

CORNELL

ALS NEWS

Agriculture & Life Sciences

A Magazine for Alumni and Friends of the College of Agriculture and Life Sciences at Cornell University

Taking TV Weather by Storm

Mish Michaels '90
follows funnel clouds,
hurricanes, and
cyclones.

Autumn 2003



Prowler of Earth and Sky

Cornell's Grape Team

Message in a Bottle

Susan A. Henry, Ph.D.
*The Ronald P. Lynch
Dean of Agriculture
and Life Sciences, Cornell
University*



ALS NEWS

The faculty and administration of the College of Agriculture and Life Sciences at Cornell University recognize that there is a public dialogue on agricultural biotechnology. The development of this publication is part of our continued commitment to educate the public and facilitate informed public discussion of the issues surrounding agricultural biotechnology.

Anytime a publication is published on a controversial issue, legitimate questions may arise. I would like to be clear on our College's position and provide answers to some of the most commonly asked questions.

Costs for producing this publication came from discretionary funds of the Dean of the College of Agriculture and Life Sciences (CALS) at Cornell University. It was not funded by private sector or government funds.

Cornell University does not have a position for or against any technology. The faculty, students and staff believe it is important to explore various technical and social issues affecting agriculture, the environment, and human health. Such investigations apply to agricultural biotechnology as well as other technologies.

For 2000-2001, the College of Agriculture and Life Sciences had a budget of \$183,974,800 dedicated to teaching, research and outreach. Of that total, less than 25% was devoted to research in the social and biological sciences: \$42.8 million. Private companies supplied about 5.4% of the research budget, or about \$2.3 million. The main sponsors of research were federal government agencies (U.S. Department of Agriculture, National Science Foundation, U.S. Department of Health and Human Services), New York State agencies and foundations. These research funds were used in diverse areas in the social and biological sciences, including biotechnology. All funding must be approved by the college and university administrators who enforce guidelines to ensure that information produced by research is not inappropriately restricted by corporate or other interests.

This research includes work on animals, food components, and plants. For example, researchers at Cornell University test biotechnology plants in the laboratory, greenhouse and field according to federal and state regulations, which may require regulatory permits and inspections. Cornell has a system to ensure compliance with these regulations, which can be seen at <http://oeh.cals.cornell.edu/transgen.html> under "Transgenic Procedures and Flow Chart."

Information about what biotech products are being tested and what permits have been issued is available through the U.S. Department of Agriculture's website and through other locations such as Virginia Tech's "Information Systems for Biotechnology"

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Changing Markets for Finger Lakes Grapes



Other plants that provide more “consumer-oriented” benefits are being developed—plants that stay fresh longer or provide health benefits

The plants and animal products we consume today are far different than those consumed by our ancestors, and even by our great grandparents. Beginning over 10,000 years ago our ancestors began to improve plants and animals through selective breeding for desired characteristics such as yield, color, or resistance to diseases and this process continues today. Nature provided our ancestors with the initial material for selective breeding of many different types of plants. We would not recognize many of these ancient plants today since, after the course of domestication

and selective breeding, they bear little resemblance to what we see in the grocery store. Plants and animals have evolved over time and taken on new characteristics, but they also retain most of the genes from their past heritage. In fact, as we learn more about the genetic makeup of plants we find tremendous similarity among all plant species. Even more remarkable is that recent studies in biology have revealed that plants share many of studies in biology have revealed that plants share many of their same genes with organisms as diverse as bacteria and humans.

While natural selection and selective breeding by humans have been the main methods of plant and animal improvement in the past, biotechnology offers new options. Since 1996 growers have used GE plants that resist attack by insects and disease-causing organisms or plants that allow new options for weed management. The rate of adoption of GE plants has arguably been faster than any other agricultural development in the last 50 years. From an initial planting of 4.3 million acres in 1996, these “pest management” GE crops are estimated to be grown on over 123 million acres in 2002.

Other plants that provide more “consumer-oriented” benefits are being developed—plants that stay fresh longer or provide health benefits such as increased protein content, lower fats or higher vitamin and mineral content, and plant that can deliver a safe and effective vaccine when they are eaten. GE carnations varieties that display blue-violet coloring are available from florists. Plants that produce biodegradable plastics and fuels are being developed as alternatives to petroleum.

Cornell releases 'L'Amour and 'Clancy' Strawberries

products, and animals are being developed that produce less manure or grow more quickly. Time will tell whether these products become commercialized and provide benefits to society.

The first food products of biotechnology appeared in the market in 1990: an enzyme used in cheese production and a yeast for baking. In the case of cheese, a GE enzyme replaced use of an enzyme derived from animals and was done to provide a safer and more reliable method of cheese

production. In 1994, a GE tomato with a longer shelf life was introduced into the market but it did not fare well because of production and distribution problems. Because of the widespread cultivation of GE grown for pest control, it is estimated that 60 to 70% of processed foods in the United States contain at least one ingredient from a GE plant—largely due to the widespread cultivation of GE corn and soybean which are ingredients for Agricultural biotechnology, like many other

technologies in the past, has been the subject of controversy. Prior to the introduction of pasteurization, milk was a major source of diseases and death in the American population. In a survey conducted in 1900, 28% of the infant mortality was estimated to be due to gastrointestinal diseases, largely caused by consumption of non-pasteurized milk. Adoption of milk pasteurization, a process using heat to reduce pathogenic microorganism, reduced infant mortality.



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Looking for Love in All the Right Places: Fruit odors lure some flies to evolve into new species, Geneva researchers say

The point where contaminated milk is no longer a major issue in the U.S. However, at the time pasteurization was an extremely controversial subject with claims that it was deceptive and affected food quality, the economics of production and was unnatural. Over time other technologies such as freezing food or using food colorings have been the subject of controversies.

New technologies, like biotechnology and pasteurization, are often the result of basic scientific discoveries and the subject of controversies, especially when they are introduced into the food system.

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For more information on foods derived through biotechnology, please see the section on Food.

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which are ingredients for many foods. For more information on foods derived through biotechnology, please see the section on Food, Food Safety and Human Health.

Agricultural biotechnology, like many other technologies in the past, has been the subject of controversy. Prior to

the introduction of pasteurization, milk was a major source of diseases and death in the American population. In a survey conducted in 1900, 28% of the infant mortality was estimated to be due to gastrointestinal diseases, largely caused by consumption of non-pasteurized milk.

Adoption of milk pasteurization, a process using heat.

Pathogenic microorganisms, quickly and dramatically reduced infant mortality to the point where contaminated milk is no longer a major issue in the U.S. However, at the time pasteurization was a controversial subject.

DIETING FACTS & FICTION:

- Medicines (e.g. diagnostic tools and drugs such as insulin)
- Plants (e.g. insect, disease, and herbicide resistant).

