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The items marked with dollar signs may be available for technology transfer or joint venture.



Europe in Uproar over GM 'Off-Types'

It began with a report on May 17 that a Canadian seed shipment of oilseed rape containing some modified seeds had reached farmers, and by the following day, agriculture in four countries of the European Union was cast in disarray. Government agencies clashed with each other, and the European Union quickly opted out of the fray. Even activists were caught off-guard, unable for weeks to determine what stance they should take. The seed company, it appears, will now be left holding the bag because of the fiasco.

The seed was planted and harvested last year without incident and planted again this year. The news of the 'contamination' came out mere weeks before the rape was about to shed pollen. Many Europeans are horrified by GM pollen, and some journalists compared the event to fallout from the Chernobyl nuclear reactor meltdown.

The seed, a variety of spring rape known as Hyola 38, was produced by Advanta, part of a 50-50 venture between Anglo-Swedish group AstraZeneca Pls and Dutch cooperative Cosun. Howard Morris, Advanta's Winnipeg-based general manager, said the actual GMO content was extremely small, and most estimates put the amount of GM off-types at 0.4 to 0.5%. While the transformation event implicated in the off-types is not licensed for cultivation in the EU, it is approved for food use, since the oil expressed from the seed contains no DNA or protein.

Svalof Weibull's managing director Sten Moberg said that the company had imported an additional 17,850 tons of Hyola 38 rapeseed from Advanta via a Finnish company in March 2000. Advanta advised that the seeds contained 2.6% of genetically modified material, and Weibull impounded the whole consignment intact.

Morris blamed 'a foreign pollen source' for the contamination and said it most likely originated with crops from Alberta or Saskatchewan. Morris said the company's own investigation is still under way.

Just how much rapeseed was grown in the EU from the problem seeds is still being assessed, and the farms where they were planted are being located and identified. The UK government estimated British farmers planted them on 9,000 hectares (22,500 acres) last year and 4,700 hectares (11,750 acres) this year. Sweden estimates that it was grown during the 1999-2000 season on around 1,200 hectares (3,000 acres), and on around 600 hectares (1,500 acres) for the 2000-01 crop. France estimates that the seed was sown on around 600 hectares (1,500 acres) this year as well. Germany estimates that up to 300 hectares (750 acres) had been planted with the seed.

Then Genetic ID, a testing firm based in Fairfield, Iowa, weighed in with a claim that farmers in Britain may have been unwittingly planting a range of genetically modified crops for several years. The company claimed that its tests showed that more than half of 20 random samples of what are supposed to be conventional seeds contain some level of modified seed.

Jeffrey Smith, vice president of the company, said that 12 out of 20 samples of conventional maize contained up to one percent of GM product. Small amounts of maize are grown in Britain as sweet corn with more grown for livestock.

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warning

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An informa publication

As this edition went to press, Advanta Seeds UK had agreed to compensate British farmers who sowed the rapeseed. In a statement, Advanta said that it proposed a "fair and equitable compensation package" to farmers who have grown crops from affected seeds. Advisory panels would fix the amount of compensation in the next few weeks, it added.

Advanta's David Buckeridge said that Advanta would likely follow a similar approach in France to that adopted in Britain and would not discriminate against farmers in other affected countries. "We will take it country by country. Different governments have different approaches. I think in France you will see a similar approach. We won't discriminate against farmers from different countries," Buckeridge said. Compiled from reports by Bridge News, Reuters, London *Financial Times*, London *Daily Mail*, London *Independent*, *Agence France Presse*, BBC Radio, *Post Magazine* and RTL Radio.

Requiem for Modified Potatoes

Fred Zerza, spokesman for closely held J.R. Simplot, a major supplier of french fries to McDonald's headquartered in Boise, Idaho, told the *Wall Street Journal* that J.R. Simplot Co. is instructing its farmers to stop growing genetically modified potatoes because "virtually all" of the fast food chains are asking for conventional potatoes.

Other products are affected as well. Fargo, N.D., farmer Ronald Offutt, one of the nation's largest producers of potatoes, told the *Journal* that he won't raise any genetically modified spuds this year because Cincinnati consumer-products giant Procter & Gamble Co. asked how long it would take him to supply the company with only conventional potatoes. Offutt supplies potato flakes for making P&G's Pringles chips. P&G declined to comment.

In December 1999, McCain Foods and Lamb Weston, both Canadian manufacturers of french fries, decided to no longer purchase genetically modified potatoes. Simplot's announcement means that the three largest french fry manufacturers in North America, which together account for nearly the entire market, will not accept modified potatoes.

McDonald's declined to talk about its potato policy, and a spokesman said the company doesn't comment on its procurement practices.

It may be that McDonald's is becoming increasingly sensitive to the demands of increasingly militant activists. The latest news comes shortly on the heels of two anti-McDonald's incidents in France. On the morning of March 22 a McDonald's employee, Laurence Turbec, 28, was killed in an explosion near Dinan, Brittany. An unidentified bomber or bombers placed three pounds of dynamite outside the drive-through of a McDonald's restaurant, and police said the kitchen timer that was supposed to set the bomb off during the night didn't work. The dynamite blew up when she pushed the door open in the morning, disturbing the charge.

According to the USDA Economic Research Service (ERS), of the 1998 potato crop of 475 million cwt., processors used nearly 282 million cwt. or nearly 60%. Of that amount, 60% was frozen, mostly as french fries. The growth of the fast-food industry, according to the ERS, is the main impetus behind much of the shift toward frozen potato use. In 1998, about 90% of the 7.4 billion pounds of frozen french fries were sold by fast food outlets.

The Bangor *Daily News* later reported that pressure from potato processors forced the closure of Monsanto's NatureMark facility in Crystal, Maine, which produces genetically modified seed potatoes.

"I would be surprised to see even 1% of the (Idaho) crop being a GMO variety this year," said Clen Atchley, a seed potato producer near Ashton, Idaho. Seed potato producers like Atchley, who grows 1,000 acres of seed potatoes, could hardly find buyers for the biotech seed potatoes they produced this year, even though there was not enough non-GMO seed to meet demand.

"The problem for potato growers is that we don't determine the market," Atchley said. "The biggest controllers are the fast food restaurants - McDonald's and Burger King. They are under pressure from environmental groups. It is easy for them to say we don't want to use biotech products."

Concern Could Spread to Sugar

Consumer resistance to genetically modified food, including sugar, may result in farmers stalling in planting GM crops, the International Sugar Organization (ISO) said in a study. "GM hysteria has overtaken any rational debate over the merits of GM foods," the study by ISO economist Lindsay Jolly said.

Transgenic beet modified to resist herbicides, Reuters reports, has been grown in the United States and is awaiting marketing approval in the European Union. Transgenic sugar cane could be ready for marketing in the next few years. Sugar producers said that transgenic beet and cane improved disease resistance, productivity and quality. However, some remain concerned even

though white sugar is 99.9% sucrose, which means it is almost totally chemically pure and does not contain any transgenic DNA.

Food Manufacturer Groups to File Biotech Petition

The Grocery Manufacturers of America (GMA), the world's largest association of food, beverage and consumer product companies, is filing a petition with the US Food and Drug Administration and the Federal Trade Commission, asking the agencies to explain how words such as 'GM-Free,' 'Non-GM' and others can be used on food labels. Those joining in the petition include the American Frozen Food Institute, the Food Marketing Institute, the International Dairy Foods Association, the National Food Processors Association and the Snack Food Association.

The guidance proposed by the petitioners states, among other things, that claims that a food or food ingredient is 'GM-Free' may be considered untruthful or misleading, if they imply superiority.

USDA Report: Biotech Has Little Impact on Trade

Price, not government regulation, will be the primary factor in determining the worldwide demand for genetically altered maize and soybeans, according to a study in the April issue of the *USDA Agricultural Outlook* magazine. Regulatory actions, such as mandatory labeling, will play some part in determining demand for GMO and non-GMO crops, *Bridge News* reports, but the report goes on to say that those regulations could prove to be unrealistic and inflexible and could end up increasing the prices of all foods.

The US only exported about 18% of its total maize harvest in 1998-99. While that accounts for 67% of the international maize trade, the report says that US maize planting decisions are much less susceptible to the vagaries of the global argument on agricultural biotechnology.

International competition in the soy trade is much tighter, the report goes on, and it is easier for countries to find other significant suppliers. The 6 million ton decline in US soybean exports between 1997 and 1998 was the result of importers finding lower-cost sources.

Report: RR Soybeans Yield Less

A two-year study by University of Nebraska researchers showed that glyphosate-tolerant soybeans produced lower yields than conventional soybeans.

According to the *Lincoln Journal Star* the study, conducted by the university's Institute of Agriculture and Natural Resources, showed Roundup Ready soybeans yield 6% less than their closest relatives and 11% less than high-yielding soybean varieties. That averaged to three fewer bushels per acre — or 480 fewer bushels on a 160-acre field.

Randy Krotz, a Monsanto spokesman, attributed the yield lag in Roundup Ready soybeans to the lower-yielding varieties which were modified, and not the modification process itself. "This sounds like some new research that we need to take a good, hard look at," Krotz said.

