Gypchek
    - Gypsy Moth on hardwoods
  - GemStar
    - *Heliothis* complex on cotton and other crops

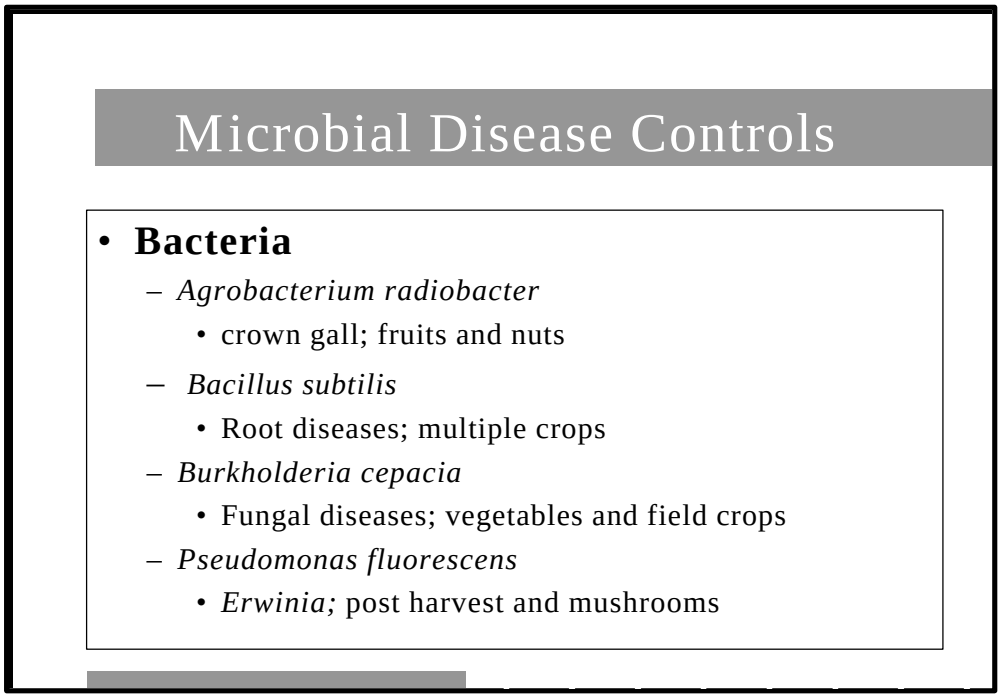
Microbial Insecticides

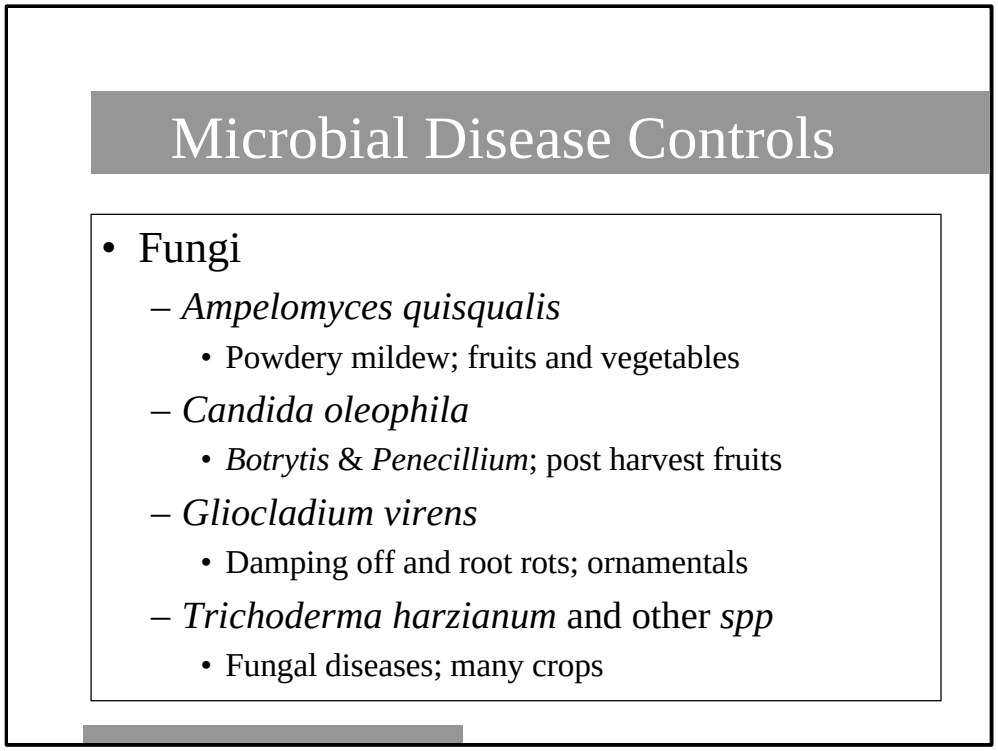
- **Fungi**
  - *Beauveria bassiana*
    - Sucking insects, grasshoppers, some Lepidoptera on field crops, vegetables, etc.
  - *Lagenidium giganteum*
    - mosquitoes
- **Protozoa**
  - *Nosema locustae*
    - Grasshoppers and locusts on range and crop land

Talking about the **herbicides**, we have four that are all fungal based. You can see them listed here. I'm an entomologist. These herbicides are kind of beyond me. There's a lot of development.

Microbial Herbicides

- **Fungi**
  - *Phytophthora palmivora*
    - Strangler vine
  - *Colletotrichum gloeosporioides*
    - northern jointvetch, mallow
  - *Puccinia canaliculata*
    - yellow nutsedge

