



GM crops stir the fires of world debate

New ATTRA publication is a handy primer on this very complex topic

Genetic engineering of agricultural crops has stirred up a tempest of international controversy in recent years. As the debate rages, many farmers worldwide are not waiting to hear the final verdict. Last year, more than 100 million acres of the world's farmland were planted with transgenic crops. The U.S. leads the world, with 71 million acres planted to genetically manufactured (GM) crops in the year 2000, mostly corn and soybeans. In the year 2001, more than 60 percent of soybeans planted in the U.S. were estimated to be transgenic. Other transgenic crops planted in the U.S. include corn, cotton, canola, tomatoes, potatoes, sunflowers, peanuts and sweet mini-peppers. More transgenic crops, including rice, are under development for commercial use in the near future.

Many of us who find the debate about this complex and controversial scientific process more than a little confusing can order a new 34-page publication written by NCAT/ATTRA Agriculture Specialist Nancy Matheson. *Genetic Engineering of Crop Plants: What Farmers Need to Know about Transgenic Crops*, explains the process of gene transfer in agricultural (See GM Crops on page 4)



Nancy Matheson (center) poses on her Montana farm with fellow NCAT agricultural specialist Mike Morris (right) and Joanda Crosby, sustainable agriculture program director at Alternative Energy Resources Organization (AERO) of Helena, MT.

Some sustainable ag programs gain ground in FY02 budget

By Margaret Krome

Campaign for Sustainable Agriculture

The National Campaign for Sustainable Agriculture's FY02 funding campaign resulted in significant increases for many of the programs that the Campaign's membership had prioritized this year. These include:

- ✓ Sustainable Agriculture Research and Education program, which received total funding across its two subprograms of \$17.25 million (increase of \$4.15 million)
- ✓ Appropriate Technology Transfer for Rural Areas (ATTRA) \$2.5 million (increase of \$.5 million)
- ✓ Section 406 Organic Farming Systems Research Program \$1.5 million (increase

of \$1 million)

ATTRA & SARE receive funding increase See charts on page 2.

Market Nutrition Program \$25 million, and Seniors Farmers' Market Nutrition Program \$10 million.

Other programs cut

The Wetlands Reserve Program, Farmland Protection Program, Wildlife Habitat Incentives Program and the Conservation Farm Options program (See FY2002 Funding on page 2)

- ✓ Rural Cooperative Development Grants Program \$5.25 million (\$750,000 increase)
- ✓ Farmers'

ATTRA news briefs

'Profitable Pork' available

Call ATTRA to obtain a free copy of *Profitable Pork: Strategies for Hog Producers*, a new publication from the USDA Sustainable Agriculture Research and Education (SARE) Program. The 16-page publication discusses alternative hog production systems such as deep straw farrowing, hooped shelters and pasture production. Sections on marketing discuss niche, cooperative and organic marketing. Farmers are also directed to other free informational resources in print and on the Internet. The publication is also available at the SARE website: www.sare.org/bulletin/hogs.

Order bulk ATTRA materials

As the 2001 farming season winds down and farm groups gear up for their winter meetings, organizers of these events can request free bulk copies of the ATTRA Publications List and ATTRA Brochure for distribution to attendees. Also available for display are sample copies of the 170-plus sustainable agriculture information packets that are listed in the Publications List.

To order informational materials at least two weeks in advance of your upcoming farm event, please dial 1-800-346-9140 from 8 a.m. to 5 p.m. (Central Time) Monday through Friday.

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'Monitor your soil, water, plants & nutrients,' Bellows tells graziers

Anyone involved with managing pastures for livestock production will concede there is much more than meets the eye in gauging the health of a forage system. But as NCAT/ATTRA Agriculture Specialist Barbara Bellows writes in a newly updated ATTRA publication, *Nutrient Cycling in Pastures*, most graziers continue to measure production and profitability on what is visible to them – stocking density, vigor of plant re-growth and plant diversity.

Monitoring pastures

“Do you know how much water seeps into your soil and how much runs off the land into gullies and streams?” Bellows asks ranchers in the introduction of the 57-page information packet. “Do you monitor how efficiently your plants are taking in carbon and forming new leaves, stems and roots through photosynthesis? Do you know how nitrogen and phosphorus are being used, cycled and conserved on your farm?”

To help ranchers find answers to these questions, *Nutrient Cycling in Pastures* provides basic descriptions of how water, carbon, nitrogen and phosphorus cycles work. The publication then explains in-depth,



Barbara Bellows

Nutrient Cycling in Pastures is available free of charge by calling ATTRA from 8 a.m. to 5 p.m. (Central Time) Monday through Friday at 800-346-9140, or by visiting our website at www.attra.ncat.org.

with the help of charts and other graphic elements, how efficient management of these cycles can improve forage and livestock production, soil health and water quality.