Chiropractic Journal Warns of GM Food Dangers

Many GE foods are released onto the market before adequate studies are done to test their risks to humans, according an article in the May 2000 issue of the *Journal of the American Chiropractic Association* (JACA). In a statement by the American Chiropractic Association, the group described scientists' warnings of "long-term health impacts of the novel genes" introduced by biotechnology, impacts which "are impossible to predict, because they contain blueprints for proteins never previously consumed by humans in the quantities produced in GE crops."

The article quotes FDA documents which reveal that "corn and potatoes engineered to produce toxins that kill insects are now classified by the Environmental Protection Agency as pesticides, rather than vegetables."

Non-GM Soy Futures Hot on First Trading Day

Concerns over food safety among Japanese consumers is responsible for the "explosive" turnover when the world's first non-genetically modified US soybean futures contracts began trading on the Tokyo Grain Exchange, according to Reuters.

Turnover for the new non-GM soybean futures was estimated at 914,000 tons, compared with 364,000 tons in existing unsegregated US soybean futures. In comparison, estimated volume for soybean futures on the Chicago Board of Trade, the world's largest agriculture product futures market, was about 8 million tons on the same date.

US AgBiotech Patents

6,066,786 - Glyphosate tolerant fescue grasses - Glyphosate tolerant fescue (*Festuca* sp.) grasses are provided. These grasses are particularly suitable for use in lawns, golf courses and other turfs where weeds are a problem. Weed control in areas planted with the disclosed grasses can be achieved by direct application of glyphosate herbicides. Pure Seed Testing, Inc.(Hubbard, OR).

6,066,785 - Method for producing hybrid plants using fertility selective growth media - A method of producing hybrid plants involves inducing cross-pollination of self-pollinating species by selecting a female plant and a male plant having different genotypes, the female plant having a phenotype of sensitivity to a micronutrient deficiency, and the male plant having a phenotype of male fertility, growing the female plant to sexual maturity in a fertility-selective growth medium deficient for the micronutrient, to produce a plant having female fertility and male sterility, growing the male plant to sexual maturity to produce a plant having high male fertility, cross-pollinating the female plant with pollen from the male plant to produce cross-fertilization with essentially no self-fertilization, raising the female plant to produce hybrid seeds having genetic material from both parents, and harvesting the hybrid seeds. Fertility

US AgBiotech Patents

(continued)

selective media can be identified by using a set of check genotypes with known responses to a micronutrient deficiency, choosing as the fertility-selective medium those that give desired differences in male sterility between the standard checks. The plants may be wheat and the growth medium may be deficient for boron. The method preferably comprises determining a correlation between boron content of the male reproductive organs by chemical analysis and observation of degrees of male sterility. Chiang Mai University, (Chiang Mai Province, TH).

6,066,783 - Genes encoding insecticidal proteins -

The present invention is drawn to pesticidal strains and proteins. *Bacillus* strains which are capable of producing pesticidal proteins and auxiliary proteins during vegetative growth are provided. Also provided are the purified proteins, nucleotide sequences encoding the proteins and methods for using the strains, proteins and genes for controlling pests. - Novartis Finance Corporation, (New York, NY).

6,066,782 - Combination of DNA sequences which enable the formation of modified starch in plant cells and plants, processes for the production of these plants and the modified starch obtainable therefrom - A combination of DNA

"The high turnover on the contract's first trading day reflects domestic concerns about the safety of genetically modified food," said Nobufumi Iimori, Nihon Unicom Corp's structured products department manager.

Scientist Claims Transgenes Jump

Research by a leading German zoologist has shown that genes used to genetically modify crops can jump the species barrier, according to *Agence France Presse*. A three-year study by Professor Hans-Heinrich Kaatz at the University of Jena found that the gene used to modify oilseed rape had transferred to bacteria living inside honey bees.

In an interview with *The Observer*, Kaatz said: "I have found the herbicide-resistant genes in the rapeseed transferred across to the bacteria and yeast inside the intestines of young bees. This happened rarely, but it did happen."

Asked if his findings had implications for the bacteria inside the human gut, Kaatz replied, "Maybe, but I am not an expert on this." *The Observer* said Kaatz was reluctant to talk about his work until it is officially published and reviewed by fellow scientists.

Company News

COLLABORATIONS ▼

Agreement For Roll-Out of 'Golden Rice'

The inventors of 'golden rice' have reached an agreement with Greenovation and Zeneca and are working with agencies throughout the world to deliver the technology free of charge in the developing world.

Greenovation was founded in Freiburg, Germany in September 1999. This university spin-off biotechnology company performs and funds research and development in plant biotechnology for agricultural and phytopharmaceutical applications. Agribiotech projects focus on metabolic engineering for increasing nutritional value and on stress tolerance. Greenovation also performs contract research and serves as a platform for development and out-licensing of university research projects to the life science industry.

At the same time, Zeneca will explore commercial opportunities for sales of golden rice into the growing market for healthy foods, while providing regulatory, advisory and research expertise to assist in making the rice available in developing countries.

Golden rice is genetically modified to express beta carotene, which the human body converts to vitamin A. It will help improve human health in developing countries, where Vitamin A deficiency is the cause of 500,000 cases of irreversible blindness each year.

The collaborators anticipate that 'golden rice' will not be available for local planting and consumption until 2003 at the earliest.

Functional Genomics Collaboration Expanded

The functional genomics collaboration agreement between Monsanto and Paradigm Genetics, Inc., executed on November 17, 1999, has been expanded to include Renessen LLC as an affiliate. This expansion allows Paradigm and Monsanto, through Renessen LLC, to work on improving the yields of the most valuable components of grains.

Under the terms of the original agreement, Paradigm is developing functional genomics data and creating a product discovery platform for commercialization by analyzing the product of Monsanto's gene sequencing, bioinformatics and functional genomics research.

Paradigm Genetics is industrializing a process of gene function determination for four economic sectors: nutrition, crop production, industrial products and human health.

NZ Bovine Genomics Venture

The New Zealand Dairy Board has hired Celera Genomics to work with the board's subsidiary company, Vialactia Biosciences, to research the gene traits affecting cattle farming and build a database of information on bovine genetics. It will focus on identifying genes and gene traits in cattle leading to 'sustainable improvements in the dairy industry.'

In particular, the *Farmers Guardian* reports, the project will aim to identify markers for milk production. A pilot project will attempt to sequence 10% of bovine genes and could be followed by a much larger project involving further target genes.

MERGERS/ACQUISITIONS▼

Aventis Selling AgrEvo

Aventis CropScience is selling its herbicide business to Griffin L.L.C, Reuters reports. Griffin is a joint venture of Griffin Corporation and DuPont. The sale of the business, formerly known as AgrEvo, was in response to European Union antitrust concerns, Aventis said in a statement. Financial details were not disclosed.

ALSO NOTED▼

Pioneer Licenses Transformation Technology

Pioneer Hi-Bred has obtained a commercial license from Japan Tobacco for a proprietary *Agrobacterium*-monocot transformation system and related technologies for use in maize and sorghum. Terms of the agreement were not disclosed.

Researchers at Pioneer have been developing and evaluating the technology for the past three years through a research license agreement. "We have demonstrated increased transformation efficiency with some elite genetics," said Tony Cavaliere, vice president and director for trait and technology development - output traits.

Monsanto Files For IPO

Monsanto, now an agriculture chemicals and seed unit of Pharmacia Corp., has filed for a \$100 million initial public offering with the Securities and Exchange Commission. The move was expected, since Pharmacia said it would spin off the ag unit when it acquired Monsanto earlier this year. Proceeds are being targeted for repaying a portion of commercial paper that Monsanto will assume from Pharmacia at the same time as the IPO.

Dealer, Farmers Sue Monsanto, D&PL

Delta and Pine Land Company (D&PL) has been named a defendant in an antitrust lawsuit filed in Federal Court in Birmingham, Alabama. The complaint, which is principally directed at Monsanto's market position and practices in connection with its licensing of cottonseed technology and sales of its Roundup herbicides, accuses Monsanto of various violations of the antitrust laws, including tie-ins and attempts to monopolize, involving those products.

The complaint also names D&M Partners, which is 90% owned by Delta and Pine Land, as defendants, accusing them of being parties to Monsanto's anti-competitive conduct. The lawsuit seeks unspecified treble damages as well as injunctive relief on behalf of certain purported classes of farmers and distributors.

Cargill, Pioneer Settle

In a joint statement, Cargill Inc. said it will pay \$100 million to Pioneer Hi-Bred to settle a lawsuit over Cargill's alleged use of Pioneer genetic material. With the settlement in place, Cargill will proceed with plans to sell its North American seed business, which were brought to a halt when Pioneer filed the suit in October of 1998.

BASF Crop Protection Reorganizing

Two months after agreeing to purchase American Cyanamid from American Home Products, BASF has announced a reorganization of its crop protection business. Pending regulatory approvals, the global headquarters will be moved to Mount Olive, New Jersey. The headquarters will comprise the strategic marketing and the global supply chain units as well as the staff functions.

Celera To Work On Bovine Genomics

Celera Genomics, a unit of PE Corporation, through its Celera AgGen agriculture subsidiary, has signed an agreement with ViaLactia Biosciences New Zealand Ltd., to discover

US AgBiotech Patents (continued)

sequences is described which, in transgenic plant cells and plants, results in the formation of a modified starch which differs from starch synthesized naturally in the cells, especially in respect of its degree of branching and its phosphate content. A process for the production of genetically modified plants which are modified in respect of the physical and chemical properties of the synthesized starch due to the expression of artificially introduced DNA sequences, the plants obtainable by this process, and the modified starch obtainable from these plants, are also described. -Hoechst Schering AgrEvo GmbH, (Berlin, DE).