Communications Services Invests in New Technology for the Print Shop

To understand the term “biotechnology,” it is important to review a basic concept of biology—the gene. Genes are contained in all living cells. They not only provide instructions on cell function, but are passed from generation to generation to help a species survive. The wonders of all living things, from the smallest one-celled protozoan to the multi-billion-celled human, are manifested through their ability to use a similar genetic code of life. The fruits, vegetables and meat products we eat all contain genes and the proteins produced by genes.

The 19th century monk, Gregor Mendel, used pea plants to determine that genes in

plant pollen (the male part of a plant) and the plant pistil (the female part of the plant) pass certain characteristics from one generation to the next. Mendel’s ideas became the basis of our present understanding of heredity and genetics, and soon led to more fundamental studies on the nature of the gene. It was James Watson and Francis Crick in 1953 who proposed the structure of DNA (deoxyribonucleic acid) as the carrier of genes and later were awarded a Nobel Prize for their discovery. They described the structure of the DNA molecule as a complex three-dimensional double helix structure that resembles a ladder. The sides of the ladder alternate sugar and phosphate

molecules, and the rungs are nitrogenous bases between the sugar molecules. There are four different bases in DNA known as thymine (T), cytosine (C), adenine (A) and guanine (G). The sequence of bases differs from gene to gene and thus defines the gene. DNA is contained on chromosomes (humans have 23 pairs of chromosomes) and serves two functions: it contains the genetic material (genes) that controls heredity, and it produces RNA which directs the synthesis of proteins which make cells function.

But genes are not static; they change over time when required by the organism or by chance. They are also selected for by evolutionary processes.



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Taking TV Weather by Storm



Ever since a funnel cloud swooped down on her childhood home, Mishtu Mukherjee '90 has been intrigued by severe weather. Better known now as Mish Michaels, her TV career is a whirlwind in itself.

BY METTA WINTER

Mishtu Mukherjee's first childhood memory is captured in an old snapshot: a dark-haired little girl in a pink dress and white anklets is standing among the branches of a tree ripped out of the ground by a tornado. It was the day her big wheels vanished, too.

Five-year-old Mukherjee—known nationally to viewers of the Weather Channel's magazine show, *Atmospheres*, as Mish Michaels—had been in the tub that morning when her mother screamed to get out and run to the living room.

"I remember looking out the picture window and wondering why there was an ocean right outside when we had to drive to the beach," Mukherjee recalls. Minutes later the eye of the tornado lifted and was gone, leaving a landscape of fallen

trees and missing toys. Mukherjee and her parents quickly made their way to a nearby highway to help people out of overturned cars.

"Because nobody was hurt, it wasn't scary for me,"

Mukherjee recalls at having been submerged in the funnel of a tornado. "Rather it was more like, 'Let's do that again—it was amazing!'"

So began her love affair with extreme weather. Yet to a girl growing up in the 1980s in Saratoga Springs, New York, becoming a

weather forecaster just wasn't on the radar screen. By high school, Mukherjee had become avowedly weather obsessed—taking hourly snow measurements during winter storms, watching not one or two but three TV meteorologists every night before going to bed, and sitting in front of the window with a bowl of popcorn, eyes on the sky. But having never seen a broadcast meteorologist who looked like her, Mukherjee had settled for her other passion—horses—and had accepted early admission into the pre-vet program

in the College of Agriculture and Life Sciences.

Her epiphany came one August night as she shushed her talkative boyfriend so she could assess the time between flashes of lightning and the boom of thunder.

"While I was counting out the seconds to see how close the storm was, I suddenly shouted, "I know what I should be, I should be a meteorologist!"

It hasn't been a cake walk.

Mukherjee's name didn't make it past the first day of her first job as weekend meteorologist and environmental reporter for a New Hampshire television station. (She and her mother picked Michaels out of the phone book.)

Then there was being the only woman in the room at meetings. Mukherjee remembers clearly how

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The Big Green Screen

When Mishtu Mukherjee '90 was an undeclared at Cornell, she would go to the WIC-TV studios at Ithaca College—script and visuals in hand—to try, yet again, to get it right.

"Doing an on-air weather forecast is an incredible feat of coordination and I was just horrible at it," Mukherjee recalls of



her days as the weather reporter on NewsWatch 16. "It aggravated me so much because I worked so hard and tried so hard and still I was pathetic."

Mukherjee's early failures firmed her resolve to become an expert at on-air forecasting. Today, when you occasionally catch her on

camera, the 2-minute, 30-second story of what's going on in the nine-mile-deep layer of constantly moving air and moisture that surrounds us, appears effortless.

Just consider what she's doing.

First she's standing in front of a blank screen called a Chroma wall (Chroma Key technology that marries two images was invented in 1950s Hollywood to save costly location shoots), watching herself in three monitors. Because the images are projected via mirrors, Mukherjee sees herself in reverse.

With no script as a guide, she simultaneously moves back and forth, pointing to various spots in mid-air, clicks a button to change each graphic (she had created them an hour before), and talks off the cuff. All the while, the floor manager's voice in her ear counts off the elapsed seconds (or the seconds left?).

After 17 years, Mukherjee, a three-time nominee for a New England Emmy, still doesn't cut herself a break.

"When I'm on the air I want it to be a stellar presentation that's fascinating and engaging and really takes people on an interesting journey through the atmosphere," she says. "I want it to be a masterpiece of information."

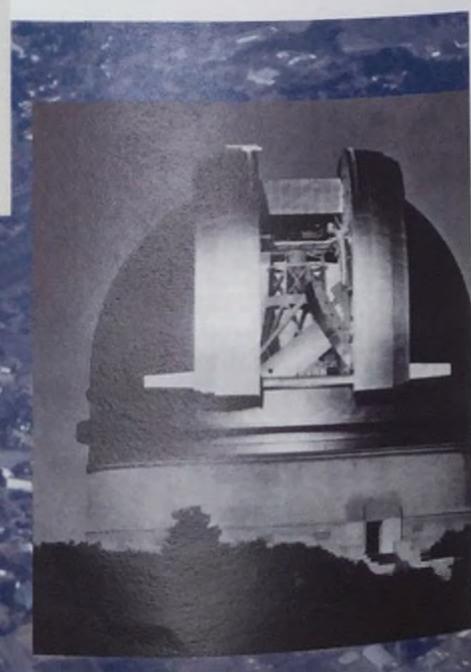




chance to travel the world learning science hands-on: optimum weather for ice climbing in Alberta, _____ mph winds while surfing in Aruba, ozone depletion during a hiking expedition in the Swiss Alps, _____ while walking in a Hawaiian volcano. (Mish please fill in the blanks appropriately.) (You can catch the reruns on Saturday and Sunday nights.)