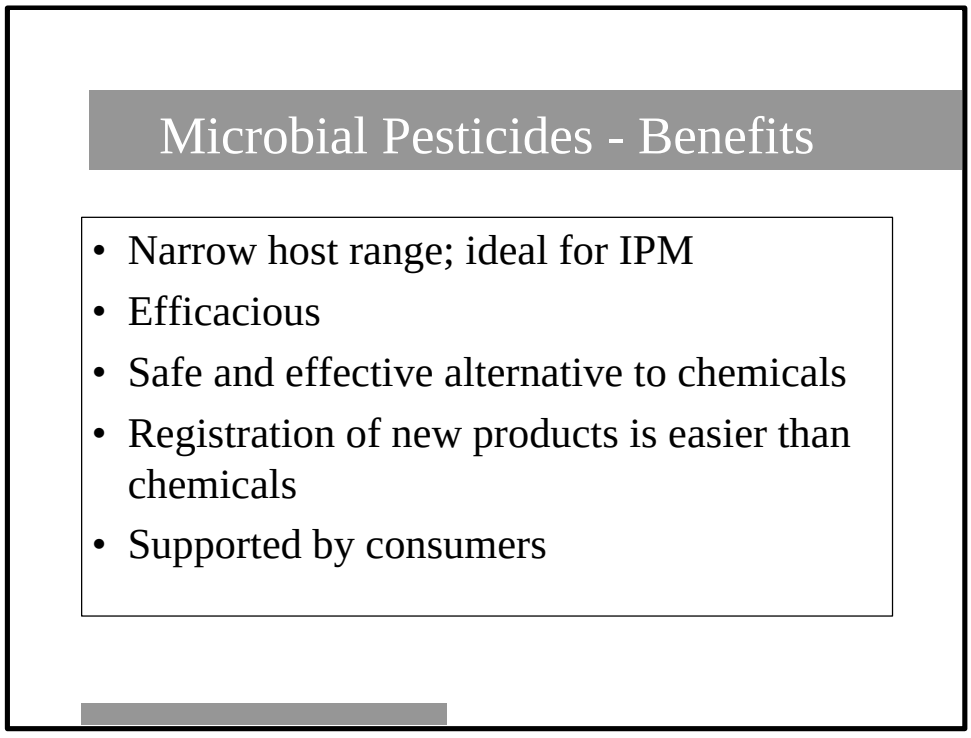




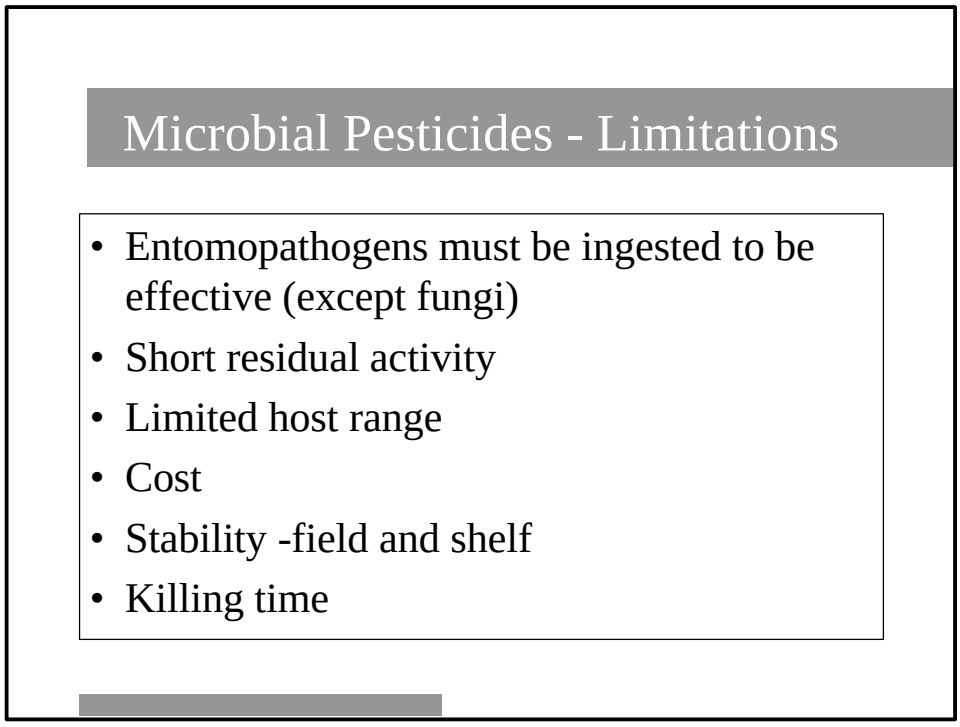
With the **disease controls**, there's a lot more than I expected, and there's a very good website that I'll show you at the end of the presentation. There are bacteria, and these are mostly seed treatments or soil amendment type things and they control a wide range of soil borne fungal pathogens, or bacterial pathogens. And some are used for post harvest as well. *Ampelomyces quisqualis* is a soil bacteria. *Trichoderma harzianum,* I can't even pronounce that silly word, it's been around for awhile. There's a lot of excitement about this one right now because it has a wide host range. It can control a lot of different problems. *Pseudomonas syringae,* there's a lot of pseudomona

strains around, you've probably heard about this one for other purposes as well. There are some more bacteria that are registered for use. *Pseudomonas* and *Streptomyces* as well, it looks like. For the fungi, there's three or four of these, and again, you can see it's fairly common type activity where it's soil applied or seed treatment applied, and there are a couple for post harvest controls of fruits and vegetables out there as well.

Okay, with the **benefits**, there's always benefits and concerns about using these things. Microbial pesticides, they have fairly narrow host range, which is good on one point, but as you'll see in the next slide, not so good for another. In terms of commercialization, this does limit them, but in terms of an IPM program where you are trying to target a very specific pest, they're wonderful. They can be very efficacious and I feel, and I think the agency would adopt this, also they are safe and effective alternatives to chemical pesticides. Registration of these things is easier than a new chemical pesticide, so that should get the industry interest a little bit. And we see that they are fairly well supported by consumers



Formulation: There's a lot of things that need to be looked at in formulations, we feel. And we also feel that the companies aren't really quick to deal with formulation of insect pathogens especially. They've got this chemical mentality still. They are starting to learn. We deal with companies quite a bit and try to spread the word. But certainly efficacy improvement is necessary.



We want to get these insects out there to eat these things a little better and we want the beneficial insects not to feed on it, even though it wouldn't be harmful to them, but something like ants can wipe out an application of *mosideopeste* in a matter of hours. It doesn't affect the ants — they just love the wheat bran that this stuff is formulated on. Shelf life improvement formulation can add to that and also field persistence. That's the area we're working on most strongly in Peoria. Personally, that's my personal research area. Where we're trying to extend the activity of these things in direct sunlight for more than a few hours to, say, a few days. And with Bt, we've taken it from two days of residual activity up to a week and with viruses we're going from about two hours to about two days. So we're making some progress; we're trying to get this into the companies so that they'll take a look at it too. And then the valuation, this is also done, but usually this is single component type research.

The concern that we had in the early days was over putting a virus onto a food. We really haven't seen that concern manifested to any great extent. Some of the drawbacks or **limitations** to these things. The *entomopathogens*, these are the inspect pathogens, need to be ingested and this creates a whole new problem for application concerns, so formulation becomes very important. They tend to have a short residual activity. Sunlight breaks them down very quickly. In limited host range, as I said before, for a big commercial company to get involved, they like to see more than a one-target type product. They're fairly expensive to produce. They have to be either grown in live insects for the insect pathogens or fermented and this adds extra cost as well. You just can't take a gallon of oil and make the synthetic pesticide. Stability in the field and the shelf is problematic at this point. There's a lot of research going on in this area too. And then there's the killing time of the viruses I alluded to earlier. In most of these things (Bt is an exception) take a week to two weeks to kill the insect and some of the weed pathogens that are out there, you know, might take a month to kill a really obnoxious weed.

So **what is ARS doing** about this? We actually have research in just about every phase that we could be doing research in these products. We have a very aggressive discovery campaign. Mostly foreign, but there is also a lot of local exploration for new pathogens, new strains that might be effective for various targets.

We are also doing some **genetic manipulation**. We've been contacted by the companies to aid in these efforts. We're looking at various toxins. There's one very interesting project going on right now. They've actually taken an insect hormone, introduced that gene into the virus, and as that gene replicates, it produces this hormone which causes the insect to stop feeding, so it's kind of turning the insect defensive against itself.

Mass production. We do quite a bit of fermentation research within the agency at Peoria. Especially we have a large pile plant scale fermenter to try to scale up these things from a little flask up to say a hundred-liter fermentations. And then in the things that need to be grown in insects, we have a mass rearing facility. We have several of these across the country where we're trying to find very cheap ways to grow insects, such that they can be effective in the pathogen harvest.

We're not involved in the organic farm, on-farm system, to that extent. I'd like to see this changed myself, because it would benefit us a lot to see how these things are doing within an ongoing commercial practice. But certainly ethically, it fits into an integrated pest management system, and also we put host specificity in that too. So this is my web site if you're interested:

http://www.barc.usda.gov/psi/bpdi/bioprod.htm

Question: Where did you get the summary?
Response: There's no summary of all the pathogens. I did this in a few hours earlier from looking at different web sites, calling my colleagues and saying what do you know about this. I've not summarized this in any way formally. I've got a copy of this presentation that I can send to you or give to you now. The more I thought about this, it would be nice to have a central location.

Meeting the Data Needs of the Organic Industry (Part 1)

Speaker # 13: Catherine Greene
USDA – Economic Research Service

Producer and consumer interest in organic farming has spurred a number of public and private data-collection efforts during the 1990's. These efforts are aimed at establishing an organic sector baseline for conducting research, tracking growth and providing an accurate industry snapshot for policy makers.

The small amount of data that has been collected on the U.S. organic sector indicates that organic farming has been a small but fast-growing segment of American agriculture during the 1990's. Rapid growth in the organic industry, continued consumer preference for fewer farm chemicals and scientific uncertainty about the ecological and health impacts of chemical use have underscored the need for better reporting on farming systems that use fewer chemicals.
Good data is the basis for sound decision making, communication, analysis and research in the agriculture industry and within the organic sector. Consumers want to know how much progress we are making with less chemically intensive farming systems, particularly organic systems. Organic farmers need good technical data as well as reliable market data. Agricultural bankers and food

processors need to know how fast the industry is growing, and where they might look to expand their investment opportunities. And market analysts and researchers need good data in order to understand industry segments, make accurate market predictions, and provide sound policy analysis.

Organic Acreage Data Availability: USDA does not currently publish systematic reports on the production, yields and prices of organically grown crops in the U.S. However, USDA did collect data on the amount of farmland operated under organic production systems during the early 1990's, and I am currently in the process of updating the U.S. organic acreage statistics.