6,066,781 - Production of mature proteins in plants

- A chimeric gene for use in producing a mature protein in secreted form by stably transformed plant cells is disclosed. The gene includes a DNA coding sequence encoding a fusion protein having an (i) N-terminal moiety corresponding to the portion of the rice .alpha.-amylase signal sequence peptide identified by SEQ ID: 1 and, (ii) immediately adjacent the C-terminal amino acid of said portion, a protein moiety corresponding to the protein to be produced. Also disclosed are

PLANT GENETICS OPPORTUNITY

The USDA Cooperative State Research, Education, and Extension Service (CSREES) announces a vacancy for a National Program Leader for Plant Genetics (GS-14/15). The closing date is August 18, 2000. The announcement is available from the USDA web site at <http://www.reeusda.gov/hrd/SOM-0750.htm>.

US AgBiotech Patents

(continued)

a fusion protein encoded by the gene, and a method of producing a mature protein in secreted form by plant cells. - Applied Phytologics, Inc., (Sacramento, CA).

6,066,780 - Modification of lignin synthesis in plants - The synthesis of lignin by plants is controlled by transformation of the plant genome with a recombinant gene construct which contains the gene specifying an enzyme critical to the synthesis of a lignin precursor, which gene may be in anti-sense orientation so that it is transcribed to mRNA having a sequence complementary to the equivalent mRNA transcribed from the endogenous gene thus leading to suppression of lignin synthesis. If the recombinant gene has the lignin enzyme gene in normal, or "sense" orientation, increased production of the enzyme may occur when the insert is the full length DNA but suppression may occur if only a partial sequence is employed. - Zeneca Limited, (London, GB).

6,066,725 - Production of recombinant polypeptides by bovine species and transgenic methods - Transgenes for producing recombinant polypeptides transgenic bovine species are described. A transgene for producing recombinant polypeptides in the milk of transgenic bovine species comprises at least one expression regulation

novel bovine genes that are important for increasing dairy productivity. Both companies believe that the use of genomics to identify important genes and traits at the molecular level is expected to contribute to sustainable improvements in the dairy industry.

AgraQuest Developing Biopesticide

AgraQuest, of Davis, Calif., has filed a patent application on a novel natural product for controlling insect pests and anticipates bringing a product to the market as early as next year, pending EPA approval.

The product is based on a microbe in the *Actinomycete* family, said Pam Marrone, CEO of AgraQuest. She added that it is related to spinosad products already on the market. The company will not be licensing the technology; rather, it will be developed in-house.

Novartis Rolls Out New Selectable Marker

Novartis has announced the commercialization of a novel marker gene system, called Positech, which offers an alternative to antibiotic resistance or herbicide tolerance marker genes in genetically enhanced crops.

Novartis is currently working with Positech in several crops, in particular maize and wheat. Regulatory dossiers for the first commercial release of these crops with novel traits, which have been introduced using Positech, are expected to be submitted to regulatory authorities within 12-24 months.

Novartis plans to make the technology widely available to both the biotechnology industry and the academic scientific community through licensing. It has already been licensed to more than 100 advanced academic and industry research laboratories around the world.

Novartis will provide Positech royalty-free for subsistence farmers in developing countries, through local institutes or companies, where appropriate regulations are in place to confirm user and consumer safety, and protect local environments for crops modified using Positech.

The marker is an enzyme that enables mannose, a simple sugar not normally processed by plants, to be used as an energy source. Marked cells grow on mannose, surviving to pass on traits for disease-resistance or enriched vitamin content, while normal cells remain inert.

Modified Bacteria Could Affect US Ethanol Industry

US ethanol production could jump from 40% to 160% by 2020, according to an analysis by the US Department of Energy, if genetically engineered bacteria prove effective. The process, Bridge News reports, would turn garbage into the fuel instead of more costly maize, the main material used today.

For now, the cost of producing ethanol from agricultural waste, grasses, woods and municipal waste is estimated to be \$1.15 to \$1.43 per gallon, compared with \$1.10 per gallon for ethanol from maize, and \$0.80 to \$0.90 per gallon for wholesale gasoline.

Advances in processing garbage could, during the next 20 years, reduce cellulose-based ethanol costs to \$0.69 to \$0.98 per gallon, partly by using genetically engineered bacteria in the fermentation process.

Goats To Produce Monoclonal Antibodies

Abgenix, Inc. and Genzyme Transgenics have signed an agreement to commercially co-manufacture Abgenix's experimental ABX-IL8, currently being tested for treating psoriasis. Under the agreement, Genzyme will use transgenic goats to produce large quantities ABX-IL8, a fully human monoclonal antibody, in exchange for undisclosed fees and milestone payments.

BioSteel Deal Pending

Pacific Safety Products Inc. has confirmed that it has been in discussions for the past few months with Nexia Biotechnologies Inc. regarding Nexia's spider silk fiber technologies and the application of those technologies to the protective armor industry. The two companies are currently working toward formalizing a technology development agreement.

Biopesticide Companies Form Alliance

The biopesticide industry has joined together to form a new coalition called the Biopesticide Industry Alliance (BPIA). The mission of the BPIA is to improve the global market perception of biopesticides as effective products and to facilitate the successful registration process of biopesticides.

Shareholders Approve GMOs

Shareholders of Kellogg, PepsiCo, Safeway, Quaker Oats and McDonald's have all overwhelmingly rejected proposals to force the companies to stop using ingredients derived from genetically modified crops. The proposals were filed by the Interfaith Center on Corporate Responsibility, which has targeted nearly two dozen companies with this measure.

At Kellogg, which has twice been picketed by Greenpeace activists in the last six months, the vote was 94% in favor of using GMOs.

PepsiCo shareholders meeting in Plano, where PepsiCo's Frito-Lay Inc. is based, voted about 90% against the proposal. Its Frito-Lay division, citing consumer concern, recently told its farmers not to use genetically altered maize.

Shareholders of Safeway, a US chain of supermarkets which was one of the first to succumb to the Alar apple hoax a decade ago, this time stood firm against activists, with its shareholders soundly defeating the resolution. After the Safeway vote, Susan Vickers, a member of Sisters of Notre Dame de Namur in Belmont, which owns stock in Safeway and supports the resolution, said, "Obviously, there needs to be more education on the part of consumers and corporate management."

Quaker Oats Company shareholders defeated the proposal with a 95% vote. At McDonald's, which refuses to use french fries made from modified potatoes, only 2.1% of shareholders voted for the proposal.

Government News

UNITED STATES ▼

US FDA Outlines New Biotech Regs

The US Food and Drug Administration has outlined a series of steps intended to assure the public of the safety of biotech foods. Biotech companies now voluntarily consult with the FDA before going to market, but the new plan would codify the practice and institute other reforms.

FDA officials acknowledged the new rule will mean few, if any, changes for biofood developers. The companies have considerable freedom to decide what research information and data to share with the agency. The FDA's mandatory consultations will not affect that.

US Senate Votes Biotech Funds

A US Senate budget committee has approved \$30 million in new funding for biotechnology research projects that tackle issues such as malnutrition and hunger in developing countries. The measure was sponsored by Senator Christopher "Kit" Bond.

The University of Missouri-St. Louis would get \$1 million for its International Laboratory for Tropical Agriculture Biotechnology, where researchers are looking for ways to fight diseases that threaten rice, tomatoes, cassava and other crops. And the new Donald Danforth Plant Science Center in St. Louis County would receive \$1 million to teach Thai researchers how to protect plantains and other tropical plants from diseases.

The Senate appropriations committee also approved an agriculture spending bill that includes funding for other biotech research. Sen. Dick Durbin worked to get \$2.8 million to fund animal and plant biotech projects at the Biotechnology Research and Development Corporation in Peoria, Ill.

The agriculture bill includes \$600,000 for University of Missouri researchers to study genetic improvements of soybeans. And the committee approved \$1.3 million for a biotechnology partnership between MU and the University of Illinois. In all, MU would get \$14 million from the agriculture spending bill, including \$500,000 for researchers who are trying to combat a bug that attacks soybean crops and \$2 million for a joint agroforestry research project with the University of Arkansas.

US Finances IP Storage

The US Department of Agriculture has passed an interim rule, effective immediately, implementing the Commodity Credit Corporation's (CCC's) Farm Storage Facility Loan program to provide financing for producers to build or upgrade farm storage and handling facilities.

The USDA decided to issue the rule without prior comment, after determining that delaying matters for a comment period would be "contrary to the public interest."

US AgBiotech Patents (continued)

sequence, a secretory DNA sequence encoding a secretory signal sequence which is functional in mammary secretory cells of the bovine species and a recombinant DNA sequence encoding the recombinant polypeptide. Also included are methods for producing transgenic bovine species. The method includes introducing the above transgene into an embryonal target cell of a bovine species, transplanting the transgenic embryonal target cell formed thereby into a recipient bovine parent and identifying at least one female offspring which is capable of producing the recombinant polypeptide in its milk. The invention also includes transgenic bovine species capable of producing recombinant polypeptides in transgenic milk as well as the milk from such transgenic bovine species and food formulations containing one or more recombinant polypeptide. - Pharming B.V., (Leiden, NL).