After more than a decade on the air, Mukherjee has broadened her scope as a strategist for the CBS-affiliate WBZ Channel Four Weather Team in Boston. (Boston is a meteorologists' mecca, sporting the country's oldest weather observatory at the American Meteorological Society's headquarters.) Although she still goes into the field to provide in-depth analysis of weather events and produces half-hour specials for the CBS prime-time weather show *Eye on Our Atmosphere*, most of Mukherjee's efforts center on developing a vision for the weather department's overall direction, particularly research and service to the community.

"I want to capitalize on our position as a public server, leverage the exposure we can bring to inspire and educate the public in new ways,"



"We live inside an atmosphere that is 10 kilometers thick and is in constant motion. That we can model that fluid and anticipate its changes with the accuracy that we do is really astonishing."

Boston is a meteorologists' mecca, sporting the country's oldest weather observatory at the American Meteorological Society's headquarters.

her heart would pound and her palms would sweat when she raised her hand at professional conferences.

"An entire room full of men—150 or more—would turn around and stare at me," she recalls of the early 1990s. "They couldn't believe they were hearing a woman talk."

Mukherjee's hand kept going up because of her confidence in the grounding in science she received at Cornell.

"I could walk the walk because I had outstanding academic credentials, had worked hard, and knew I was doing the right thing—building a career I'd be proud of," she says.

Since those early anxious days it's been, she says, "a wonderful evolution."

There were _____ years with the Weather Channel as a _____, then later as host of *Atmospheres*—a "very cool job" that gave her the

says Mukherjee, who is always keen to share her love of the science behind weather.

The station's annual weather almanac, cloud chart, and conferences held in conjunction with Boston's Museum of Science are becoming staple fare for the city's weather-proud citizens. Mukherjee conducts research as an adjunct faculty member in the Meteorology Department at the University of Massachusetts in Lowell and, last fall, put together a weather observer conference to train citizen volunteers who feed data to the station's web site for immediate on-air broadcast during severe conditions. It gives her a chance to work with volunteers who are, Mukherjee says, the "cornerstone of our climate records."

And she volunteers herself. Mukherjee had a long-time association with the Big Sister Association of Boston as well as other organizations that serve girls and women in crisis. Since graduation she's also mentored Cornell meteorology undergrads and recent graduates. With only a 10.6 percent representation of women in the field of meteorology (12.6 percent women in broadcasting), Mukherjee wants young women to know the score, while getting the support they need.

"As a woman, you have to run harder than your male counterparts just to be noticed," Mukherjee says, adding that she's had to prove herself over and over again. Nevertheless, the field is opening up (the science and technology pipeline is now 25 percent women), and professionals like Mukherjee want to be visible to those coming along.

"I want young women to seize new opportunities, knowing that there are experienced women behind them, that we're here to answer their questions so they never have to feel intimidated, never feel like they're the odd person out."

"Broadcast meteorologists get hammered by the public for a science which is riddled with uncertainties. The majority of forecasters work hard to help people make better decisions for themselves."



Misha had the chance to travel the world learning science hands-on: optimum weather for ice climbing in Alberta, surfing in Aruba, hiking expedition in the Swiss Alps, and walking in a Hawaiian volcano.

Prowler of Earth and Sky

David Wolfe explores the secrets of the subterranean world and probes the profound questions posed by global warming.

BY JAY WROLSTAD



David Wolfe explores the secrets of the subterranean world and probes the profound questions posed by global warning. The T-DNA can also be used to transfer genes.

The “Gene Gun” is a popular tool used world-wide for genetically engineering plant cells. Researchers at Cornell’s Geneva and Ithaca campuses developed the technology in 1986. It “shoots” DNA at high speed so that it becomes incorporated into the plants genome. Gene transfer by the common soil-dwelling bacterium, *Agrobacterium tumefaciens*, is another powerful tool routinely used for plant genetic engineering. This bacterium naturally transfers its genetic material

into other plants. Scientists add new genetic material to this bacterium so that it “piggybacks” in the transfer. Both techniques require an additional step of “tissue culture. In this process the newly transformed plant material is selected to make sure it has the useful genes in it.

It would be great if we had a picture of Mary-Dell Chilton, who is a member of the National Academy of Sciences, but I can’t seem to locate it on the web. If we had one it could have this note. Mary-Dell Chilton

proved that the crown-gall tumors of plants are caused by the transfer of a small piece of DNA from a plasmid in the pathogen, *Agrobacterium tumefaciens*, into the host plant, where it becomes part of its genome. The T-DNA can furthermore be used to transfer genes between prokaryotic and eucaryotic organisms. Chilton’s work has thus been essential in transforming genetic engineering of plants from science fiction to science.

Whether a plant has been

developed through traditional breeding or genetic engineering it is still a plant, and it is important to assess the potential risk of introducing new characteristics in to the plant. Plants naturally contain thousands of chemicals that are also used not only to help them develop, but to protect them from being eaten by pests. For both GE and traditionally bred foods, it is important to understand food safety issues.

Most people can eat the plants commonly found in stores in the United States without any problem, but some people can't because of food allergies. According to the American Academy of Allergy, Asthma and Immunology (AAAAI) (<http://www.aaaai.org>), a food allergy occurs when a person's immune system overreacts to an ordinarily harmless food. According to AAAAI, an estimated 1-2 percent of adults and 2-4 percent of children have some allergic reaction to some food products. The most common food allergens (the parts of the food that cause allergic reactions) are proteins from cow's milk, eggs, peanuts, wheat, soy, fish, shellfish and tree nuts. Allergic reactions vary between individuals and may be mild to severe. An allergic reaction to a food (as well as to pollen and dust) is due to a chemical in the blood (IgE) recognizing an allergen, and causing the overreaction in th



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Plants contain what are often termed “secondary plant compounds” (chemicals which are not required for normal plant growth and development) which may protect them from insects and diseases but may cause toxic reactions in humans if present in high concentrations.

Prior to the introduction of a new plant variety, whether bred through traditional or biotechnology methods, it is important to screen it for known allergens or toxins. In traditional breeding there have been cases of new breeds of potatoes, celery and cucumbers which had elevated levels of allergens or toxins. These varieties have been identified through screening and are not in the market. In the case of GE plants, whenever a new gene is introduced into the plant, it is also evaluated for the production of potential allergens and toxins. (See section on Who Regulates the Technology). In March 2002, the American Society of Toxicology (<http://www.toxicology.org>) stated its view on the safety of foods produced through biotechnology, “There is no

reason to suppose that the process of food production through biotechnology leads to risks of a different nature than those already familiar to toxicologists or that cannot also be created by conventional breeding practices...”

While food allergies and toxins may cause immediate health risks, nutritional disorders generally cause health problems over a longer term. A healthy diet is a balanced diet. Information on proper nutrition and diet can be obtained through the American Dietetic Association (<http://www.eatright.org/>).