USDA reported that 4,050 farmers were using certified organic systems on 1,127,000 acres of U.S. farmland in 1994. About one percent of the total U.S. fruit and vegetable acreage was under certified organic production systems in 1994, a substantially higher proportion than for other grains and other commodity sectors. The number of certified organic farmers increased from 2,841 to 4,060 between 1991 and 1994, according to USDA, and a recent private-sector report indicates that the number of certified growers was nearly 5,000 in 1995. Organic farming systems have gained ground even faster in Europe during the 1990's—about 10 percent of Austrian farmland (309,089 hectares) and almost four percent of Italian farmland (334,176 hectares) is now managed organically, for example—as subsidies have encouraged adoption.

State and commodity reports from the mid-to-late 1990's also provide evidence of rapid expansion in the U.S. organic sector. The Iowa Department of Agriculture and Land Stewardship, for example, reports that Iowa's organic acreage increased from 10,000 to more than nearly 120,000 acres between 1993 and 1998. California's organic farmer registration data shows that there were almost 2,300 organic farmers and handlers in 1998, up almost 50 percent from 1994/95.

USDA's Economic Research Service (ERS) has examined organic production in one commodity sector. ERS estimated that the acreage certified by major certifiers in five top vegetable-producing states increased 47 percent between 1993 and 1996, and has also examined the characteristics of organic vegetable farmers and their production systems.

The Organic Farming Research Foundation (OFRF) conducts a sweeping biennial survey on the characteristics and views of certified organic farmers and their production systems. Many ERS survey results on the socioeconomic characteristics of organic vegetable growers are consistent with OFRF findings for all organic farmers. The most recent OFRF survey also provides evidence of ongoing expansion in organic sector. Over half of the certified organic farmers responding to the 1997 OFRF survey indicated that over the next two years they planned to:

- **Increase the volume of organic product that they market (74% of the respondents)**
- **Increase the number of their markets and buyers (63%)**
- **Increase the number of acres that they have in production (56%)**

USDA Data Collection Projects. I am currently working on a project to estimate the amount of U.S. certified organic acreage in 1997. I contacted 51 certification agencies in January of 1998, and mailed them an acreage reporting form (based on Census categories) in September. Most of the certifiers have responded to the request for data.

One of the biggest obstacles in estimating U.S. organic acreage based on certifier data is that many certifiers don't currently maintain acreage databases. Although some certifiers--California Certified Organic Farmers (CCOF), for example--maintain extremely detailed systems, many certifiers do not. Many certifiers, public and private, have not had funding and resources to devote to database management and have been struggling to provide acreage data.

There is considerable potential in USDA to begin capturing information on acreage, production and prices in the organic sector. Norm Bennett, with USDA's National Agricultural

Statistic Service (NASS), is going to describe NASS's ongoing producer survey and data collection procedures. NASS/ERS producer surveys could be used to estimate U.S. organic acreage, for example, but the existing producer lists would need to be supplemented with the names of certified organic producers.

Terry Long, with USDA's Agricultural Marketing Service (AMS), is going to talk about the potential to collect organic price data which, as we know from the OFRF survey, is among the top data priorities of organic farmers.

In closing, I would like to promote better public-private collaboration on data collection. Public-private collaboration is an increasingly important data collection tool because industry's data needs can be better articulated and data collection procedures can be streamlined.

For More Information:

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- Fernandez-Cornejo, J., C. Greene, R. Penn, and D. Newton (1998). "Organic vegetable production in the U.S.: certified growers and their practices,' American Journal of Alternative Agriculture, Vol. 13, No. 2.
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Catherine Greene is an agricultural economist with the Economic Research Service, USDA, Washington, DC The views presented are those of the author and do not represent the views of any agency or organization.

Meeting the Data Needs of the Organic Industry (Part 2)

Speaker # 14: Norman Bennet
USDA - National Agricultural Statistics Service

For those of you not familiar with NASS, we are the data collection agency for the Department of Agriculture. As you know, or those of you who are familiar with us know, we have quite a number of surveys that we conduct. One of them is the Vegetable Chemical Use Survey. This is just an example of the types of surveys that we do -- where we're able to collect information on integrated pest management, materials that organic producers might be using on their crop, etc. This certainly applies to databases such as Cathy was referring to with a lot of information.

We conduct probability-based surveys so we have a list frame of farmers across the United States and then we select a probability sample from that list frame. Really, the survey can only be as good as the list that we have to sample from. One of the key issues is, particularly in an area like organic farming, our NASS list may not be as good as it should be, but it may be because we don't have the sources for the information that we really need. And this is where Cathy comes into play in trying to get NASS lists of organic producers so that in our list frame of farm producers, we can indicate which producers are organic, and make sure that those individuals are included in our surveys, and they're representative of U.S. organic farmers.

I think that a lot of the data, and ERS could probably address this a lot better than I could, but the data that we've collected since the early nineties off and on for organic practices are a bit spotty and probably we haven't had a lot of responses for the specific questions. We do pick up information on acreage and production for organic producers, and we also then ask some general farm practice type questions. There is always the opportunity for additions of pertinent questions, as the ERS folks know. Now, ERS is probably our biggest partner in data collection, our partner in crime, I guess you could say. But we have worked quite closely over the years in negotiating how to develop these types of survey instruments. It's been a real tough process, and we've come a long way. And we've tried to tailor these to the needs for data collection over the years and as changes in the agriculture sector have occurred, just as in organic farming; we've tried to fine tune those types of questions and collect the type of data that is really important for decision-making.

So that's why I would encourage you once again to cooperate with ERS in providing information on organic growers and stress the importance of what Cathy was talking about. If there's some way that any of you in the audience could assist in obtaining lists of organic producers and provide these to Cathy -- that she could provide to us. We have field offices in forty-four states. Those are the folks that do our survey work. That's where we can do the list building. And then we can accurately sample what they need to find out about organic farming. So we need the lists and then we need cooperation. Where we might need everyone in this room to come into play is once we get the list and get ready to conduct the survey, we also need the encouragement for producers to cooperate.

Throughout all your grower organizations, they need to be aware of the survey efforts that are going on, the types of information that we're trying to collect, and the importance of having that information. It's very difficult for us as a survey organization, when we go out to a farm producer with a 30 to 40-page questionnaire that's going to take a couple of hours of time to fill out, but we don't have any good reasons for the collection of that data. I don't think that's the case with the organic issue. I think it's a very important issue, and so that's why we need the support of industry folks like you. This pretty much addresses where NASS comes into play.

Meeting the Data Needs of the Organic Industry (Part 3)

Speaker # 15: Terry Long
USDA - Agricultural Marketing Service

Cathy gave me a couple of good segues there, but then of course she stole my point and line I was going to use there, so I kind of appreciate her and I'm mad at her too. But interestingly, we looked at this survey, and it kind of echoed some of the things that we put forth in a supplemental budget request to Congress that went in for the year 2000 basically focusing on the

size of the people that are the primary producers in this industry. That is, largely small and medium size producers, unlike a lot of the other segments of industries that we provide information for.

With that being said, let me back up and say what it is that we do. The Agricultural Marketing Service and my branch in particular — Fruit and Vegetable Market News Service — has the mission of tracking price and volume data to facilitate the efficient marketing of goods. By providing transparency we help to keep a level playing field for all the participants. That's usually never more clear and apparent than for small producers who are operating at a disadvantage quite frequently. In fact, this program — Fruit and Vegetable Market News — was begun in 1950 for that very reason. People were operating at a disadvantage with the large buyers. Obviously, nothing has changed in that regard.

Going back to what we're doing currently and what our plans are in the Agricultural Marketing Service: largely, we track very few commodities in the organically produced fruits and vegetable line. Nuts would be one of our commodities as well. However, the proposal that we put forth to Congress as I alluded to for the year 2000 is substantial and would call for significant increase of our staff — possibly 10 percent. The idea being that this is an important and growing segment of the industry, but also goes back to the idea that people that we are focusing on can benefit the most from these types of services; that is, form a transparency that we might have help to provide. They do make up a part of this industry.

So basically that's what we are. We're kind of on the sideline so to speak. We track a few minor commodities, or I should say quantities, that are involved in our wholesale markets. Organically produced carrots, baby lettuces, and a few citrus items, etc. We have identified this as a item that we could include in our strategic plans, and with the support of Congress and perhaps the industry we would be able to provide a lot of the key information that producers in this industry need for marketing their goods.

Question: Can you give us any information about premiums of organic used by either the wholesale or retail level over conventional users?