6,066,491 - Process for obtaining fungal resistant plants with recombinant polynucleotides encoding .beta.-1,3-glucanase modified for apoplast targeting - Plants are provided with improved resistance against pathogenic fungi. They are genetically transformed with one or more polynucleotides which essentially comprise one or more genes encoding plant and .beta.-1,3-glu-

US AgBiotech Patents (continued)

canases. Preferred are the intracellular forms of the said hydrolytic enzymes, especially preferred are those forms which are targeted to the apoplasmic space of the plant by virtue of the modification of the genes encoding the said enzymes. Particularly preferred are plants exhibiting a relative overexpression of at least one gene encoding a .beta.-1,3-glucanase. Zeneca Mogen B.V., (NL).

6,066,456 - Plant-derived enzyme and DNA sequences and uses thereof

The chemically-inducible 27 kD subunit of the enzyme glutathione-S-transferase, isoform II (GST-II-27) and sequences encoding it are provided. In particular, a genomic DNA sequence encoding the gene promoter for the GST-II-27 subunit is provided. Then linked to an exogenous gene and introduced into a plant by transformation, and GST-II-27 promoter provides a means for the external regulation of expression of that exogenous gene. Transformation with DNA encoding glutathione-S-transferase polypeptides produces herbicide resistance transgenic plants. Zeneca Limited, (London, GB).

6,063,988 - DNA sequences encoding stilbene synthases and their use - The present invention relates to a novel DNA sequence and its use for transforming vectors, host

The USDA also noted that changing market needs are putting pressure on producers to build new facilities since some buyers of grain seek identity-preserved specialty grains that are not genetically modified or to segregate either specialty crops or grains that are not genetically modified. To meet those demands, while utilizing the benefits of genetically modified grains for other markets, the producer may find it necessary to grow different kinds of grain in which case they may need separate storage facilities in order to guarantee the proper identity of the grains.

US Enacts 'Carousel' Sanctions Law

US President Clinton has approved federal legislation which will make US retaliation more effective against countries that violate World Trade Organization (WTO) rules. The Africa and Caribbean Basin Growth and Opportunity Act contains a 'carousel retaliation' provision, which requires the US government to rotate WTO-sanctioned retaliation against nations that refuse to comply with WTO rulings.

The "carousel" provision is intended to increase pressure on the EU to comply with WTO rules by requiring periodic rotation of products on which punitive import duties are levied. While not changing the amount of retaliation being imposed, the carousel approach will increase the number of foreign interests which are penalized.

EUROPEAN UNION ▼

EU Says Hormone Ban Will End US Sanctions

In proposing a definitive ban on a hormone used in US beef production and extending a "provisional" ban on five others, the European Union's executive is claiming such a law should bring it into line with world trade rules and end damaging US sanctions. "We believe this proposal will bring us into line with the WTO's findings, and definitively resolve this dispute," EU spokesman Anthony Gooch told the EU's daily news conference.

The proposed legislation remains to be considered by European Parliament and 15 EU governments.

US cattle producers said the EU proposal would not end the dispute. "It's almost laughable," said Julie Quick, a spokeswoman for the National Cattlemen's Beef Association. "If they keep the ban, how does that end the dispute?"

Neem Tree Oil Patent Revoked

The Opposition Division of the European Patent Office (EPO) responsible for the "Neem tree oil" case has decided to revoke European patent No. 0436257. The decision was reached after two days of oral proceedings during which the owners of the patent, W.R. Grace and the US Department of Agriculture, and the opponents, two non-governmental organizations and one member of the European Parliament, were heard.

In an official statement, the EPO said the patent was revoked since the claims were not novel in light of public prior use, which had taken place in India.

EUROPE ▼

France to Spend \$31 Million On BSE Testing

France will allocate 221 million francs (\$31 million) this year for testing for mad cow disease, according to details of the final French 2000 budget bill obtained by Bridge News. France was slated to launch its nationwide mad cow testing program by the end of April or the start of May.

Wales Adopts Anti-GM Resolution

The Welsh Assembly has voted unanimously to adopt a GM-free environment policy in principle, an official from the agriculture department told Bridge News. The Assembly can now reject applications for experimental releases of genetically modified crops in Wales unless it is confident that the release is not capable of causing damage to the environment.

The official said the motion will not mean in strict legal terms that Wales will be GM-free. He also said it would not affect crops with marketing consent, such as the single GM maize field trial site in Wales that was planted in recent weeks.

Bulgaria to Consider Biotech Moratorium

Bulgaria's parliament is set to vote on a proposal to impose a moratorium on genetically modified organisms used in the food industry, officials said.

A draft of the proposal, obtained by Reuters, was introduced last month by a member of the ruling Union of Democratic Forces party but government agencies were divided over it. The Agriculture Ministry said it opposed a ban, while the Environment Ministry said it would back it.

"Imposing a moratorium is a legal guarantee that Bulgaria's exports of agriculture products to the European Union will not be blocked. It should be in force until the harmonization of Bulgarian standards with the EU's," the draft said.

Institute Director Professor Atanas Atanasov was shocked by the proposal to introduce the moratorium. "If the parliament approves it, Bulgaria will probably be the only country in the world that bans scientific research of GMOs," he said. "What we need is not bans but new sound regulations and rules on GMO in compliance with the EU and [rest of the] world," he said.

SOUTH AMERICA▼

Brazil Favors European Labeling Proposal

Brazil will support a European Union proposal to create an international agreement whereby all products containing genetically modified organisms should be labeled, officials say. Bridge News reports that the proposal will be presented at the next meeting of the International Food Labeling Council in Ottawa, Canada.

The government rejected a model proposed by the US government that would leave virtually all GMO foods free from labeling.

Brazil Recommends Cheap GMO Test

Embrapa, the research arm of Brazil's Agriculture Ministry, says soybean exporters may avoid expensive tests to prove their soybeans are free of GM strains with a simpler method. Soybeans placed in paper towels moistened with a diluted solution of glyphosate herbicide will reveal whether they are conventional or GM seeds, Embrapa said.

The test has a margin of error of about five percent, and some DNA testing companies are saying the test is imprecise and primitive. But Nascimento said the test is 95% reliable, simple and cheap.

ASIA▼

Ministry Panel Wants GM Safety Tests

A Japanese Health and Welfare Ministry advisory panel has proposed the government conduct obligatory safety tests on genetically engineered food under the food sanitation law. The *Jiji Press* reports that the Food Sanitation Investigation Council recommended that food made entirely or partly from a genetically modified biological substance should undergo a safety test prescribed by the health minister.

Grain Traders Discount Japanese GMO Approval Rule

Japanese grain traders are playing down the importance of new government procedures to approve the safety of GMOs, saying the action was aimed at calming consumer worries and would not disturb trade.

Traders said consumer worries were overblown because all seed companies that want crops grown from their genetically altered seeds to be exported to Japan have been cooperating with the Health Ministry. "Suppliers know that unless they get approval from the Japanese government, they will lose sales in this lucrative market," said one grain trader at a major Japanese trade house. "They have been seeking the government's approval, and they will continue to do so. Whether it is voluntary or mandatory is not a big issue," he added.

China Redrafting Seed Law

Chinese legislators are working on a new draft of plant protection legislation, according to *Xinhua*, during the current session of the Standing Committee of the National People's Congress. The participants agreed that it is necessary to create a seed law that protects the interests of farmers and boosts the development of agriculture and forestry in China.

US AgBiotech Patents (continued)

organisms and plants and for producing novel plants which are male-sterile and which exhibit an altered flower color. - Bayer Aktiengesellschaft, (Leverkusen, DE).

6,063,986 - Polypeptide compounds and nucleotide sequences promoting resistance to eutypa dieback in plants

- Polypeptide compounds and nucleotide sequences promoting resistance to eutypa dieback in plants. The subject of the invention is a nucleotide sequence coding for an enzyme with eutypine reductase activity, capable of metabolizing the eutypine synthesized in plants by a fungus of the *Eutypa lata* or *Libertella blepharis* type. The overproduction of eutypine reductase by the plant host of the fungus enables the consequences of the presence of this fungus in plants to be attenuated or even eradicated. - Societe des Domaines Viticoles Martell, (Cognac, FR).

6,063,985 - Chemical inducible promotor used to obtain transgenic plants with a silent marker

- A chemically inducible promotor is described which may be used to transform plants with genes which are easily regulatable by adding plants or plant cells to a medium containing an inducer of the promotor or by removing the plants or plant cells from such medium. The promotor

US AgBiotech Patents (continued)

described is one which is inducible by a glucocorticoid which is not endogenous to plants. Such promoters may be used with a variety of genes such as ipt or knotted1 to induce shoot formation in the presence of a glucocorticoid. The promoter may also be used with antibiotic or herbicide resistance genes which are then regulatable by the presence or absence of inducer rather than being constitutive. Other examples of genes which may be placed under the control of the inducible promoter are also presented. - The Rockefeller University, (New York, NY).