When new varieties of plants are produced through traditional breeding, there are no long-term studies undertaken to determine potential nutritional disorders. Traditional breeders have operated under the guidelines that no long-term studies are required for the new plant variety if they do not alter the composition of essential nutrients (e.g. vitamins) or introduce any potential allergens. GE plants fall under these same guidelines. From a regulatory standpoint, GE plants on

the market are considered to be “substantially equivalent” to their non-GE counterparts. Although not required of products from traditional breeding techniques, many studies have been conducted using plants derived from biotechnology fed to livestock and poultry. According to the Federation of Animal Science Societies, there is no effect of feeding biotechnology crops to livestock and poultry (<http://www.fass.org/>).

Because of the importance of having a safe food system, many scientific societies have published helpful information on foods and food safety aspects of crops derived from biotechnology. Besides those listed above, you may wish to examine the references at the end of this publication.

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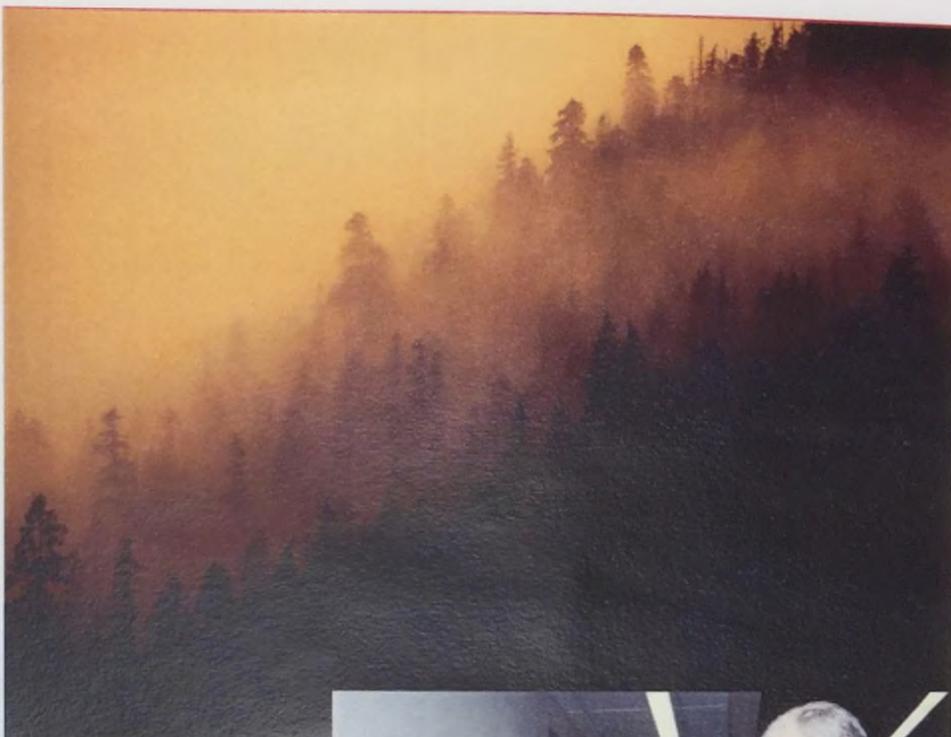


For more information on the standards and testing procedures for evaluating GE foods, you may wish to refer to the Institute of Food Technologists <http://www.ift.org/govtrelations/biotech/biotechnology.shtml>.

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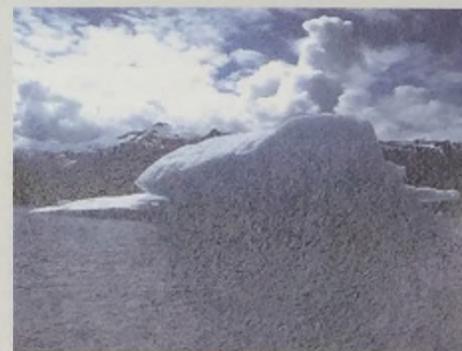
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When new varieties of plants are produced through traditional breeding, there are no long-term studies undertaken to determine potential nutritional disorders. Traditional breeders have operated under the guidelines that no long-term studies are required for the new plant variety if they do not alter the composition of essential nutrients (e.g. vitamins) or introduce any potential allergens. GE plants fall under these same guidelines. From a regulatory standpoint, GE plants on the market are considered to be "substantially equivalent" to their non-GE counterparts. Although not required of products from traditional breeding techniques, many studies have been conducted using plants derived from biotechnology fed to livestock and poultry. According to the Federation of Animal Science Societies, there is no effect of feeding biotechnology crops to livestock and poultry (<http://www.fass.org/>).

Because of the importance of having a safe food system, many scientific societies have published helpful information on foods and food safety aspects of crops derived from biotechnology. Besides those listed above, you may wish to examine the references at the end of this publication.

For more information on the standards and testing procedures for evaluating GE foods, you may wish to refer to the Institute of Food Technologists <http://www.ift.org/govrelations/biotech/biotechnology.shtml>.

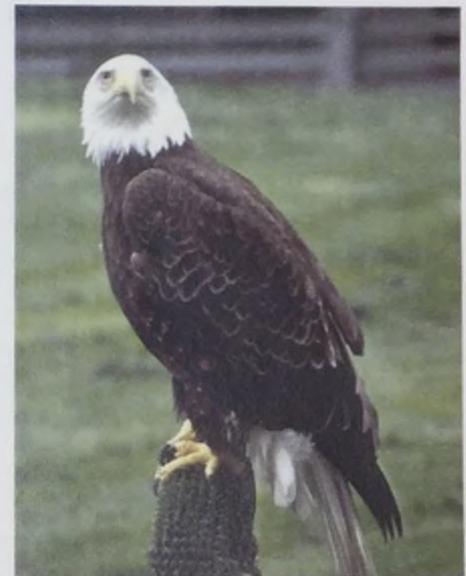
Prior to the introduction of a new plant variety, whether bred through traditional or biotechnology methods, it is important to screen it for known allergens or toxins. In traditional breeding there have been cases of new breeds of potatoes, celery and cucumbers which had elevated levels of allergens or toxins. These varieties have been identified



through screening and are not in the market. In the case of GE plants, whenever a new gene is introduced into the plant, it is also evaluated for the production of potential allergens and toxins. (See section on Who Regulates the Technology). In March 2002, the American Society of Toxicology (<http://www.toxicology.org>) stated its view on the safety of foods produced through biotechnology, "There is no reason to suppose that the process of food production through biotechnology leads to risks of a different nature than those already familiar to toxicologists or that cannot also be created by conventional breeding practices..."