Response: Can I give you any information, no. I can give that as a clear illustration of why this service that we provide would be important for these people to have this information at hand. Again, the idea being that it helps through leveling the playing field. Currently if you're trading between a large entity, they know this information, but they're not going to share it very broadly. So what are these premiums currently? I can't tell you about this. Certainly we are aware that there is a need there to know what these are.

Beginning to Understand Organic Markets

Speaker # 16: Barry Krisoff
USDA – Economic Research Service

USDA-ERS (the Economic Research Service) is an agency that has faced considerable downsizing over the last 15 years or so and has allocated limited resources to issues related to organic agriculture during this span. However, there are two ERS researchers in this room that have spent a fair amount of time over the years examining organic agriculture: Cathy Greene and Ann Vandeman. Cathy, who helped organize this session, has been working mainly on data and information related to grower demographics, acreage, and production practices. Ann, who will follow me in the talk today, has focused her attention on marketing and consumer issues. I am a

newcomer to the study of organic markets, and since my research is at an early stage, I will limit my comments to a few minutes.

I am part of a team that is initiating an inquiry on organic agriculture markets, a team that includes other researchers from ERS, the Wallace Institute for Alternative Agriculture, and the Universities of Georgia and Massachusetts. The purpose of this team is to try to enhance our general understanding and measurement of organic markets. We are optimistic that, at the end of roughly a two-year period, we will be able to produce a synthesis document that will be titled something like, "Market Developments for Organic Agricultural Products: Implications for Domestic Markets and International Competitiveness." Our research plan stresses the collection and assimilation of data and information, and analysis aimed at (1) examining the market supply chain, supply-side issues from the grower to the processor and the retailer; (2) examining the demand side where we will try to obtain information on price premiums, willingness to pay and other consumer characteristics; and (3) examining the international dimension of organic markets, where we will try to get some sense of sales globally as well as the potential for international trade. Finally, we hope to look at some issues related to public and private certification.

One of our initial efforts has been to consider the demand for frozen organic and conventional vegetables. We collected supermarket scanner data of organic and conventional vegetables for comparison purposes. At this juncture, we have gathered some limited information on price premium, consumer willingness to pay, and the responsiveness of consumers to changes in prices of organic vegetables and the responsiveness of consumer purchases of organic foods when consumer income changes. We will be publishing the results of our findings in ERS's Vegetable and Specialties Situation and Outlook Report, November 1998. The results will also be available on ERS's website.

Again, let me conclude by saying that our project is recently underway and that we look forward to learning more about organic markets, talking with industry representatives and the agricultural economics community, and sharing our insights with you over the course of the next two years. Thank you.

Price Premiums for Organic Fresh and Processed Foods

Speaker # 17: Ann Vandeman
USDA – Economic Research Service

Barry has outlined the work he and colleagues are pursuing on organic markets. Now I will show you some of Barry's data on processed frozen vegetable prices and some additional data on fresh market and processed food prices that my colleagues at ERS and I have been working with.

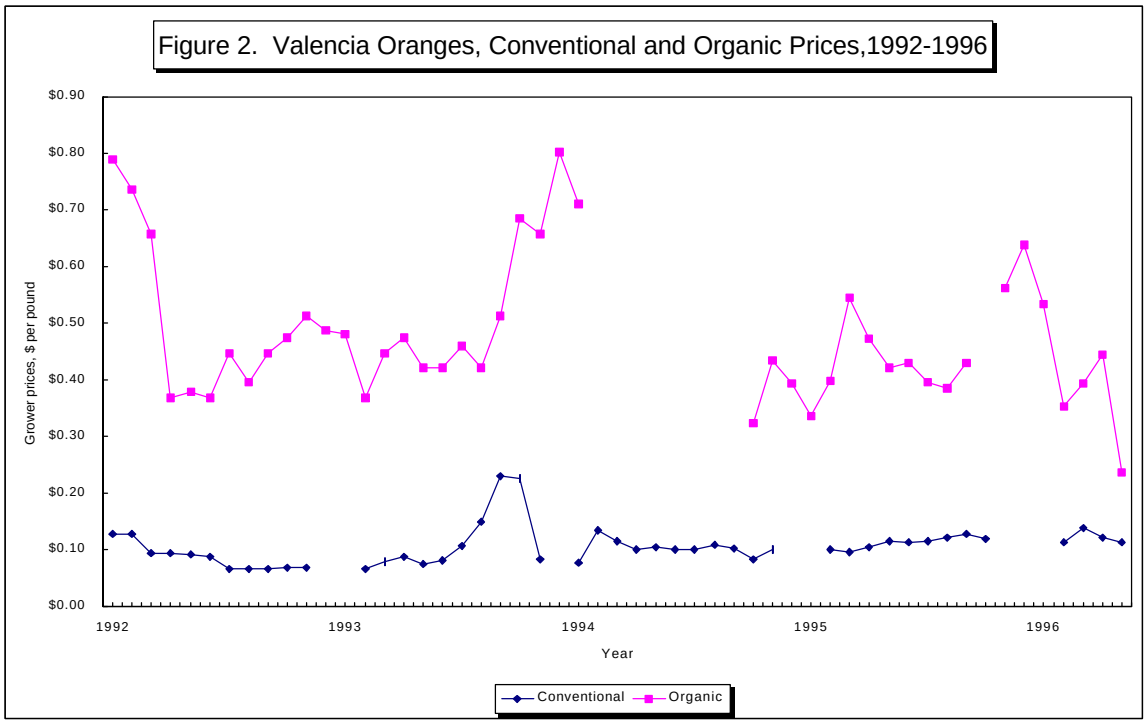
Our objective in pursuing this work is to create a baseline from which we can observe changes in the organic foods market under regulation. Currently, organic standards are set and enforced through certification by around a dozen states and thirty-plus private certifiers throughout the U.S. As you all know, the Organic Foods Production Act of 1990 (OFPA) called for establishing national organic standards and USDA accreditation of organic certifiers. After receiving a record number of public comments on the proposed rules implementing OFPA, which were issued in late 1997, USDA has gone back to the drawing board and is redrafting rules projected for release in 1999. What will happen to price premiums, and to farmers' profits, once uniform national rules are in place? Many of us in the public and private research communities

have been frustrated by the lack of comparable organic and conventional commodity price and production data with which to address such questions.

Organic and Conventional Fresh Produce Prices

In our search for data, my colleague, Phil Brent, found the *Organic Food Business News*, a private source of weekly low and high farmgate prices for selected organic commodities. We calculated simple average monthly prices from these data to create series that are comparable to the conventional price data reported by USDA's National Agricultural Statistics Service (NASS). One of the strengths of these organic price data is that they have been reported consistently for the past several years, allowing some examination of trends in price premiums since 1990, a period of rapid growth in organic food sales. Farmgate and wholesale price data are collected from a weekly survey of farmers, commodity buyers, traders and shippers in eight states (California, Pennsylvania, Idaho, Minnesota, Texas, Michigan, Florida and North Dakota). The sample frame is of unknown quality. However, until a regular public program of organic price data collection is established at the federal level, these data are the best available to represent average national prices in fresh organic produce. Tom Dobbs published his analyses of selected grain price data from this same source in *Choices* magazine earlier this year. Using a similar approach, we looked at fresh fruits and vegetables.

USDA-NASS reports US average fresh produce prices for the most common commodities monthly, whereas the private sector-supplied organic prices were reported on a weekly or semi-monthly basis. In the absence of organic production data which could be used to calculate weighted average prices, we chose to calculate a simple monthly average from the midpoint of the low and high prices reported weekly or less frequently in the *Organic Food Business News*. We converted all prices to dollars per pound using standard shipping container sizes supplied by the Produce Marketing Association. We matched like commodities as closely as possible. That is, where NASS reports a price for all apples, we compared this price with the price of organic red delicious apples (the major conventional variety) and similarly for russet potatoes, generic tomatoes and table carrots. We used organic and conventional Valencia orange prices rather than prices for navel oranges because the organic Valencia data were more complete over the time period we examined.



A **lack of reliable supplies** of organic produce of consistent quality was a common complaint and reason cited by retailers for not committing shelf space to these products in the early 1990s. With improvements in storage, production expansion and increased imports of fresh conventional produce, consumers and retailers have become accustomed to high quality produce being available year round. The gaps in the time series of organic prices for the commodities we examined are indicative of the seasonal supply variability in this market. Price data are somewhat more complete after 1991, so we report premiums only for 1992 to mid-1996 for most commodities.