6,063,756 - Bacillus thuringiensis cryET33 and cryET34 compositions and uses therefor - Disclosed are Bacillus thuringiensis strains comprising novel crystal proteins which exhibit insecticidal activity against coleopteran insects including red flour beetle larvae (*Tribolium castaneum*) and Japanese beetle larvae (*Popillia japonica*). Also disclosed are novel B. thuringiensis crystal toxin genes, designated cryET33 and cryET34, which encode the coleopteran-toxic crystal proteins, CryET33 (29-kDa) crystal protein, and the cryET34 gene encodes the 14-kDa CryET34 crystal protein. The CryET33 and CryET34 crystal proteins are toxic to red flour beetle larvae and Japanese beetle larvae. Also disclosed are meth-

Singapore To Strengthen Food Inspections

Singapore is to beef up already-stringent checks on its imported food supplies by posting food safety inspectors abroad, according to *Agence France Presse*. "Given the proliferation and abundance of agricultural chemicals, drugs and antibiotics used in livestock production, the task to keep our food safe is formidable," Minister for National Development Mah Bow Tan said. "To improve the assurance of food safety, AVA (Agri-Food and Veterinary Authority) will place officers in major food source countries to augment the inspection of food supplies at source."

Philippines to Draft Regs For Commercial Release

The Philippine Department of Agriculture (DA) is preparing guidelines for the commercialization of genetically modified (GM) farm commodities, *BusinessWorld* reports. Assistant Agriculture Secretary for policy and planning Segfredo Serrano said a team of four experts will assist the agency in crafting the regulations, which will complement existing government rules on the conduct of field experiments involving genetically modified organisms.

"The existing guidelines may not be adequate to handle this because this is a novel area," Serrano said in a recent interview. "The guidelines that we have now only go up to the testing stage... We still do not have rules governing [commercialization]. Since our existing field test guidelines are already stringent, we can expect the commercialization guidelines to be just as strict," he said.

INDIA▼

India Approves Bt Cotton

The Indian government has given biosafety clearance to a genetically engineered variety of cotton developed by Monsanto, the *Asian Age* reports. The clearance given by the Department of Biotechnology (DBT) paves the way for large-scale cultivation and marketing of transgenic cotton in the country.

Since this is the first time in India that a genetically modified agricultural crop has been recommended for large-scale cultivation and marketing, this may open the doors for the commercial cultivation of other GM crops.

These trials created a controversy last year and a petition filed in the Supreme Court by Vandana Shiva, an eco-feminist, who challenged the legality of the field trials and sought a ban on introduction of Bt cotton in India. The case is coming up for hearing in July.

OCEANIA▼

Tasmania Wants 'Opt-Out' Clause, Bans Research

The Tasmanian Government is considering its position on an inter-governmental agreement covering GM crops, the Australian Associated Press reports. Minister for Primary Industries, Water and Environment, David Llewellyn, signaled his reluctance to sign any agreement with the Commonwealth pending further investigation.

"My main concern is that signing an agreement reduces the options available to the states to make individual choices. The agreement centralizes the decision-making processes in Canberra and leaves the States with limited options.

Llewellyn said the Tasmanian Government had not yet established a policy on whether GM crops should be grown in Tasmania. Among other investigations, he has asked the Tasmanian Food Industry Council for its recommendations and, in the meantime, has ordered a moratorium on GM trial crops at Government research stations.

Regulatory Filings

Monsanto Files for GUS Exemption

The US EPA has received a pesticide petition from Monsanto, proposing an exemption from the requirement of a tolerance for the 'plant pesticide' D-glucuronidase (GUS) as a "plant-incorporated protectant formulation inert ingredient," as expressed in plants in or on all raw agricultural

commodities. The petition was made pursuant to section 408(d) of the FFDC, 21 USC. 346a(d), to amend 40 CFR part 180.

GUS has no pesticidal activity.

Technology Business Opportunities

Technology Transfer Opportunities - USDA ARS \$

Each month, the USDA's Agricultural Research Service makes about 400 new findings, many of which may be appropriate for further research and development in concert with a private partner. The findings below were selected by **ABR** from among many other recent ARS developments. For access to them, as well as to ARS patents available for licensing, visit <http://www.nalusda.gov/ttic/tektran/new.html>.

[31-P]-Nmr Spectroscopy Analysis Of Photosystem II Complexes From Higher Plant Chloroplasts: Detection Of Phosphorylated Serine And Threonine Residues In Proteins And Elevation Of Phosphoserine Content. A major target of abiotic stresses is the chloroplast, a photosynthetic organelle. One proposed mechanism by which plants cope with abiotic stresses involves addition of a phosphate molecule to key chloroplast membrane proteins at a threonine residue. Researchers found that phosphorylated serine in the protein complexes is markedly enhanced in response to drought, heat, cold and salt stress. They propose that enhanced serine phosphorylation may be a common, adaptive response of vegetative tissue to abiotic stresses. This information is useful to plant scientists to identify targets of abiotic stress in order to develop strategies to produce stress-resistant germplasm. *Contact Autar Mattoo, fax (301) 504-5555, email amattoo@asrr.arsusda.gov.*

Inheritance And Qtl Analysis Of Anthracnose Resistance In The Cultivated Tomato (*Lycopersicon esculentum*). High levels of genetic resistance to anthracnose exist in wild or unadapted tomato germplasm, but this resistance has been difficult to transfer into elite materials with an intensity equal to that observed in the wild donor parent. Difficulty in transferring the high level of resistance observed in small-fruited germplasm to commercial type lines was attributed in part to the occurrence of multiple genetic factors, each with a relatively small effect, which influence resistance. Researchers have now identified molecular markers linked to resistance genes, which will facilitate transfer of anthracnose resistance genes from wild germplasm into cultivated tomato. *Contact John Stommel, fax (301) 504-5555.*

Cloning, Characterization, And Functional Expression Of A Phospholipase Da From Tomato Fruit. Breakdown of various structural components of the cells that make up the tomato fruit tissues causes undesirable textural changes associated with fruit senescence. Understanding the action and control of specific enzymes involved in the breakdown of cell structural components has long been a goal, and researchers have identified one such enzyme, PLD, which degrades phospholipids, the primary building blocks of cell membranes. They characterized the gene that codes for tomato fruit PLD, making it possible to genetically alter the level of PLD and thus determine whether the enzyme plays an important role in tomato ripening and senescence. It is expected that reduction of the level of PLD may also maintain quality and extend storage-life of tomato slices, since this enzyme becomes much more active when the fruit tissues are cut. *Contact Bruce Whitaker, fax (301) 504-5107, email whitaker@asrr.arsusda.gov.*

A Peanut Seed Lipoxigenase Responsive To *Aspergillus* Colonization. Previous work has shown that a product of a plant enzyme, lipoxigenase, affords some protection from aflatoxin production by *Aspergillus*. For this reason, researchers cloned the gene for peanut lipoxigenase and determined its sequence. The cloned enzyme was further characterized. Interestingly, *Aspergillus* infection of peanuts caused an increase in the amount of lipoxigenase produced. This work would be of interest to other scientists working on aflatoxin control in crops. *Contact Harold Gardner, fax (309) 681-6693, email gardnehw@mail.ncaur.usda.gov.*

Marker-Assisted Analysis Of Three Grain Yield Qtl In Barley (*Hordeum vulgare* L.) Using Near Isogenic Lines. Barley genes for good malting quality occur very near barley genes for good yield, and it was previously hard to get both of the optimized sets of genes into the same progeny. In addition, the improved yield traits were small and hard to measure. Scientists used molecular techniques to prepare barley lines that have improved yield genes from the good-yielding, poor-malting barley Steptoe and malting quality genes from the good-malting, poor-yielding variety Morex.

Using modern gene techniques, it was possible to create barleys that had genes for both high yield (three sets) and good malting quality (two sets). Testing of these lines in four locations showed that the genes for high yield increased different plant characteristics that should increase yields under stressful conditions.

However, under the benign conditions that occurred in the breeders plots, no major yield increases were found. In one case, it seems likely that the barley line would benefit farmers by maintaining relatively high yields under stressful growing conditions; in the other two cases, it appears that the tested genes probably must interact with other genes before improved yields will be obtained. These results will allow barley breeders to breed lines that will yield better under stressful conditions and still have good malting *Contact Bernie Jones, fax (608)264-5528, email bljones@facstaff.wisc.edu.*

US AgBiotech Patents (continued)

ods of making and using transgenic cells comprising the novel nucleic acid sequences of the invention. - Monsanto Company, (St. Louis, MO).

6,063,629 - Microinjection process for introducing an injection substance particularly foreign, genetic material, into procaryotic and eucaryotic cells, as well as cell compartments of the latter (plastids, cell nuclei), as well as nanopipette for the same - The invention relates to a microinjection process for introducing an injection substance, particularly genetic material, into procaryotic and eucaryotic cells, as well as cell compartments of the latter (plastids, cell nuclei). It is disadvantageous in the prior art that the cell is damaged by the glass pipette. This problem is obviated by the invention in that the nanopipette (10), which has an external diameter of 0.05 to 0.2 μm , an internal diameter of 0.1 to 1.5 μm and a tip diameter of 0.025 to 0.3 μm is used and is filled with the injection substance (1) and a heat-expandable substance or substance mixture and the capillary of the nanopipette (10) is then sealed with an adhesive, the pipette tip, with the aid of a microscope and a micro-manipulator, is stuck into the desired plastids, bacterium or cell compartment/cell nucleus and the nanopipette is heated by means of a regulatable

US AgBiotech Patents (continued)

heater (12) until the injection substance passes out of the pipette tip at an out-flow rate of up to 1 femtoliter per second and enters the plastids, bacterium or cell compartment/cell nucleus, whose diameter is 1 to 20 μm . The invention also relates to the correspondingly filled nanopipette, which is heatable by a regulatable heater for temperature-controlled injection purposes. - Wolfgang Lummel, (Zug, CH).