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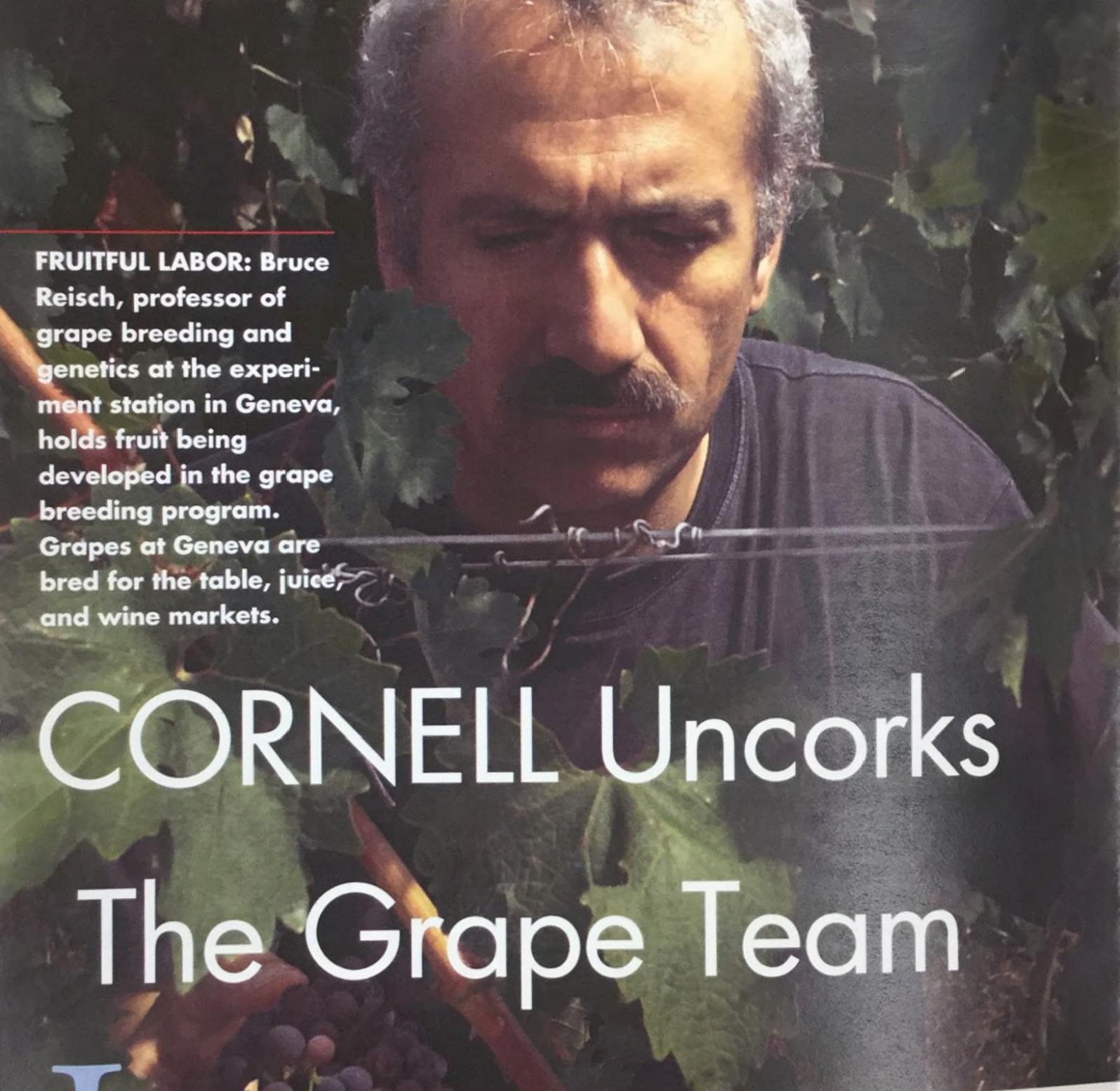
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FRUITFUL LABOR: Bruce Reisch, professor of grape breeding and genetics at the experiment station in Geneva, holds fruit being developed in the grape breeding program. Grapes at Geneva are bred for the table, juice, and wine markets.

CORNELL Uncorks The Grape Team

In the major leagues of vines and wines, New York State plays with the big boys. The Empire State has over 31,000 acres of grapes under cultivation, ranks second behind California in wine production, and dominates the nation's grape juice industry

The number of wineries has jumped from 19 to 160 since 1976, and winemakers on Long Island, in the Hudson Valley, in the Finger Lakes,

and along Lake Erie are winning international wine competitions and gaining market share.

Wines from New York satisfy

the spectrum of consumer taste, from the sweet dessert wines to the dry table wines to the bubbly; while quality Rieslings, Chardonnays, ment

Message in a Bottle



New York's wine makers and brewers now have a commercial-sized laboratory to evaluate their vintages, test their equipment, and try out new techniques.

Peter Saltonstall, owner of the King Ferry Winery, had a batch of Cabernet Franc that just wasn't what he wanted it to be. It was a decent wine, but I wanted to improve it.

"It was a decent wine, but I wanted to improve it by toning down one of the flavors," says Saltonstall, who has been making wine in the Finger Lakes for 12 years.

So he sent a sample to Ben Gavitt, supervisor of the Cornell Wine Analytical Lab at the New York State Agricultural Experiment Station in Geneva, who suggested heat treatment might do the trick.

As Gavitt explains it, red wines get better with age; the heat of pasteurization can accelerate this process by flash-heating the wine, which subdues some of the more predominant and less desirable

flavors. But it's a delicate thing—you only want to tame certain flavors without destroying others. Several different temperatures and different

New York's wine makers and brewers now have a commercial-sized laboratory to evaluate their vintages, test their equipment, and try out new techniques.

lengths of time were evaluated. A test panel subsequently preferred one particular treatment that resulted in improved aroma and mouth feel. So much so, in fact, that Saltonstall sold the 1,000 gallons for \$23 a bottle rather than the \$10 or so the original would have brought.

"Wine making is an art and a science, I really think about half and half," Gavitt says. "you have to know your science but to make exceptional wines you have to tweak it, and therein lies the artistry, and also the chance for error."

For 13 years the Wine Analytical



World Food Prize Laureate Wilson Pickett.