Figures 1-5 (figures 1 & 5 not shown here) compare price series for selected organic and conventional produce. The figures reveal gaps in the organic data, mentioned above, caused by seasonal variations in supply. Over the four years covered by the data, however, existing trends should be visible. Several features bear mention and closer examination. First is the somewhat surprising result that no trends are evident in the price relationship between conventional and organic produce. While the data show organic prices to be quite volatile, since 1990, premiums in the commodities examined do not appear to be increasing or decreasing. Only in oranges is there the appearance of a possible trend in the premium, which declines slightly over the period. Consequently, overall the data provide no clue regarding how price relationships might change following implementation of national organic standards.

Second, the **premiums** estimated here quite consistently exceed 100 percent. This may be due to the prices used. Most studies have calculated premiums at the retail level rather than at the farmgate, as we did here. If marketing margins for organic produce are narrower, such that growers receive a higher proportion of the retail value of their commodity in the organic than in the conventional market as some industry watchers suggest, then we would expect to see higher premiums on prices measured at the farm level. Comparing our estimates with wholesale premiums for organic produce in California collected by the Organic Market News Information Service (OMNIS) during 1992 and 1993 seems to bear this out. In August 1993 for example, we calculate a premium of 191 percent for red delicious apples and OMNIS data show a premium of 116 percent. In the OMNIS data, broccoli premiums were 135 and 98 percent in March 1993 and October 1992, respectively, compared to 170 and 127 percent from our data.

Third, these graphs suggest that organic prices are quite variable. Supply variability at the farm level in what is still a relatively new market, regional variation in supply, a limited number of suppliers and the greater perishability that limits storage of organic produce probably all contribute to the price variation observed. However, a comparison of coefficients of variation, which provide a unitless measure of relative variability, indicate that conventional prices may actually be more variable relative to the mean than organic prices.

These data show that **expansion in the organic market**, as evidenced by sales figures increasing by about 20 percent per year in the 1990s, has not yet led to declining prices for organic produce. Assume supplies will increase relative to the conventional substitutes when national standards defining and governing the production and labeling of organic food are in place. Then important demand factors affecting organic price premiums will include consumers' perceptions of health benefits or health risk reduction from eating organic. On the one hand, the use of one nationally recognized and approved definition for organic food may increase consumer confidence in organic products and lead to an increase in demand, preserving price premiums. On the other hand, consumers may find that their perceived benefits are lower once the distinction between organic and pesticide residue free food is more clearly understood, leading to reduced demand and reduced premiums for organic products.

Figure 3. Broccoli, conventional and organic grower prices,1992-1996

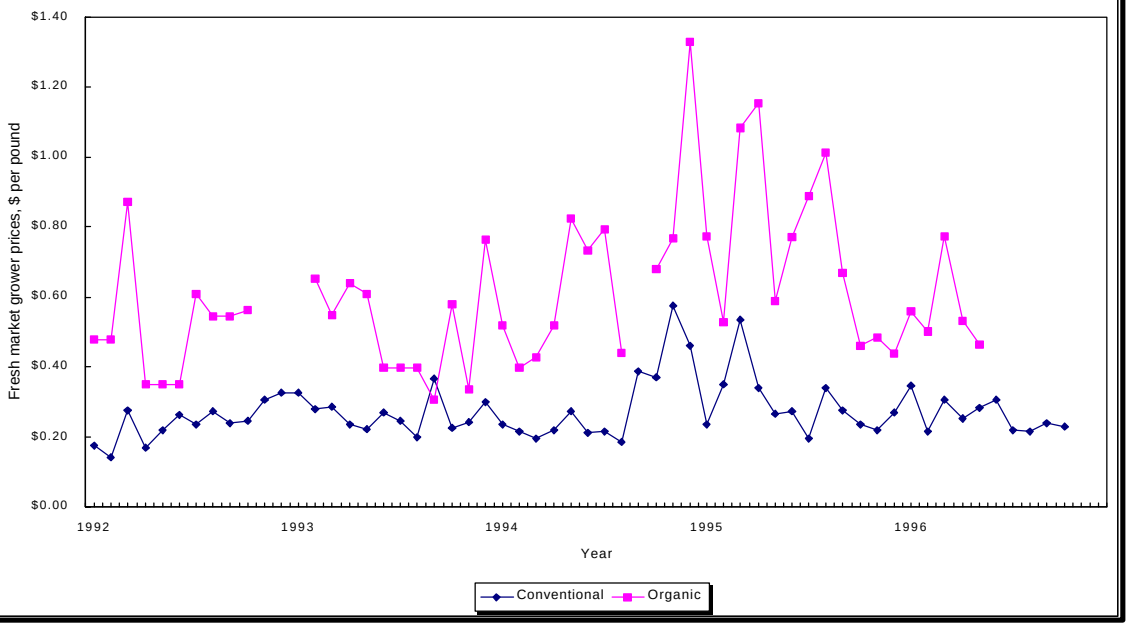
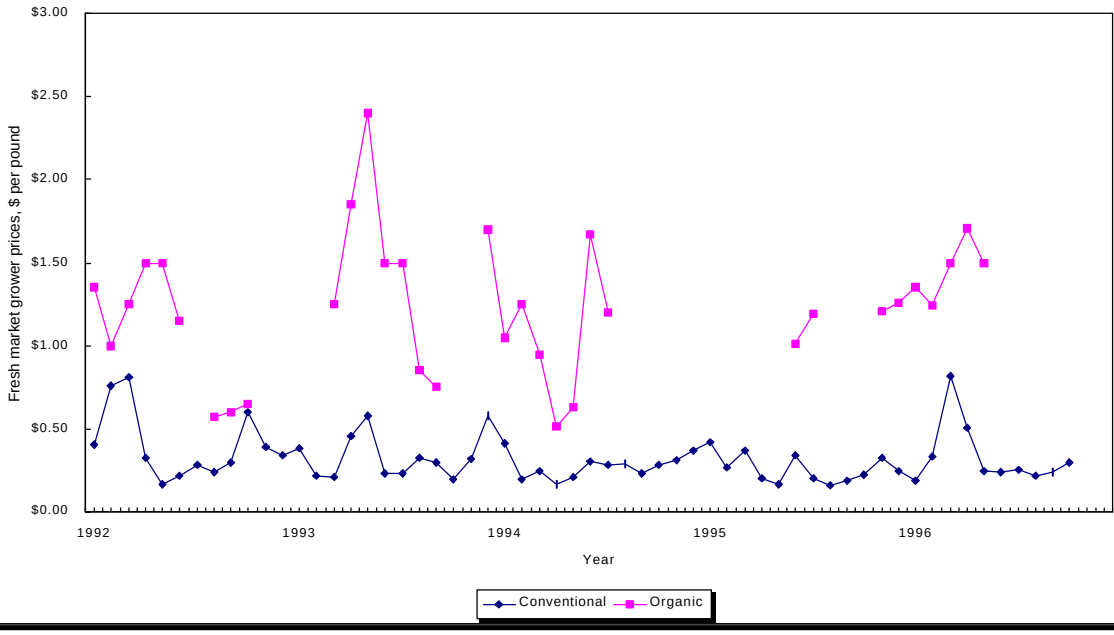