6,063,605 - Bacillus thuringiensis endotoxin genes and methods of use - Novel strains of the insecticidal microorganism *Bacillus thuringiensis* are described. These contain novel genes, and in particular a gene coding for a novel insecticidal endotoxin, 81 kilodaltons in length, toxic to both Lepidoptera and Coleoptera. The novel strains and the genes they contain may be used to combat insect attack against plants. - Zeneca Limited, (London, GB).

6,063,601 - Chimaeric gene coding for a transit peptide and a heterologous peptide - Chimaeric DNA sequence which encodes: 1) a transit peptide of a cytoplasmic precursor of a chloroplast protein or polypeptide of a plant and 2) a protein or polypeptide that is heterologous to the transit peptide. The chimaeric DNA sequence can be used as a vector for transforming a plant cell so that a chi-

Repression Of Aflatoxin Biosynthetic Genes In *Aspergillus flavus* By Acetosyringone.

The identification of a plant metabolite that alters the expression of aflatoxin biosynthetic (AF) genes may contribute to the elimination of aflatoxin in agricultural commodities. Scientists have now demonstrated that acetosyringone represses two genes called *nor1* and *ver1* in the AF pathway. They used a system to show that the two genes making the precursors of AFB1 were repressed by the metabolite. By gaining an understanding of the regulation of AF pathway genes, it should be possible to design rational strategies for control of aflatoxin production. *Contact Sui Sheng Hua, fax (510)559-5777, email ssth@pw.usda.gov.*

Genetic Markers Associated With Green And Albino Plant Regeneration From Embryogenic Barley Callus. Genetic engineering of barley has been hard, because genes can be delivered only to cells grown in the lab, not to whole plants. This regeneration process has been very difficult for barley, and ways to improve this process have been searched for. One way is to identify existing genes that are in barley which influence the regeneration process, and develop molecular "tags", or markers, for these genes.

Scientists now report having identified markers for plant regenerability in barley, and demonstrated that the ability to regenerate plants from cultured cells of particular plants can be predicted based on their markers. These results can now be used to speed the development of more efficient systems for genetically engineering barley. *Contact Paul Bretziger, fax (208) 397-4165, email dwesenb@uidaho.edu.*

Development Of An Sts Marker Assay For Detecting Loss Of Heterozygosity In Rice Hybrids. Loss of heterozygosity (LOH) has long been observed in human cancerous cells, but it was only recently reported in plants. Because LOH can accelerate genotype fixation in rice hybrids, it is useful in rice breeding programs that release inbred cultivars. However, LOH will be a problem for hybrid rice production when one or both parents possess the gene(s) for LOH. Such F1 hybrid rice will be phenotypically variable. To determine whether the tested lines carry the LOH gene, scientists developed an efficient STS marker system to detect the LOH phenomenon in rice hybrids of parental lines polymorphic for the OPE15 750/300 locus on rice chromosome 2. *Contact Richard Wang, fax (435) 797-3075, email rrwang@cc.usu.edu.*

Molecular Mapping And Characterization Of Genes Controlling Fiber Quality In Cotton. By use of several hundred DNA markers and an interspecific F2 population derived from a cross between an Upland genetic standard TM-1 and 3-79, an extra long staple (ESL) cotton, scientists identified thirteen quantitative trait loci (QTLs) controlling fiber quality properties, four QTLs for bundle fiber strength, three for fiber length, and six for fiber fineness. These QTLs collectively explained 30% to 60% of the total phenotypic variance for each fiber quality property in the F2 population. For the fiber quality QTLs that were additive and recessive, marker-assisted selection would be very effective in cotton breeding programs. The linked DNA markers would also provide useful tools to compare the fiber quality genes' different genetic backgrounds. *Contact Russell Kohel, fax (979) 260-9333, email rjk0339@acs.tamu.edu.*

Congruence Of Conventional And Molecular Studies To Locate Genes That Control Synthesis In Maize Silks Of Compounds Antibiotic To The Corn Earworm. The present of maysin, a naturally occurring chemical in the silks of maize, is an important defense against damage in corn by the corn earworm in the Southeastern United States. Researchers studied three maize lines with high silk-maysin concentrations to determine the number and location of genes controlling maysin production. The data indicated that genes for maysin production were probably present on four chromosomes of the line GT114, four chromosomes of the line GE37, and three chromosomes of the line SC102. These results generally agree with similar studies and molecular genetic studies to locate genes for maysin production. Data are now available to assure effective development of elite lines with high-maysin silks. *Contact Neil Widstrom, fax (912) 391-3701, email cgbr@tifton.cpes.peachnet.edu.*

Metabolic Mechanisms Associated With Alleles Governing The 16:0 Concentration Of Soybean Oil. Researchers have developed soybean germplasm with natural genetic mutations that reduce palmitic acid (a saturated fatty acid) concentration from 12% to 3% of soybean oil. This trait brings total saturated fat levels of soybean oil in compliance with FDA regulations for health claims of food product labels. The genetic basis for this trait was traced to a gene that controls the amount of palmitic acid produced by the fatty acid synthetic pathway. This is the first documentation of the genetic basis for the low-palmitic acid trait in soybean. *Contact Richard Wilson, fax (919) 515-7959, email rwilson@cropserv1.cropsci.ncsu.edu.*

DOE Bioproducts Grants \$

The US Department of Energy (DOE) is seeking applications from private and public institutions of higher learning to promote multidisciplinary education and training programs for graduate students at the Masters or Ph.D. levels in the area of renewable bioproducts. Contributions to this new industry would come from traditional academic programs in crop production, such as agronomy, crop and soil sciences and forestry, and from basic science programs, such as genomics, biology and microbiology.

The objective of this new education initiative is to produce graduates who can enter the complex biobased products industry and effectively integrate the knowledge from a wide range of technologies that are necessary for this industry to grow.

DOE anticipates approximately three to five grant awards will be made, ranging from approximately \$70,000 to \$100,000 each year for a maximum of three years in duration. These grants will

cover both the costs for establishing a new crosscutting academic and research program in this field as well as full stipends for two or so deserving graduate students at the Masters or Ph.D. level.

The deadline for receipt of applications is June 20, 2000. For more information, *contact Marshall Garr, phone (208) 526-1536, email garrmc@id.doe.gov.*

Fungal Biocontrol for Fire Ants \$

Texas Tech scientists, after working on a biological control for fire ants for 10 to 12 years, have isolated a common soil fungus that attacks only insects. To see if the fungus bait formulation was responsible for killing ants, Texas Tech scientists genetically altered the fungus to include an enzyme that indicated the presence of the fungus in dead ants.

"We then found a way to encapsulate the vegetative material in the fungus, called mycelia, into a pellet," said Harlan Thorvilson, one of the scientists on the project. "We were able to dry down the pellet, or dehydrate it, so that they're like Grape Nuts, then store it."

"The fungus reactivates by rehydrating it with moisture, it starts to grow nicely, starts to produce spores, and the spores are deadly to the fire ants." When the ants go to investigate for food, they find the fungus-laced pellets. They are attracted to the pellets, pick them up and deliver them to their colony. In the moist underground of the colony, the pellets rehydrate, produce spores and kill off the ants.

"As soon as we're ready to bring on a commercial partner and market this product, it will be another tool in our pest management toolbox. Used in conjunction with insecticides, parasites and other means of control, we might be able to suppress them enough to alleviate some of the economic damage they cause," Thorvilson said. He anticipates it will take an additional two years to ready the fungal bait for sale in stores. *Contact Harlan Thorvilson at phone (806) 742-2764, email rthgt@ttacs.ttu.edu.*

Activism News

May Day Mayhem

The first of May is typically a date of spring festivities and, in some countries, a day to celebrate socialism or communism. This year, it marked a series of eco-reactionary events around the world.

When May Day arrived, demonstrations turned violent in several parts of Europe and hundreds of protesters took to the streets in US financial centers. In New York, where 600 people massed at Union Square, police arrested 19 who called themselves anarchists.

Leftists briefly clashed with hundreds of neo-Nazis in Berlin and later fought pitched battles with police. About 50 people were injured in clashes in the port city of Hamburg. Hundreds of leftist and anarchist demonstrators fought police armed with water cannon, clubs, tear gas and riot shields in Berlin's Kreuzberg district, in what has become a May Day tradition.

Swiss police fired teargas and rubber bullets at so-called "revolutionary" protesters who smashed windows and damaged cars at a BMW showroom during a march in Zurich. Several people were hurt when anarchists and police clashed in the Polish city of Krakow.

In Russia, where for decades May Day was marked by colossal workers' marches choreographed by the communist state, tens of thousands joined rallies. But protests were smaller than previous post-Soviet gatherings. Mass visits to tourist spots marked May Day in China after the government declared the whole week a holiday, in a move intended to stimulate consumer spending.