World Food Prize Laureate to Speak at Station

Anyone who has grown a garden knows the importance of weed management. Weeds reduce the yield and quality of plants and may also contaminate the product, so most large scale growers use herbicides. Worldwide, it is estimated that nearly \$14 billion of herbicides are used annually. Depending on the crop, herbicides may be applied prior to planting the crop in order to reduce germination of weeds. Additional selective herbicides may be applied once the crop has germinated in order to kill weeds that escaped the first application. Although herbicides kill weeds and are virtually non-toxic to humans, there is a need to reduce their impact on the environment. One way is to use an herbicide that is less persistent in the

environment but still provides good weed control. The rationale for GE herbicide-resistant crops is that they have been developed to be resistant to a common herbicide so that they can be planted directly into the field, allowed to germinate with any weeds already present, and then be treated with an herbicide that kills only the weeds. The common herbicide that the crop is resistant to is called glyphosate (Roundup) and it is considered to be a far safer herbicide than most other herbicides from an environmental standpoint because it degrades more quickly and there is less risk of it contaminating ground water. The gene for resistance to glyphosate was derived from the petunia plant. Use of herbicide resistant crops has proven to reduce soil

erosion and compaction because growers drive over the field fewer times and can now use minimal tillage practices more easily. Recent data indicate that use of these plants also results in a substantial reduction of herbicides. However, as with any herbicide, there is also concern that some weeds may become resistant to glyphosate. Insects can damage plants and affect human health and an estimated \$8 billion is used annually for their control. In agriculture an estimated 30% of this market can be substituted by insect-protected plants with produce a protein from a bacterium, *Bacillus thuringiensis* (Bt).

Caterpillars, the immature stages of moths, bore into the stalks and ears of corn or feed on the flowers and buds of cotton plants.



Geneva plant pathologists play Charlotte.

Pathologists Play Charlotte

Plant pathologists have not been able to breed high levels of caterpillar resistance into corn or cotton by traditional methods, so the primary method of control has been the use of insecticide

sprays. But, with genetic engineering techniques, breeders have been able to insert a gene from *Bacillus thuringiensis* into cotton and corn to produce a protein that protects the plant against attack by

insects. This protein has been used by farmers—both organic and conventional—as a spray for over 50 years and is harmless to humans and many natural enemies. However, it is frequently

Sear-Browen Hired for New Vineyard Lab Project in Fredonia

Lab projects are marginally effective when applied as a spray because it may not get to where the insect is feeding and breaks down quickly.

Since its introduction in the US in 1995, the use of Bt corn and cotton plants has increased dramatically. Cotton accounts for 30% of the total agricultural insecticide use and in 1999 it was estimated by the National Center for Food

and Agricultural Policy that use of Bt cotton resulted in a reduction of 1,200 metric tons of active ingredient of insecticide. Most of the alternative insecticides have a wider spectrum of activity than Bt and are therefore of more concern to non-target organisms like beneficial insects. However, a primary concern about widespread use of Bt plants is that insects could become

resistant to them. Although there are no cases of insects becoming resistant to Bt plants, there are instances of insects becoming resistant to sprays of Bt. This provides evidence of the importance of having a proactive resistance management program for Bt plants. The Environmental Protection Agency (EPA) mandates a resistance management program for use of Bt plants.



Sear-Browen Group, l-r: Joe Ogrodnick, Gemma Osborne, Rob Way and Matt Lewis.

Shannon Olsson Named CSIP Fellow

CSIP relies on the use of biological and cultural control practices, as well pest-resistant plants, to manage pest populations. This is an overall Integrated Pest Management (IPM) strategy. Traditional breeding has provided resistance to some diseases, but not others, so agriculture still relies on use of \$5.8 billion annually for control of fungal diseases. Breeding for resistance to fungi and other microorganisms through traditional methods requires crossing closely related species, one of which has a gene. Another approach using biotechnology involves



Shannon Olsson

taking a part of the disease-causing organism and inserting it so that the plant becomes protected. Only squash and Hawaiian papaya have been engineered to be resistant. It is important that these plants be used.

New PGRU Research Leader Arrives

When cows are treated with a synthetic version of a naturally occurring hormone, it allows cows to produce milk more efficiently from the food they consume. This results in reduced animal waste and less environmental impact. Similarly, if crops are engineered to produce higher amounts of tissue (solids), there will be less waste during processing. This has been achieved with tomatoes grown for sauces. This results in reduced animal waste and less environmental impact and a happier PGUR unit in Geneva.



New PGRU research leader Chuck Simmons.

1920s/1930s



Harvey I. Scudder '39 of Dublin, Calif., is still active in biological and health sciences. He has a paper on insect integumentary glands ready for the press.

Philip I. Higley, Sr. '26 of Fort Walton Beach, Fla., celebrated his 100th Birthday on June 18, 2003 with over 200 family and friends. Among the Cornell greetings read at the celebration was a letter from then President Hunter Rawlings III. Also in attendance was "little brother" Ralph L. Higley '30 of Apopka, Fla. who is 96 years young.

Harvey I. Scudder '39 of Dublin, Calif., is still active in biological and health sciences. He has a paper on insect integumentary glands ready for the press and others on insect sensory organs in preparation.

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1940s



William M. Seymour Jr. '48 of Hillsdale, N.Y., is retired. He and his wife are active in the Grange and their local church. They continue to travel to Colorado to visit family and garden and keep honeybees as a hobby. They spend the winters in Myrtle Beach, South Carolina.

Alvin Silvey '49 of Boynton Beach, Fla., is retired and enjoying living in Florida.

Edwin (Ed) L. Slusarczyk '49 of Remsen, N.Y., was recently inducted into the Farm Broadcasters Hall of Fame at the annual meeting of the National Association of Farm Broadcasters. He began the Ag Radio Network in 1976 with 11 stations and now grown to 136 stations with reports heard all over New York, New England, Pennsylvania, Maryland

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1950s



M. Paul Friedberg '53 of New York, N.Y., is a landscape architect. He was awarded the second annual James Daniel Bybee Prize by the Building Stone Institute. This award honors an individual architect for a body of work executed over time and distinguished by outstanding design. His designs include Battery Park, NYC; Transpotomac, Washington, D.C.; Queens Square, Japan; Olympic Plaza, Calgary, Alberta, Canada; and Andromeda Houses, Israel.

Justin H. Kramer '53 of Silver Spring, Md.,

is retired and living in Montgomery County, Maryland.

Paul R. Seymour '55 of West New York, N.J., is a retired vice president of Merrill Lynch. He has four children and six grandchildren. He is the president of Care For the Homeless in New York City and president of the board of directors of a 430-unit residential complex.

Ralph E. Lamar III '58 of Port Jervis, N.Y., is a Minister. He was also a 4-H Leader for 35 years.

1960s



Ruth B. Hanessian '60 of Rockville, Md., is the president of the Maryland Association of Pet Industries. As president, she works to encourage statewide stores to engage in responsible behavior. Their gold circle membership insures any store will either accept or refer to an appropriate location any unwanted pet. The MAPI organization is also joining forces with the Maryland Invasive Species Council.

Andrew A. Duymovic '62 of Bethesda, Md., is retired from his position as foreign agricultural affairs officer in the U.S. Department of Agriculture. He is currently an adjunct professor of economics at Shenandoah University.