Bellows also points out considerations that must be given to nutrient distribution and cattle movement in pastures. Discussed are rotational grazing vs continuous grazing, manure distribution in pastures and manure nutrient availability. Density of forages is of course important, but diversity is key to maintaining optimum forage cover, use of photosynthesis and nutrient uptake, the publication explains.

A section on the “soil food web” explains how populations of soil

organisms such as earth worms and arthropods play a critical role in how nutrients are cycled in the soil.

A section on water quality takes a look at such topics as nutrient runoff, nutrient balances, nutrient loss pathways, pathogens in manure, nitrate and phosphorus contamination, impacts of contamination on water quality, riparian buffers, riparian grazing, soil erosion and drainage

systems. A chart depicts pasture management practices to protect water quality.

Organism network

These organisms are part of a dynamic network that decomposes organic materials and transforms nutrients. The publication explains the role of each of these organisms in the soil, and how varying populations of them are indicators of soil health.

Near the conclusion of *Nutrient Cycling in Pastures*, producers can rate their forage operations using a “Pasture Soil Health Card.” Various indicators such as “pasture cover” and “soil aggregation” are rated as good, medium or poor on the card.



Discretionary Programs

Programs	FY01	FY02 Bush	House FY02	Senate FY02	Final FY02
ATTRA	2.0	2.0	2.5	2.0	2.5
cons ops	714.1	773.5	782.8	806.5	779
DFO	128.0	128.0	128.0	147.0	147
DOL	525.0	600.0	00.0	611.0	611.2
FMNP	20.0	20.0	25/15	25/0	25/15
FSMIP	1.3	1.3	1.3	1.3	1.3
gfo	870.0	1000.0	100.0	100.0	100.0
gol-s	369.9	500.0	500.0	506.0	505.5
gol-u	1077.8	1500.0	1500.0	1500.0	1500.0
IES	0.8	0.0	0.0	1.3	1.25
nri	106.0	106.0	106.9	137.0	120.5
OFPA	1.6	1.6	?	?	?
org trans	0.5	0.5	2.0	1.0	1.5
RBEG	40.6	40.6	42.6	46.6	46
rbog	8.0	3.0	4.0	3.0	?
rc&d	42.0	43.0	48.0	48.0	48.0
RCDG	4.5	4.5	5.0	6.0	5.25
SA-PDP	3.8	3.8	5.0	4.5	4.75
SARE	9.3	9.3	12.0	13.0	12.5
SDA	3.0	3.0	3.0	3.5	3.243
SMG	3.0	3.0	3.0	4.0	3.49

Mandatory Programs

Programs	FY01	FY02 Bush	House FY02	Senate FY02	Final FY02
CFO/CSP	0.0	0.0	0.0	0.0	0.0
CFSA	2.5	2.5	2.5	2.5	2.5
EQUIP	200.0	174.0	200.0	200.0	187
FPP	7.5	0.0	0.0	0.0	0.0
FRA	30.0	30.0	0.0	0.0	0.0
IFAFS	120.0	120.0	0.0	120.0	0.0
whip	12.5	0.0	0.0	0.0	0.0
WRP	161.0	0.0	0.0	0.0	0.0

FY2002 Funding

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were important conservation programs that were zero-budgeted. The Environmental Quality Incentives Program lost \$13 million to other conservation categories.

The Initiative for Future Agricultural And Food Systems (IFAFS) is a major \$120 million research program whose grants have included a moderate number for sustainable agriculture work. Its funding was also cut.

Overall, we enjoyed excellent progress on some smaller, key programs like SARE and ATTRA, but suffered major losses in conservation and IFAFS.

ATTRA – Appropriate Technology Transfer for Rural Areas
 CFO/CSP – Conservation Farm Option
 CFSA – Community Food Security Act (CSREES)
 cons ops – Conservation Operations (Technical Assistance) (NRCS)
 DFO – Direct Farm Ownership Loans (FSA)
 DOL – Direct Farm Operating Loans (FSA)
 EQUIP – Environmental Quality Incentives program (NRCS)
 FPP – Farmland Protection Program (NRCS)
 FMNP – Farmers Market Nutrition Program (part of WIC program)
 FRA – Fund for Rural America (RD/(CSREES/Secretary)
 FSMIP – Federal-State Market Improvement Program (AMS)
 gfo – Guaranteed Farm Ownership Loans (FSA)
 gol-s – Guaranteed Farm Operating Loans – Subsidized (FSA)
 gol-u – Guaranteed Farm Operating Loans – Unsubsidized (FSA)
 IFAFS – Initiative for Future Agriculture & Food Systems (CSREES)
 IFS – Integrated Farming Systems partnerships (ARS)
 nri – National Research Initiative (CSREES)