Masked demonstrators fought riot police in London as an eco-reactionary demonstration degenerated into what British Prime Minister Tony Blair called "mindless thuggery." Parliament Square was sealed off when the grass in the center was ripped up and laid across the road by Reclaim the Streets (RTS), in what they called a "guerrilla gardening" protest. A

US AgBiotech Patents (continued)

maeric precursor of the heterologous protein or polypeptide is produced in the cytoplasm of the cell and the chimaeric precursor then transports the heterologous protein or polypeptide in vivo into a chloroplast of the cell. - Plant Genetic Systems, N.V., (Brussels, BE); Bayer A.G., (Lever Kusen, DE).



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International Patents

WO 0004133 **Agrobacterium-mediated transformation of turfgrass** - Rutgers, The State University - A method of obtaining transgenic turfgrass plants by an *Agrobacterium*-mediated transformation protocol is disclosed. The protocol makes use of a modified *Agrobacterium* vector system in which selectable marker genes and other genes of interest are operably linked to strong promoters from monocotyledonous plants, such as actin and ubiquitin promoters, that function efficiently in turfgrass cells. Transgenic turfgrass plants of several species, produced by the *Agrobacterium*-mediated transformation method, are also disclosed.

WO 0004146 **A synthetic polynucleotide coding for human lactoferrin, vectors, cells and transgenic plants containing it** - Plantechno Srl - A synthetic polynucleotide encoding human lactoferrin, modified with respect to the natural gene so as to maximize its expression in vegetables, on the basis of the preferential use of the codons is described. Moreover, the vectors containing such sequence, that having regulation elements activated in a controlled way determine its tissue- and stage-specific expression are further described. The vegetal cells and the plants transformed with the aforementioned vectors, as well as the production processes of functional foods, vegetal milks, and human lactoferrin, utilizing them are also described.

WO 0004155 **Compositions and methods for enhancing disease resistance in plants** - Purdue Research Foundation - Compositions and methods for

statue of wartime leader Winston Churchill was defaced, and the Cenotaph, Britain's most important memorial to the dead of both World Wars, was daubed with anti-war slogans. The demonstrators tried, and failed, to storm St Martin's in the Field Church, but a masked group smashed up shops and a McDonald's restaurant.

Nine police officers were injured when the "Guerilla Gardening" demonstration in Parliament Square organized by a group called 'Reclaim the Streets' turned violent. One officer sustained facial injuries after being hit in the face with a brick, and another suffered a dislocated shoulder.

Labor, Eco-Reactionaries Team Up

Labor and environmental activists who found a common cause during last winter's World Trade Organization protests now are joining forces for protests across the US, according to the Associated Press. Targets include the Republican and Democratic national conventions this summer.

The activist partnership "is very significant," said Margaret Levi, political science professor and director of the Center for Labor Studies at the University of Washington in Seattle. "It reflects a real change in the labor movement from what it has been in the last several decades and really most of its life," she said.

DNA-Free Tomatoes

Fifty percent of the food grown in the United States is contaminated with disease-causing and environmentally-damaging genetically modified organisms, according to the DNA Free Food (DFF) Society. The group claims it has DFF technology which "can put an end to this threat to human health and our pristine environment."

"Consumers would be shocked to know that even organic foods contain DNA," according to the group's website, and quotes a representative from Greenpeace [sic] as saying, "not enough research has gone into studying the long-term effects of eating DNA."

The website also offered a page where visitors could participate in a survey. In admitting that the entire exercise was a hoax, its author also revealed the results of the survey: Of the 435 people who participated in the survey, 23% said they would pay ten times as much as usual for DNA free food. Another 48% said they would pay a premium of 50% or more to avoid DNA, while to their credit, 52% said they would pay nothing more for such food.

UNITED STATES ▼

Activists Hit US Facility

The anti-biotechnology activist group Reclaim the Seeds (RTS) is claiming responsibility for an attack on the USDA's Agricultural Research Service (ARS) Western Regional Research Center in Albany, Calif., on May 21. This is the second time the group has struck this facility, which is jointly owned by the University of California (Berkeley) and the activists managed to evade security which was heightened after the first attack.

Activists Hit Seminis Facility-Twice

A group calling themselves 'Future Farmers of America' (FFA) is taking responsibility for two attacks on the Seminis Vegetable Seeds Research Center in Woodland, Calif., on the evenings of May 23 and May 24. In an official statement issued through Genetix Alert, the group said it destroyed numerous plants, including tomatoes, broccoli, peas, onions and peppers.

"With the growing season heating up," says Genetix Alert, which claims to have no knowledge of any criminal activity, "the direct action anti-GE movement is intensifying its activities in North America."

Seminis told the Sacramento *Bee* that two fields and a greenhouse suffered moderate damage. It said it increased security after the first incident and was unable to explain how the second incident could have happened.

Activists Leverage NRC Report: Petition Filed vs. Modified Squash

Activist groups including the National Resources Defense Council, Greenpeace, Sierra Club, Environmental Defense and the Union of Concerned Scientists are asking the US Department of

Agriculture to withdraw its approval of genetically engineered squash because of concerns that it could cross with a wild relative and make it a hardier weed. The Associated Press reports that the squash is modified to make it resistant to plant viruses. A recent study by the National Academy of Sciences questioned whether the USDA had considered adequately whether the virus resistance could spread from the squash to its wild cousin, which is a pest to farmers in some southern states.

Activists to Target US Presidential Race

The Campaign To Label Genetically Engineered Foods has outlined its strategy for gaining the passage of the Genetically Engineered Food Right to Know Act into law over the next five or six months. The group intends to take advantage of the fact that there is no incumbent running in the US presidential campaign. This may make it possible, the group says, to draw the presidential candidates into the debate over genetically engineered foods, which the group believes will be “essential” to its success.

California May Budget Millions In Preparations for Activism

In light of plans by activists from across the US to conduct massive demonstrations at the Democratic National Convention, California’s governor is asking the state legislature for \$4.1 million so Los Angeles police and the California Highway Patrol can pay overtime and buy equipment in preparation for potential riots, vandalism or terrorism.

Groups Pressure NAS on Balance, Disclosure

A number of activist groups, headed by Center for Science in the Public Interest (CSPI), is renewing criticism of the National Academy of Sciences regarding committee balance and conflicts of interest. While they criticize a recent report by the NAS Committee on Genetically Modified Pest Protected Plants they say that report merely “exemplifies the need for balance.”

The CSPI, backed by such groups as Environmental Working Group, Environmental Defense, Natural Resources Defense Council, Union of Concerned Scientists and National Environmental Trust, said in a letter to the NAS that it is a ‘mistake’ to believe “that balance may be obtained by having an equal representation of individuals from industry, consumer groups and academia.”

The groups said that the NAS should “use its best efforts to insure greater committee balance and to provide more disclosure information on a routine basis.”

Activists Hit Two Hawaiian Sites

A group calling itself ‘Menehune’ has taken responsibility for two attacks on agricultural research in Hawaii. On May 9, they struck the Novartis Research and Parent Seed Center near Kekaha, Kauai. During the attack, the group claims, it completely destroyed one test plot of maize, while “removing bags over the corn ears that contained pollen and mixed pollen from different corn throughout other test plots to invalidate the experiments.”

On the following night, May 10, the group vandalized the Kauai Agricultural Resource Center, which is operated by the University of Hawaii at Manoa and the USDA’s Agricultural Research Service. At that site, the group claims, mostly fruits such as papayas and pineapples and flowers such as anthuriums and dendrobium orchids, were destroyed.

Activists Against Arson Probe

Carrying signs that said “Stop Government Terrorism,” demonstrators gathered outside a federal courthouse to protest a US grand jury investigating a string of eco-terrorism attacks across the country.

The Associated Press reports that nearly 50 people gathered in support of Craig Rosebraugh, who was told he must make a sixth appearance before the grand jury in June, when he faces contempt charges if he refuses to answer questions about the Earth Liberation Front. “It’s another round of ridiculous drama that seems to be going nowhere,” said Rosebraugh, whose subpoena to appear was later canceled.

Rosebraugh acts as spokesman for the Earth Liberation Front, or ELF, which has claimed responsibility for a New Year’s Eve arson attack on the office of a biotechnologist in Michigan, and for other arson attacks in Oregon, Colorado, Indiana and Oregon. The ELF also took responsibility for the recent destruction of 800 genetically modified plants at the University of Minnesota.

International Patents (continued)

enhancing or creating plant disease resistance to plant pests are provided. Transforming a plant with a novel maize, sorghum, or rice disease resistance gene homologue (RGH) of the invention enhances disease resistance of the plant. Transformed plants, plant cells, tissues, and seed having enhanced disease resistance are also provided.

WO 0004159 **Amino polyol amine oxidase polynucleotides and related polypeptides and methods of use** - Pioneer Hi-Bred International, Inc. & Curagen Corporation - The present invention provides polynucleotides and related polypeptides of the enzyme APAO isolated from *Exophiala spinifera* and *Rhinochlamydia atrovirens*. Additionally, the polynucleotides encoding for the APAO enzyme can be used to transform plant cells normally susceptible to *Fusarium* or other toxin-producing fungus infection. Plants can be regenerated from the transformed plant cells. Additionally, the present invention provides for expressing both APAO and a fumonisin esterase in a transgenic plant. In this way, a transgenic plant can be produced with the capability of degrading fumonisin, as well as with the capability of producing the degrading enzymes. In addition, the present invention provides methods for producing the APAO enzyme in both prokaryotic and non-plant eukaryotic systems. Methods for detoxification in grain, grain processing, silage, food crops and in animal feed and rumen microbes are also disclosed.