Dirk van Loon '62 of Liverpool, Nova Scotia, is the publisher and editor of DvL Publishing Inc. He has recently launched a new quarterly magazine called, "Pets Atlantic," which includes stories companion animals for all stripes."

Edward R. Hoerning '63 of Gastonia, N.C., is a laboratory manager at USDA, AMS, Science and Technology Laboratory.

Neil I. Tamber '64 of Trumbull, Conn., is the

associate director of market pharmaceutical company. He and his wife, Susan, will be celebrating is 38th anniversary. They have two children: David and Sarah, and four grandsons.

Donald M. Tobey '64 of Hyde Park, Vt., is retired from his college faculty position but still teaches economics part time. He and his wife, Kate, breed and show registered Morgan horses. He is also a horse show judge.

Arline Sroka Sumner '65 of Altamont, N.Y., has been a chemist/toxicologist with the NYS Department of Environmental Conservation for sixteen years. She is a member of the ALS Alumni Career Link and communicates with CALS students regularly. She also sings with the Masterworks He

and his wife, Susan, Chorus of Morristown, N.J. Sumner is a grandmother to Matthew (14) and Megan (12) – children of son, Joel, (Eng.) '93.

Phyllis W. Barlow '67 of Groton, N.Y., is legally blind, which affects her participation in many things. However, she still likes to keep in touch with ALS alumni.

Douglas C. Ferguson '68 of Silver Spring, Md., passed away on November 4, 2002.

Liz, typically we don't record deaths – but his widow renewed "his" membership for herself for two more years and indicated that he had passed away. Either delete or leave in – your call.

Kenneth D. Kohn '69 of Rockville Centre, Md., is a financial/insurance planner for The MONY Group working in estate, retirement, and business planning with he and his wife, Susan,

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1970s



Peter Muller '70 of Pawling, N.Y., is the owner of Red Rose Farm. He kept his family dairy farm running until last year. He is now in a transitional period.

Claude Andre St-Pierre, Ph.D. '70 of Toronto, Ont., Canada, received the highest honor given by the Agrologist Association of Quebec, Commandeur de l'Ordre du merite agronomique, in 2000. In 2002, he was proclaimed Professor Emeritus from Universite Laval.

Douglas Kent Wyler (Wohlfeiler) '70 of Rockville Centre, N.Y., is a veterinarian. He is married to Irma Blom Wyler. Liz, he changed his name when he married. Name while in school and at graduation was Douglas Kent Wohlfeiler. Wasn't sure how to indicate that since he's a man! What next?

Mark J. Dewey '75 of Byron, N.Y., has a daughter, Meghan, who

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- Are you interested in receiving our monthly email newsletter with the latest news from CALS and Cornell?
- Would you like to receive invitations to local alumni events via email?

If so, please send an email to us at alsaa@cornell.edu and request to be signed up for the alumni list-serv. Your email address will **not** be publicized and only used for official university correspondence. Be the first to find out the latest news from East Hill! You will also receive invitations via email to events in your area.

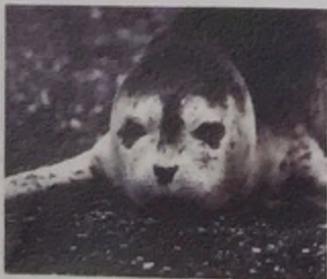
graduated from Cornell (HuEc) in 2002.

Moshe Raccach PhD '77 of Mesa, Ariz., is an Associate Professor and coordinator of the Food Science Concentration in the Morrison School of Agribusiness & Resource Management at Arizona State University East. He is currently on sabbatical in Spain at The Polytechnic University of Valencia Spain.

Peter Chatel '78 of Marietta, Georgia was recently promoted to Vice President, Quality & Analytical Services for Coca-Cola North America.

Judith Greif '79 of East Brunswick, N.J., is a medical writer and nurse practitioner at Princeton University's Student Health Center. She is the author of four health books. Her husband, Joseph, is a computer engineer and daughter, Samantha, is an aspiring Cornellian.

1980s



George R. Frantz '80, MRP '91 of Ithaca, N.Y., founded his own

firm, George R. Frantz & Associates in June 2000 to provide professional Hawaii. Her new name is Michelle L.W. McEntire.

Evan Fay Earle '02 of Freeville, N.Y., is the founder and CEO of E.E.I., an internet rare, old, and unusual book business.

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Bookmark it!

<http://www.cals.cornell.edu/alumni/ALSNews/April2003/issue/index.html>

Check out the new version of ALS News on the web! Now you can read your favorite cover stories, features, and College updates online.

http://www.cals.cornell.edu/public_affairs/alumni/membership.cfm

Now you can pay your ALS Alumni Association membership online. Membership supports student scholarships, regional and on-campus events, college priorities, and more. \$29 (2-year); \$54 (4-year); \$350 (lifetime).

http://www.cals.cornell.edu/public_affairs/alumni/Jobs.cfm

Marketing director, account executive, admissions counselor, associate biologist, gardening spokesperson—these are just a few of the more than 40 recent job postings through the CALS Career Development Office. Looking for a job? Interested in posting a position to the site? Don't miss the latest opportunities!

<http://lifesciences.cornell.edu/>

The New Life Sciences Initiative (NLSI) is a university-wide collaboration that will enhance and support life sciences research and education. It is the most far-reaching research initiative in Cornell history. Meet faculty and students, and learn about the latest news and events.

<http://www.cals.cornell.edu/oap/admissions/>

Everything you wanted to know—list of majors, FAQs, student services, application deadlines, and request information online.

<http://adminders.com/als/>

Hats, t-shirts, sweatshirts, beautiful prints, ceramic mugs, and even a new Cornell golf putter. Great for your gift list!

<http://www.sheep.cornell.edu/sheep/cornellsheepfarm/blankets/index.html>

Stay warm with a Cornell Sheep Program blanket.

http://www.cals.cornell.edu/public_affairs/alumni/gallery.cfm

Browse through the latest photos of alumni events!

What is Agricultural Biotechnology?

Throughout history societies have been concerned with having a safe and abundant food supply. In the last 10,000 years, our ancestors became food producers instead of hunters and gatherers. During this time, they increased the numbers of domesticated plants and animals and modified them through selective breeding. This provided more dependable sources of food, which allowed people to live together and develop larger communities.

Many scientists see biotechnology as a natural progression from traditional breeding techniques, and believe that, whether food is produced with or without biotechnology, the fundamental issues are the same. Is the food safe and does it have high nutritional value? How does its production affect the environment and the economic well-being of the public? How are regulatory policies made to ensure the safety and consumer choice of foods?

What is important is that scientists and the public at large discuss these issues. With less than two percent of the public now directly involved in agricultural production,



Food production systems are complex whether they be conventional, organic, or involve biotechnology.

many may feel left out of the dialogue about the issues involved in agricultural biotechnology.