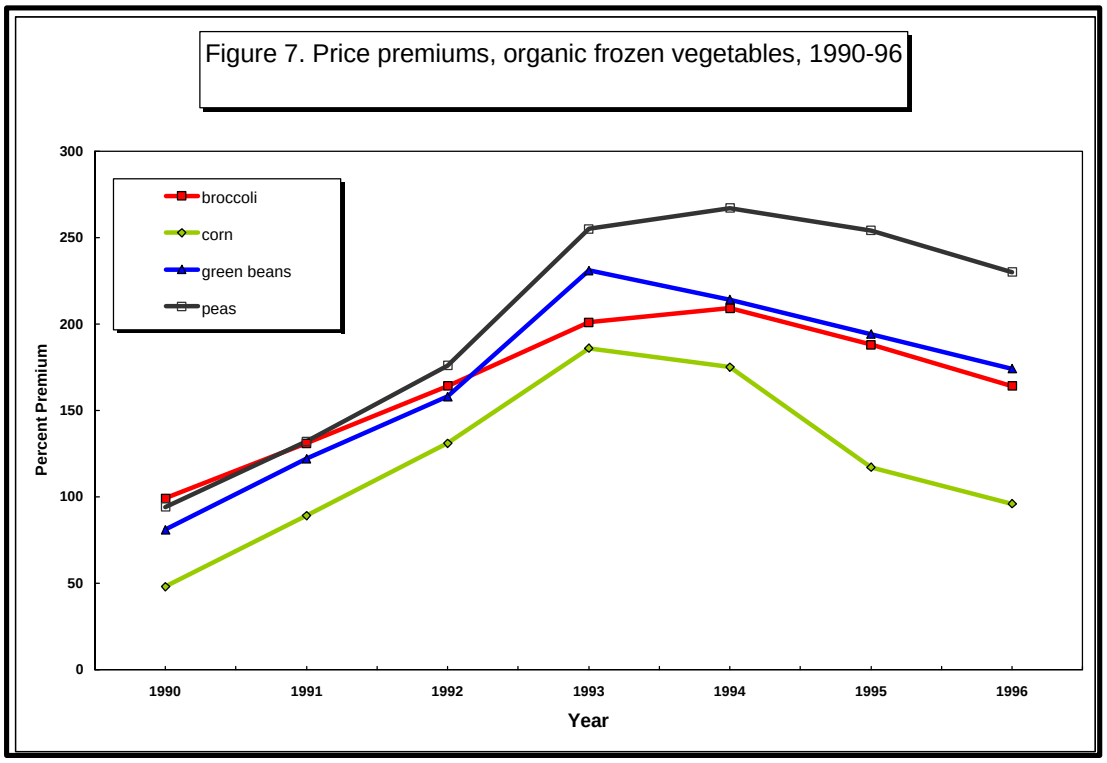
Figure 4. Tomatoes, conventional and organic grower prices,1992-1996



Price Premiums for Organic Processed Foods

Sales of processed organic food products have become an important component of organic food sales. According to the *Natural Foods Merchandiser*, processed organic foods accounted for 61 percent of all organic food sales in natural food stores in 1995. The retail price premiums were estimated using Nielsen Marketing Research data from a representative sample of conventional food stores. Nielsen collects scanner data on all UPC-coded food items at the point of sale. Their database represents around 82 percent of the total volume of items sold in food stores in the United States. The Nielsen data we used here contain information on food items sold in U.S. food stores with sales of $2 million or more each year during the calendar years 1991 through 1995. Each of the categories of organic processed products we analyzed commanded premiums when sold in mainstream food stores. However, the premiums show wide variation across product categories. The lowest premium occurred for cereals at 5 percent. Flour had the highest premium at 294 percent. We don't know what accounts for the variation, but here again more data would be helpful. For instance, these price premiums are calculated on only the portion of sales of organic processed foods in conventional food stores.

We do not know how these premiums would compare with an average premium calculated over all sales of these products, including the majority of sales from natural food stores and all brands. In 1997, there were about 450 companies producing processed organic foods, but only about a dozen companies account for the sales of processed organic food in conventional food stores appearing in the Nielsen data. For instance, one company, Earth's Best, accounted for all organic baby food sales in the database. The price premium we estimated for these products was about 20 percent. Three companies had organic cereal sales in conventional stores large enough to be picked up in the database, and two companies accounted for all organic flour sales.



The data in **Figure 7** come from the same database. Barry Krisoff and his colleagues calculated organic and conventional prices for selected frozen vegetables to examine changes in prices and price premiums over time. I graphed their data in Figure 7, showing the price premiums for frozen broccoli, corn, green beans and peas from 1990 to 1996. These include data on organic

prices again from a single company, Cascadian Farms. Unlike with the fresh produce data, these data show a uniform trend of increasing premiums in the early 1990s followed by a more gradual decline up to 1996. The premiums for all but peas remained well above 100 percent after 1990.

That's all I have for now. We sure could use some help in just understanding what's going on with the data, and some assurance that the data are worth looking at and have something to tell us. I would like to get other researchers interested in doing more market and price analysis at the national level. I hope that interest will increase as more organic products enter conventional food stores and the quality of private data such as those used for this analysis improves.

International Issues Pertaining to Organic Agriculture

Speaker #18: Janise Zygmont
USDA - Foreign Agricultural Service

I bring a little different dimension to this discussion because I'm not a researcher and FAS's mission is not to do research. We rely on ERS to do that for us. The primary mission of the Foreign Agricultural Service is to facilitate exports of U.S. ag commodities and products. And what FAS does is to try to identify opportunities and through outreach efforts tell the American producer about the opportunities out there in the international market and also to monitor and participate in international trade policy issues to ensure our continued competitiveness.

The FAS role is really evolving and changing and will continue to grow as this market grows. As we (USDA) develop our national organic standards, at the same time, other countries are developing their own organic national standards. We have an interest in selling our product overseas as our domestic market becomes saturated in certain product categories, and also we're interested in sources of ingredients to keep our industry going.

What I'm here to do is to tell you a little bit about some **resources** FAS has available to those researchers who are interested in the international arena. And I have a handout for anyone who is interested. I start with the FAS home page. This has a wealth of information about services to producers to help get their product out there. The primary thing for researchers is our series of attaché reports that have started to come in on a voluntary basis from our posts overseas.

I have a listing that's up to two pages long now of reports that have come in that describe the consumer market by country specifically for organics and then we have another set of reports that talk about the country in general. It gives you good background information about consumer base, distribution system and important information if you as a producer or as an exporter are interested in finding out more about that market. Do I have a product that's going to interest this market? These reports are available on our web site. And again, I urge you to take that handout if you have any interest in it at all.

The other thing that I want to point out is that my position (and that of my colleague who's also in the audience) was created about a year and a half ago by FAS as sort of a central contact point for questions about organics that are coming in from the field, both here and overseas. We started an e-mail newsletter that until just a few months ago was for internal use only, just to make the FAS community aware of what's going on out there in the world of organic, but we have expanded that and now it's available on the organics home page and that is also here on the web site. What we try to do is to highlight and summarize the reports that are coming out of

the attaché offices, and news gleaned from any and every source about what's going on in the world of organic.

One more comment I have, as I said **FAS is not a research organization**. We need to rely on the research community to do that kind of investigation for us and I'll just throw out a couple of topics that we see as very relevant for future research needs. First of all, consumer research in the international market. What are consumers interested in? What new products do they want? What are their motivations and what is their willingness to pay? We're also interested in looking at government subsidies of organic in other countries. We know already that the EU subsidizes the transition to organic; we know that a country like the Netherlands has government educational programs to teach the populace about organic and those benefits. Another important issue we think is fumigation alternatives. When we're trying to get fresh organic produce into a market, we have a challenge: if the product is fumigated then, of course, you can't sell it as organic and you lose the price premium. Who wants to take the risk? So that's another thing: any kind of barriers to trade.

COUNTRY REPORTS - Another source of information available at FAS's Homepage is the Annual Marketing Plan, a comprehensive report--by country--that provides important information for anyone researching export opportunities such as demographics, consumer and producer sectors, packaging, distribution channels, as well as an assessment of the market for U.S. commodities and products. Although not organic-specific, in countries where the organic/health food market is important, the report will likely cover it to some extent. To access these reports:

1. Go to the FAS Homepage: ***<http://www.fas.usda.gov/>***
2. Click on the word **Search** in the blue title bar to access the FAS Search Engines.
3. Click on the first green heading titled **Attaché Reports**.
4. Click on the box **Custom Date** to assure your search will pick up this report.
5. Click on the **previous year** because a new report may not have been submitted yet for the present year.
6. Select **Annual Marketing Plan**.
7. Select the **country** you're interested in.
8. Click on **Submi**t. The title of the report you selected will show on your screen.

To view it, click on the **AGR Number** which is highlighted in blue.

The costs: the costs are very important. What is the cost of the organic certification program? And as we develop our national standards, what costs are going to be involved and how is that going to impact on trade? As it has been alluded to already, we don't have any trade data. We need basic production, supply, demand and trade data. And that will come in time. And another issue I'll just throw out is on handling standards. Our national organic program has very strict handling standards. We're interested in knowing what is going on in the other countries as far as assuring organic integrity over time, and that the organic integrity of a product that comes from overseas is going to be preserved once it gets here and it reaches the consumer. So that's very quick, but that's the FAS role and if you have any questions, I'd be glad to answer them.