OFPA – Organic Foods Production Act (AMS)
 org trans – Organic Transition Program (CSREES)
 RBEG – Rural Business Enterprise Grants (RBCBS)
 rbog – Rural Business Opportunity Grants (RBCBS)
 rc&d – Resource Conservation & Development (NRCS)
 RCDG – Rural Cooperative Development Grants (RBCBS)
 SA - PDP – USDA Professional Development Program
 SARE – Sustainable Agriculture Research & Education (CSREES)
 SDA – Outreach & Technical Assistance for Socially Disadvantaged Farmers
 SMG – State Mediation Grants (FSA)
 whip – Wildlife Habitat Incentive Program (NRCS)
 WRP – Wetlands Reserve Program (NRCS)

Charts courtesy of Ferd Hoefner and Martha Noble of the Sustainable Agriculture Coalition.

Through rain & shine, NCAT ag specialist spreads the ATTRA word amidst CA ag wonders

Imagine a place where on one short stretch of road you pass fields of rice, wheat, corn and alfalfa. Could be any one of a dozen southern states, right? Add some orange groves to that mix and you could be in Texas, Florida, Arizona and a couple others. Then add orchards of olives, almonds and figs, and you could only be in California, home to the largest and most diverse agriculture in the country and, arguably, the world. Those are also some of the reasons that the National Center for Appropriate Technology (NCAT) recently opened an office in California with a focus on ATTRA work.

By Rex Dufour
NCAT Agriculture Specialist

I've worked for NCAT for nearly eight years and been stationed for almost six months now in our new California office at Davis. It is not quite halfway down the Central Valley, moving north to south. In the manner of some roads that change names without giving you any notice, the northern section of the Central Valley is called the Sacramento Valley and fades imperceptibly (to me, anyway) into the San Joaquin Valley somewhere south of Sacramento and north of Fresno. But it's all the Central Valley, and if you owned some of the Class 1 land here, you could take your pick on planting any one of perhaps 150 different crops. You couldn't plant dates—they only grow way down south around Palm Springs. The variety makes agriculture here exceptionally interesting, which makes my job interesting too.

Gathering crop info

Part of my work is to gather information about some of these crops—how they're grown sustainably or organically—and add that to the broad portfolio of information that NCAT's ATTRA project makes available, free of charge, to folks like yourselves.

For example, I was recently assigned a question from an ATTRA caller who requested information about organic almond production. California grows pretty much all the almonds that are eaten in this country, so chances were good that any organic almond grower would be here as well. After talking with a few folks, I got the name of an organic almond grower/processor, Chris, who then was very helpful in providing the information needed by the ATTRA caller. His operation sounded so interesting, I arranged a site visit.

Almond processing plant

Turns out he runs the only all-organic almond processing plant in CA (and quite possibly the world...) and instead of machine-harvesting the almonds (a very noisy and dusty process that calls for a very smooth, "clean" plant-free orchard floor), he harvests by hand, using the same crew of five for the last 14 years or so along with a team of beautiful Percherons (he has nine)—good tempered, well muscled draft horses. He's put pen to paper and has concluded that using horses is at least as economical as machine harvest and allows him better biological management of the orchard floor, which keeps his pests down and soil quality up. This is not a backyard operation, either—he has 120 acres in organic almonds.

A major part of my work is alerting growers in CA that the ATTRA service exists and can help provide them with information about production and marketing options. With the National Organic Standards due to come on-line in October 2002, the ATTRA service will be in more demand than ever. So I go to farmer meetings whenever I'm able in order to "spread the word."

Most of the time I go to gather technical information, like at the soils workshop in Santa Cruz with Elaine Ingham several weeks ago. Elaine was pleased to let me speak a few minutes to a



Rex Dufour

Visitors (far right) gather informational materials from the ATTRA display at Rana Creek in the Carmel Valley during a workshop that Rex attended on ways to increase biodiversity on the farm.



group of 80 or so about NCAT's ATTRA project. She told me she feels that it's important for people to know about the ATTRA service. From the way the 30 copies of ATTRA's *Sustainable Soil Management* that I brought along disappeared, I'd have to agree.

Occasionally, I'm asked to present to a group. I share office space with another non-profit doing good work, the Community Alliance with Family Farmers (CAFF). One of the CAFF staff asked if I would talk at an on-farm (walnut orchard) meeting organized around planting hedgerows to enhance biodiversity. It's one of my favorite topics...really!