Food production systems are complex whether they be conventional, organic, either wholly or in part, too involve biotechnology.

They entail questions of technology and society, and perhaps fundamental values for each of us. It is important that we understand the issues and become engaged in the dialogue.

Biotechnology involves methods of using plants, animals, or microbes, either wholly or in part, to make or modify a product or change an existing species.

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Genetic engineering is the process of copying a gene from one living thing

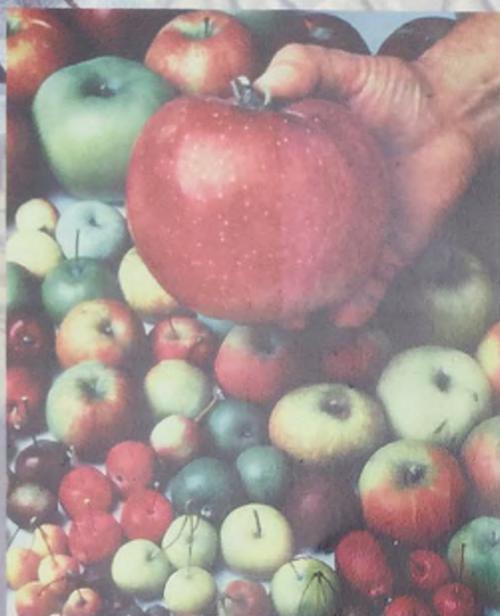
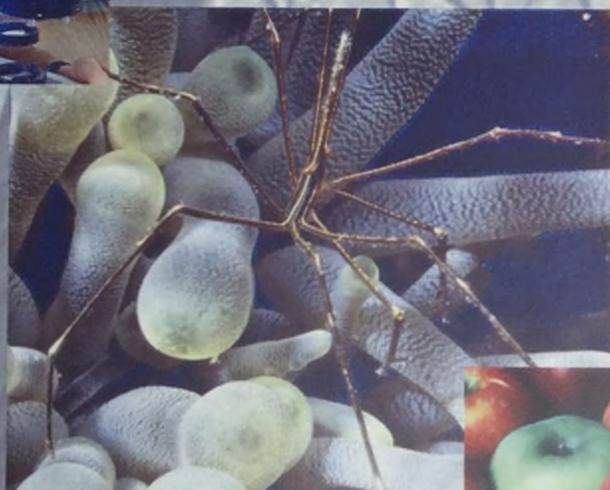
(bacteria, plant or animal) and adding it to another living thing using biotechnology. Products of genetic engineering are often commonly referred to as “genetically engineered organisms” or

“GE products” or “genetically modified organisms” or “GMOs.” Since plants and animals have been modified by selective breeding for more than 10,000 years, they have all been “modified.” Products developed through biotechnology are more properly referred to as “GE products.” Today’s breeders define a genetically engineered organism as an organism that has been improved using genetic engineering techniques in which only a small part of it. Genetic engineering is the process of copying a gene from one living thing (bacteria, plant or animal) and adding it to another living thing using biotechnology. Products of genetic engineering are often commonly referred to as “genetically engineered organisms” or “GE products” or “genetically modified organisms” or “GMOs.” Since plants and animals have been modified by selective breeding for more than 10,000 years.

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A Legacy That Lives On.....

“Through sound financial planning, we created a scholarship that sustains something we both value highly—the education we received at Cornell University, in the College of Agriculture & Life Sciences. We have the satisfaction of knowing we’ll always be remembered, plus our charitable gift annuity provides



a guaranteed stream of income for life.”

—PAUL '65 AND ELIZABETH '64 FOSTER

To explore your own option, contact
Anne Benedict
Director of Development
At 607-2255-7833 or email
adb7@cornell.edu

Ask for a copy of the booklet, “The Charitable Gift Annuity.”



**Friday, October 24 –
Sunday, October 26**
Homecoming Weekend
Cornell vs. Harvard football
game

Saturday, October 25
Homecoming All-Alumni
Tailgate and Pep Rally;
11:00 am – 1:00 pm prior to
the Cornell football game.
Look for the tent outside
Lynah Rink. Check out
various department displays.
Reservations required. For
details, contact Sharon Detzer
'88, (607) 255-1915 or email:
sld4@cornell.edu or Mary
Alo, (607) 255-7651 or email:
mka2@cornell.edu

Friday, October 30
Alumni reception for Wash-
ington, DC and surrounding
areas.
Featured speaker: Brian Earle,
department of Communica-



tion. For details, contact
David Lewandrowski
'85 at (703) 858-7901 (H) or
email: LewandrowskiD@fca.gov

Friday, November 7
ALS Alumni Association
Committee Meetings,
Roberts Hall. For details,
contact ALSAA President
Mollie Pulver '80 at (315)
823-9419 or email:
map76@cornell.edu



Friday, November 7
Outstanding Alumni Awards
Banquet, Carrier Ballroom,
Statler Hotel, Ithaca, NY. For
details, contact Sharon Detzer
'88 at the CALS Alumni
Affairs Office at (607) 255-
1915 or email:
sld4@cornell.edu

**Friday-Sunday, November
7-9**
Department of Animal
Science Centennial,
Ithaca, NY. For details,
contact Alan Bell, chair of the
organizing committee at
awb6@cornell.edu



**Friday, December 24 –
Sunday, October 26**
Homecoming Weekend
Cornell vs. Harvard football
game

Saturday, December 25
Homecoming All-Alumni
Tailgate and Pep Rally;
11:00 am – 1:00 pm prior to
the Cornell football game.
Look for the tent outside
Lynah Rink. Check out
various department displays.
Reservations required. For
details, contact Sharon
Detzer '88, (607) 255-1915
or email: sld4@cornell.edu
or Mary Alo, (607) 255-7651
or email: mka2@cornell.edu



Friday, January 30
Alumni reception for
Washington, DC.
Featured speaker: Brian
Earle, department of Com-

munication. For details,
contact David Lewandrowski
'85 at (703) 858-7901 (H) or
email: LewandrowskiD@fca.gov

Friday, January 7
ALS Alumni Association
Committee Meetings, Roberts
Hall. For details, contact
ALSAA President Mollie Pulver
'80 at (315) 823-9419 or email:
map76@cornell.edu



Friday, February 7
Outstanding Alumni Awards
Banquet, Carrier Ballroom,
Statler Hotel, Ithaca, NY. For
details, contact Sharon Detzer
'88 at the CALS Alumni Affairs
Office at (607) 255-1915 or
email: sld4@cornell.edu

Friday-Sunday, February-9
Department of Animal Science
Centennial,
Ithaca, NY. For details,
contact Alan Bell, chair of
the organizing committee at
awb6@cornell.edu

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Alumni Affairs and Development
College of Agriculture and Life Sciences
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