HOW TO SEARCH FOR ATTACHE REPORTS ON THE FAS HOMEPAGE

ORGANIC REPORTS- Voluntary organic reports prepared by attaches in selected countries (see attached sheets) are available via the Internet. To access these reports you can either:

1. Go to the FAS Homepage: **< *http://www.fas.usda.gov/>***
2. Click on the word **Search** in the blue title bar to access the FAS Search Engines page.
3. Click on the first green heading titled **Attaché Reports**.
4. Hit the **"Page Down"** key once and find **AGR Number**. Click on the circle to the left of *AGR Number* to select this option, type (in the empty slot) the number of the report you want (see attached sheet), and click on **Submit**.
5. The title of the report you selected will show on your screen.
6. To view it, click on the **AGR Number** which is highlighted in blue.

OR ALTERNATIVELY, you can simply search for key words at the site by following steps 1 through 3 above, then check "Find Subject" and type in one of the following terms:
organic, organics, health food, natural food, ecology, or ecological.

List of Organic Attaché Reports Not Available at the FAS Web Site

1. **"U.S. Export Opportunities in Japan for Organic Food Products," May 1997.**
2. **"Study of French Retail & Wholesale Market for Organic Foods," Dec. 1997.**
3. **"Health, Dietetic and Functional Food in the Benelux," February 1998.**
4. **"Vegetarian Food in the Benelux," February 1998.**
5. **"The Dutch Organic Food Market Offers Potential for Growth," March 1998.**
6. **"The European Organic Food Market," March 1998.**

To obtain reports #1, #3 and #4, contact Janise Zygmont at 202-720-1176.
To obtain reports #2, #5 and #6, contact Mark Smith at 202-720-0103.

Prepared by USDA/Foreign Agricultural Service/HTP Organics Staff at 202-720-1176 or 202-690-1341. October 1998.

Local, Grass-fed Beef: Production and Marketing Concerns

Speaker # 19: Jenny Warden
Piedmont Farm Marketing Project

I'm Director of the Piedmont Farm Marketing Project which just started. It's funded by the Piedmont Environmental Council in western Virginia, and what we're trying to do is support and provide more opportunities for small farms in the Piedmont and beyond. We can roll this out if we get it going in the Piedmont, because we have good market segments in the urban centers of Washington, DC, Charlottesville, Richmond and other urban centers. The Hartman Report found that some, up to 42 percent of American consumers expressed some preference for naturally produced foods. We're looking at the restaurants and particularly the chefs that have joined Chefs Collaborative 2000 that are contracting with organic growers to grow their food. This new wave, after CSAs (Community Supported Agriculture), is "RSAs" (Restaurant Supported Agriculture). So we're looking at those less price sensitive segments to earn premium wholesale or retail or premium-retail prices for core producers of the Piedmont Farm. The first food product that we're addressing is beef, so we're looking at a model where the animal stays in the state, a more ecologically friendly grass-fed system of getting finished out, slaughtered locally and then marketed through a variety of mechanisms but none of which try to compete with the conventionally produced animal. So thanks.

Greening the Food System

Speaker #20: Ann Thrupp
World Resources Institute

My name is Ann Thrupp and I am Director of Sustainable Agriculture at the World Resources Institute. For those of you who are unfamiliar with WRI, I'd like to mention that it is a non-profit organization that mainly does independent policy research on international environmental issues and sustainable development. It is sometimes considered a "think-tank," but we also undertake activities that are intended to influence policies and practices, including information dissemination, policy dialogue, workshops, outreach activities, and educational projects. Our programs include forestry, agriculture, climate change, economics, biodiversity, environmental education and sustainable enterprises, so it covers a large range. We have done a significant amount of work on sustainable agriculture in the U.S. and internationally.

What I am going to describe today briefly is a project that we're just beginning called "Greening the Food System." This is a good time to get input from other people, and we appreciate feedback. We've received some funding from the EPA for the project, and appreciate

that support. By way of background, I'd like to summarize why we got involved in this work in U.S. organic sustainable agriculture. One of the studies we did two years ago addressed agricultural export products and markets from Latin America, and it focused on the sustainability and equity challenges associated with conventional export-oriented agriculture. This project revealed major problems tied to intensive use of pesticides in vegetable and fruit production for export. Almost all the vegetables and fruits that are exported to U.S. consumers are produced with heavy inputs of agrochemicals. This causes harms and hazards to farm workers, and also leads to excessive residues in the produce, and sometimes has resulted in rejections through the market inspection process, when residue standards are violated. The analysis also revealed inequities tied to the export development strategy, because small farmers seldom can benefit from investments in the export market, and local people continue to suffer from food insecurity. We analyzed this issue at the field level, carried out workshops with multiple groups in Latin America, and then published a book on the subject, called *Bittersweet Harvests for Global Supermarkets.* The problems we identified sparked interest in alternative farming practices and markets, and particularly opportunities for organic production and marketing.

After that, we carried out another project called **New Partnerships for Sustainable Agriculture,** which includes case studies on integrated pest management in both developing and developed countries. This project identified factors of success and major barriers being confronted in the transition to alternative agriculture. The most recent project is on Agrobiodiversity and Food Security, and resulted in a report called ***Cultivating Diversity***, addressing the functions and threats to agricultural biodiversity. Reports from these projects are available to you from WRI, if you're interested.

These previous projects, and other experiences led to the development of the project we call "Greening the Food System." The objectives of the project are to:

- **Identify effective incentives and factors contributing to the growth in "green" food systems (meaning environmentally, economically, and socially sustainable systems of production and marketing);**

- **Identify the main barriers to the expansion of green approaches and enterprise in the food system;**

- **Disseminate the lessons learned about sustainable food systems, through user-friendly reports, outreach activities, and educational means.**

- **Multiply successes in green food systems by promoting and strengthening effective linkages and capacities in the supply chain, overcoming barriers, and diversifying equitable opportunities for innovative enterprises.**

As part of this project, we're trying to address people and organizations who are often not included in discussions of sustainability and organic food. We're aiming to show policy makers and others the benefits associated with the changes, and the connections between many parts of organic and sustainable food systems. In other words, we're taking a holistic perspective and want to reach a wider audience.

As background context to the project, it's important to understand that there is an overall rapid growth of the sustainable/organic food sector, as you know. The opportunities in this sector are multiplying. In addition, government agencies are establishing policies to support this trend, as well as passing increasingly strict legal measures over chemical-intensive production. For example,

in the state of California, government agencies have created incentives for pesticide reduction, awards for innovations in integrated pesticide management, while also strengthening pesticide-monitoring systems. There are additional market incentives, including price premiums, that are also inducing changes.

However, despite the tremendous growth and the successes in this sector, it's important to recognize that the market sector for organic and sustainably-produced food is still a small portion, which represents only a minor percentage of the overall food markets. In the U.S., for example, organic food is just 2% of the overall market. Moreover, there is a lack of understanding of what specific factors are impeding expansion, and what factors are contributing to success, in areas of growth. There are still major challenges and questions that we are trying to address in this project, i.e., what factors can facilitate and promote broader success? And what should we do to help overcome the barriers?

Based on early analysis in the project, we have identified hypotheses about some of the key factors:

1. Linkages: The alliances between many companies or actors in the food system is an important factor in facilitating the growth of this alternative "green" sector. In other words, the effective connections between producers, processors, marketing companies and consumers are very important in enabling changes. Analysts tend to separate the market dimensions from the production dimensions. But the linkage must not be overlooked. Farmers may be able to produce organically, but if you can't get the produce to market, and can't create consumer demand, it doesn't work. If the consumer demand is not met, it's also difficult.

2. Innovation: At the same time, innovation in production and marketing is critical, to ensure it is economical as well as ecologically sound. Companies with more creativity are likely to be more successful. In marketing, for example, innovations include the Community Supported Agriculture (CSA) system, farmer's markets, direct marketing to organic restaurants and other opportunities that are being developed. Usually trying a diversity of channels and means can be helpful. Of course, innovations in the production systems are also vital to develop ecologically sound practices. Farmers need to be willing to experiment and try out new ideas.

3. Networking: Similar to the formation of linkages, networking and exchange between companies and other sources are also important. Companies in this system need to be concerned about the formation of networks that serve marketing purposes efficiently, as well as networking among other growers.