Of course it rained, but over 20 farmers still turned out. The walnut farmer spoke first. He'd put in a simple four-species hedgerow many years ago to attract beneficials. The secret is to have some kind of pollen or nectar source available all year long for the good bugs, which should be viewed just like miniature livestock from a management perspective. Although he's not organic, he hasn't sprayed insecticides in 14 years in spite of the fact that walnuts in California have problems with walnut husk fly, navel orangeworm and codling moth, not to mention occasional mites. The hedgerows are all native perennials, so that after the first two to three years of irrigation, they do well without any care.

Complementing Extension

Rachael Long then spoke. Rachael is a county extension agent who is doing very innovative research on plant preferences of beneficials and pests in a farmscaping context (if you want to know more about farmscaping, call ATTRA). She views ATTRA as an information dissemination partner—helping to get the information she develops out to a wider audience.

Looking for partnerships—that's the third component of my work. Seeking partners with strengths that complement those of NCAT's ATTRA project is something our staff in Fayetteville and Montana are constantly pursuing. It's particularly exciting in California because there are so many possibilities for creative partnerships. Stay tuned....



GM Crops

crops and discusses related public issues. The publication is intended for farmers who are currently growing or thinking of planting transgenic crops, farmers with fields near transgenic cropland, people working in markets and fields impacted by transgenic crop production, and general audiences.

As Matheson explains, the publication doesn't attempt to provide "definitive answers or recommendations" about the genetic engineering issue, because so many scientific and socioeconomic questions about transgenic crops are yet unanswered. Scientists are discovering, she says, that "how well transgenic technology works for farmers depends on the characteristics of each specific crop variety, the system in which it is placed, the skill with which it is managed, and the markets for which it is destined."

Creating GMOs

The new publication focuses on crop varieties created through a type of biotechnology commonly known as recombinant DNA, genetic engineering (GE), transgenic modification or genetic modification (GM). The products of genetic engineering are often called genetically modified organisms, or GMOs.

Included in the publication are explanations of how gene transfer is accomplished, a description of commercial transgenic crops and their traits, and a discussion that includes quotes and references from many experts on the unresolved issues of genetic engineering. The marketing, profitability, yield potential and liability of growing transgenic crops are also considered. Matheson offers some recommendations for other publications and websites for readers who want to further delve into the issue.

Four appendices from researchers in the field complement the information packet. These are: GMO Issues Facing Indiana Farmers in 2001 by Bob Nielsen of Purdue University; Wheat Industry is Cautious on Biotech Introduction

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by Bill Hord of World Herald via Agribiz.com; On the Implications of the Percy Schmeiser Decision by Dr. E. Ann Clark of the University of Guelph, Ontario; and Agricultural Biotechnology: Critical Issues and Recommended Responses from the Land-Grant Universities by Mississippi State University.

"While increased yields and improved nutritional value are among the promised benefits of transgenic crops, most genetically-engineered crops now planted worldwide are designed either to survive exposure to certain herbicides or kill certain insect pests," Matheson says.

GE farmer test

Until much more is known about advantages or detrimental impacts of transgenic crops, farmers will have to make decisions based on limited scientific data and the rhetoric of the two camps which are fiercely opposed on the issue. However, farmers faced with making a decision on growing transgenic crops may find helpful a 13-question "test" - or framework - which Matheson offers in the packet.

The framework poses such questions as: "Does the technology increase genetic diversity?," "Does it protect natural habitats?," "Does it increase farmers' market control? Management flexibility? Time?" and "Does it protect the public's access to information and improve public trust in agriculture?"

"Farmers and ranchers can ask themselves these questions in the context of their own operations to help determine whether adoption of the technology will move them away from or toward increased sustainability," Matheson says.

To obtain a free copy of *Genetic Engineering of Crop Plants: What Farmers Need to Know about Transgenic Crops*, call ATTRA from 8 a.m. to 5 p.m. (Central Time) Monday through Friday at 800-346-9140 or visit our website at www.attra.ncat.org.



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ATTRAnews

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December, 2001

ATTRAnews, a quarterly publication of Appropriate Technology Transfer for Rural Areas, is mailed free of charge to ATTRA friends and users. ATTRA disseminates information about sustainable agriculture to U.S. farmers, agribusiness, Extension agents and other interested people. ATTRA is funded through the Rural Business-Cooperative Service, U.S. Department of Agriculture and is administered by the National Center for Appropriate Technology (NCAT), a nonprofit organization that since 1976 has worked to champion sustainable technologies and community based approaches that protect natural resources and assist people, especially the economically disadvantaged, in becoming self reliant.



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