4. Knowledge: Information is so critical in these processes. It is vital for companies to have access to information sources on organic/sustainable practices, and to know where/how to contact the right people, organizations, and information sources. Organic and sustainable systems of production are known to be knowledge-intensive, rather than technology and chemical intensive. Growers need to gain knowledge from many sources about local agroecological conditions, and about the principles and options in farming. Knowledge about multiple functions of sustainable practices is also important. For example, in grapes and other fruit farming systems, cover crops are proving to be particularly useful, serving multiple functions for soil fertility, soil conservation, moisture retention, pest/disease control, and biodiversity enhancement. Knowledge about such practices and principles can be gained through extension services, private advisors, computerized

sources, guidebooks, neighbors, scientists, etc. Marketing systems also require extensive knowledge of market opportunities, through a variety of information sources.

5. Support by Policy: Support for sustainable agriculture from policies and institutions is another factor that contributes to the growth of the green food system. If the prevailing policy environment is not conducive to such production, then it is very difficult to develop these alternatives. In fact, in many parts of the U.S., and in other countries, many policies are contradictory to these kind of changes. Subsidies, tax policies, credit policies, and many other land-use policies have favored and induced conventional, industrial, chemical-intensive agriculture. Changes of such policies allows for possibilities to bloom.

These five factors together spell out the acronym **L-I-N-K-S**, alluding to linkages. We are exploring these factors, since they appear to be very important influences. On the other hand, if these elements are weak or missing, they represent barriers in many situations. So the goal in this effort is to build strong linkages, policies to promote integrated food systems in helping to facilitate these connections between the different actors, and to work towards overcoming barriers.

Methodologically, the way we are analyzing these issues is through case studies in a pioneer region, particularly in the western region of the U.S. (We're not doing an elaborate macro analysis on the trends, which has already been done and is being done by some people such as Julie Dunn and some people recently in the USDA.) We focus on examples where there is progress in developing such alternatives, mainly in the fruit and vegetable industry, which is really making a major conversion. Six case studies are being developed to identify factors of success and the barriers. A diversity of companies and examples are included, to understand a range of approaches. We also want to work with enterprises that are concerned about social issues as well as ecological matters. Since WRI is an international organization, we're very interested in how this connects with Latin America. Some of the fruit and vegetable producers are importing from abroad, contracting with farmers who supply the produce from Latin America. They are therefore spreading some of these ideas on organic/sustainable production. Sometimes, local farmers have indigenous knowledge to contribute to organic production systems as well. We encourage the producers/collaborators in the project to work on the research with us, in a participatory approach, to reflect on and learn from their own experiences. After the case studies are finished, we will hold a small workshop among representatives of the case studies, convening the people involved in the studies and other experts, in order to discuss the findings and identify common elements.

Most of the case studies will be pursuing organic production, but we'll also include those who are pursuing "sustainable" approaches, but do not want to go organic. In some ways, it would be preferable to cover just organic, but there is value of addressing both, to have a diversity of approaches. For example, in the wine grape industry, some producers are choosing not to use organic certification *per se*, because they think it is too confined to a list of products. Yet, they are introducing practices on soil/water conservation and wider watershed management that go beyond organic certification rules. So, we hope to gain insights from the study that will be useful to a wide range of companies and producers.

One of the interesting challenges in this sector is that the organic produce is mainly reaching and benefiting high-income consumers, and less often reaches middle and low-income people and/or ethnic minorities. What we see is a tremendous opportunity to actually expand that range of beneficiaries. One way that this can happen is by reducing prices on organic products. However, this poses a dilemma or tension, because price reduction is seldom possible or beneficial for the growers, since organic production often requires higher labor costs. But there are good experiences of other ways to expand the range of organic consumers/beneficiaries, for example, by involving low-income neighborhoods in organic gardens, targeting lower-income farmer's markets,

and providing educational material. Expanding international markets in developing countries can also offer opportunities for poor farmers to gain income through producing organic products that are exported to the North. We will not be addressing this equity challenge in depth through these case studies, but it is something requiring attention, as part of the effort to support social responsibility as well as environmental soundness.

Question: You mentioned that organic foods are only about 2 percent of the market. Many organic proponents aspire to increase that number to 5 percent or more. Yet, if we exceed 5 percent, there is concern that the large companies, i.e., the "big guys," are going to move in and take over the market. It's already happening: an example is how Whole Foods is taking over and buying out many businesses, and now has already started producing their own line of produce and products. They're taking up quite a bit of their own shelves, and they're pushing other companies off their shelves.

Response: This issue of concentration and takeovers by large companies is an important concern. We're very interested in addressing this matter in the case studies, and to understand if/how this is affecting the companies involved. In fact, the consolidation and structure of the industry is something some other researchers in California have been addressing. It is increasingly happening in the western region, and all over the U.S. And there's a lot of concern among the pioneers of the organic movement, seeing that this is now becoming a big business. This change can possibly have certain advantages in terms of making organic food more accessible to a wider variety of consumers, but it does have clear disadvantages and drives out smaller farmers and businesses. So there are dilemmas associated with the whole structure of the market and changes and consolidation. In fact, there was a conference on organic marketing and business about two years ago in California, which attracted major businesses. There's even venture capital involved. And major transnational companies are also investing a small portion of their own production and marketing into organic. Interest in organic products is therefore growing rapidly and there are definitely projections that this could be a major portion of our consumption in North America by the year 2010, given consumer demand too. Health interests have driven part of this.

Question: **Did you say you are including six cases? Which companies?**

Response: We're just starting on the case studies. We've done significant background analysis first. I shouldn't specify all the names yet because we're not yet positive. We are including a combination of smaller or medium-scale and large-scale. We're definitely going to include Del Cabo, which is a fruit and vegetable producer, that's linked into Mexico. It's a small business, but it's extremely successful in their growth, and they have a very small and socially oriented component in their business too, because they are doing a lot of contracting with small farmers in cooperatives. It's American based, with production in North America as well as Mexico. Another one that we're very likely to include is Fetzer, wine grapes, and maybe Pavich Family Farms, which produces mainly table grapes. We're going to do the fruits and vegetables because it's just where so much is happening. The selection of this different group can create some methodological challenges -- i.e., we have "apples and oranges." But I think that nevertheless we'll be able to draw some principles in common, and also make interesting comparisons.

Question: Are you including conventional producers, for comparison?

Response: No. We're not going to do conventional that are very traditional. Some are conventional but they're using integrated pest management. It is reasonable to look at examples that are not purely organic, to see how companies have opportunities of change, not being certified but yet farming more or less by sustainable standards.

Question: Are you going to utilize eco-labeling and other types of procedures like that? Also, there's a substance question to that, if you are going to use those, what kind of policies or procedures are you going to use to alert consumers as to the type of labeling you're going to use?
Response: We'll analyze the types of labels and procedures being used, as part of the case studies, to understand whether and how they are using labeling (and other similar means) to inform consumers. This varies greatly among companies. It's helpful to appreciate what labels the companies are using and what has been more successful or less successful in the labeling procedures. But we do not intend to develop a labeling procedure; that's not the purpose. Some have chosen to label and others haven't.

Question: What is WRI's position on genetic engineering of food crops?
Response: We don't have an Institute stand on this. WRI doesn't take "political" stands on such issues. However, this issue is mentioned in the most recent publication we did on agricultural diversity, called ***Cultivating Diversity***. This publication raises concerns about the development of genetically modified organisms which are being developed in ways that exacerbate the reduction of biodiversity and perpetuate the monoculturization of agriculture. These trends are opposite of what is desired in organic and sustainable agriculture. Most of the innovations that are currently emerging by the biotechnology companies are going to be used and commercialized widely, and they are perpetuating the chemical-intensive orientation and the Green Revolution model, typical of industrial agriculture technologies. So they have negative implications in this sense. They also pose significant ecological hazards and potentially health hazards -- which are poorly understood. These are major problems in the current patterns. I believe that there could be potential through the use of biotechnology for doing things like enhancing the function of microbes in the soil, or nitrogen fixation or drought resistance that could be beneficial if used in diverse systems. But this kind of discovery is not happening currently, as long as the companies are perpetuating the chemical intensive, technology intensive, monocultural production system. This fuels the conventional sort of interest of particular companies. We don't think that is appropriate or sustainable. But this is my opinion, and there are different perspectives on this even in my own institution.

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