WO 0004160 **Amino polyol amine oxidase polynucleotides**

International Patents (continued)

and related polypeptides and methods of use - Pioneer Hi-Bred International, Inc. & Curagen Corporation - The present invention provides polynucleotides and related polypeptides of the enzyme APAO isolated from *Exophiala spinifera*. Additionally, the polynucleotide encoding for the APAO enzyme can be used to transform plant cells normally susceptible to *Fusarium* or other toxin-producing fungus infection. Plants can be regenerated from the transformed plant cells. Additionally, the present invention provides for expressing both APAO and a fumonisin esterase in a transgenic plant. In this way, a transgenic plant can be produced with the capability of degrading fumonisin, as well as with the capability of producing the degrading enzymes. In addition, the present invention provides methods for producing the APAO enzyme in both prokaryotic and non-plant eukaryotic systems. Methods for detoxification in grain, grain processing, silage, food crops and in animal feed and rumen microbes are also disclosed.

WO 0004173 **Methods and means to modulate programmed cell death in eukaryotic cells** - Plant Genetic Systems N.V. - Means and methods are provided to modulate programmed cell death (PCD) in eukaryotic cells and organisms, particularly plant cells and plants, by introducing of "PCD modulating chimeric genes" influencing the expression and/or apparent activity of endogenous poly-ADP-ribose polymerase (PARP) genes. Programmed cell death may be inhibited or provoked. The invention particularly relates to the use of nucleotide

Activist Penalty Law Passes Assembly

A bill that would create criminal and civil penalties for destruction of agricultural research crops passed the California Assembly by a 67-6 vote, the Sacramento *Bee* reports. Assemblywoman Helen Thomson drafted the legislation in reaction to crop vandalism at the University of California, (Davis) last year. AB 2510 would make any person who willfully destroys research crops at public institutions liable for twice the value of the crops damaged. Value includes costs associated with the development of the plants.

State Governors To Promote Biotech

Thirteen US state governors concerned that opposition to genetically engineered food could hurt farmers and biotech companies in their states have announced plans to promote the industry, the Associated Press reports. They hope to reassure the public that "these aren't just the big, bad chemical companies trying to engineer something to jam down your throats," said North Dakota Governor Ed Schafer.

AFIA Launches Biotech Initiative

After years of prodding, the US biotech industry appears to be abandoning its siege mentality through efforts to bring information on modern genetics to a wider audience. The American Feed Industry Association (AFIA) has launched a Food Safety Leadership Plan, which the group hopes will position it as "both a prominent player and an informational resource on food safety issues related to the feed industry." The plan initially focuses on agricultural biotechnology.

UC Davis Steps Up Security For Research

Security around University of California (Davis) research crops will be significantly increased in the hopes of preventing attacks similar to the ones that occurred in the fall, the *California Aggie* reports. "We have to step up efforts to protect the crops," Dean of the College of Agricultural and Environmental Sciences Neal Van Alfen said. "We have had to respond (to the attacks) with increased security to protect our experiments."

CANADA ▼

Activists Invade Supermarket With Labels

A group calling itself the 'Citizens' Volunteer Labelling Collective' invaded a Provigo supermarket in Montreal, Canada, and stuck warning labels on food, the *Calgary Herald* reports. After about 10 protesters entered the downtown supermarket, the store closed for nearly an hour while about 40 others congregated outside.

The Montreal *Gazette* reports that the supermarket closed its doors after police alerted it to the demonstration. Of the activists inside, 2 were arrested, 1 for refusing to leave, the other for vandalism.

UNITED KINGDOM ▼

Greenpeace Vandals Face New Trial

The Crown Prosecution Service is to seek a retrial of Lord Melchett and 27 other Greenpeace activists on charges of conspiracy to commit criminal damage to a field of GM crops, *Bridge News* reports. A jury earlier failed to reach a verdict on the charge, while clearing the defendants of the charge of stealing GM crops which stemmed from the same incident.

The CPS said the decision to seek a re-trial on the criminal damage charges was taken by a senior CPS lawyer following careful consideration of the issues.

Officials Investigate Email Advice

Officials from the British Home Office are investigating whether an email message being circulated constitutes a legal offense, according to the *London Times*. The message gives instructions to anti-biotechnology activists on how to damage GM crops and take direct action against farmers.

The message describes direct action as "the most wonderful and liberating experience" and suggests that one way of frightening farmers would be to organize groups of masked protesters armed with scythes to operate at night. It says that such action might goad farmers into a violent reaction.

Dairy Farmers Pull Out Of Trials on Threat

PA News reports that dairy farmers Barry and Mary Symons were have pulled out of the UK government's trials of genetically modified fodder maize crop at Portholland on the Roseland Peninsula, near Truro, Cornwall. They took the step, according to activist group Friends of the Earth, after their milk buyer, Peninsula Milk Producers Ltd., threatened to stop collecting milk from the farm.

Herbicide Tolerance Genes Found In Honey

Calls for a ban on field trials of genetically modified oil seed rape have been renewed after honey bought in a shop near a trial site was found to contain GM pollen, the Glasgow *Herald* reports. The call to stop the trials was backed by the Scottish Beekeepers' Association, whose vice-president, Les Webster, said there was no approval for the sale of honey containing GM pollen. Friends of the Earth sent eight jars of honey and one honeycomb to a laboratory in Austria for analysis and DNA testing. Two of these samples were reportedly found to be positive for GM herbicide resistant genes.

Biotech Companies Respond To Activists

Biotech companies have mounted a counter-attack on concerns and health-hazard claims over Scotland's first field-scale trials of genetically modified crops, the Aberdeen *Press and Journal* reports. "People in Aberdeenshire are being subjected to a disinformation campaign by green groups intent on wrecking the GM farm-scale trials," said CropGen, an information initiative by four biotech companies.

UK Activists Convicted, Fined

Bridge News reports that three UK activists involved in attacking a field of genetically modified crops may be the first people in the country to be convicted of causing criminal damage to GM crops. All three were found guilty of causing criminal damage to part of an oil seed rape crop at Model Farm in Watlington, Oxon, on July 18 last year.

EUROPE ▼

Italy 'Declares War' On Biotech

Tebio was originally set to be an international conference focused on educating consumers about biotechnology, in the quiet port city of Genoa, Italy. It was scheduled for May 24-26, and things did not go very well. In a sudden reversal, Italy's Agriculture Minister Pecoraro Scanio, after 'declaring war' on genetically modified crops and foods, revoked sponsorship for the conference.

The city of Genoa enacted a ban on genetically modified crops. Mauro Cordo, a spokesman, said Genoa town council voted overwhelmingly to ban the cultivation and marketing of GM crops on land under its jurisdiction, citing concerns over possible health and environmental risks.

During the convention, a crowd estimated at 4,000 marched in Genoa to protest genetically modified foods, Reuters reports. Police armed with truncheons and carbines escorted the march, which drew activists from a wide range of eco-reactionary groups. Occasional scuffles broke out between activists and police. At least 40 officers ringed a McDonald's restaurant, located on the square where the march began in central Genoa.

Activists Seek Reversal Of EC Maize Approval

Greenpeace has launched a new legal attack on a line of genetically modified maize. The maize was recently approved by the European Commission, but the group claims that the original scientific evaluations submitted by developer Novartis were "inappropriate and scientifically flawed."

To demonstrate irregularities, Greenpeace is relying on a report it commissioned from Ecostrat, a group of Swiss scientists. It is the same report which the US Environmental Protection Agency dismissed as "scientifically questionable" in denying a petition to cancel all BT registrations in the US.

Belgian Experimental Farm Attacked

Activists are claiming that a 'Festival of Resistance' in Belgium, attended by approximately 200 persons, ended in an attack on Monsanto's experimental farm near Franc-Waret, Belgium. The group, attended by Belgian Green MEP Paul Lannoye, Marc Vanoverschelde from the Belgian peasant union Mouvement d'Action Paysanne, destroyed several parcels of maize and canola, while a rock band played in the background.

International Patents (continued)

sequences encoding proteins with PARP activity for modulating PCD, for enhancing growth rate of for producing stress tolerant cells and organisms.

WO 0004175 **Methods and composition for modulating flavonoid content** - Unilever Plc, Unilever Nv & Hindustan Lever Limited - A method for manipulating the production of flavonoids in tomatoes by manipulating gene activity in the flavonoid biosynthetic pathway by expressing genes encoding chalcone isomerase, compositions for use in such a method and tomato plants having altered flavonoid levels are disclosed.

WO 0004176 **Process to collect metabolites from modified nectar by insects** - Stichting Centrum Voor Plantenveredelings-En Reproductieonderzoek (Cpro-Dlo) - The invention relates to a recombinant double-stranded DNA molecule comprising an expression cassette comprising the following constituents: i) a promoter functional in nectaries of plants, ii) a DNA sequence encoding a protein which is fused to the promoter, iii) a DNA sequence encoding a signal peptide that targets the recombinant protein to nectar, which is translationally fused to the DNA sequence encoding the recombinant protein, and optionally iv) a signal sequence functional in plants for the transcription termination and polyadenylation of an RNA molecule. The invention further relates to isolating and purifying the gene product from the honey.

EP 0973374 **DNA sequences encoding solanidine udp-glucose glucosyltransferase and**

International Patents (continued)

use to reduce glycoalkaloids in solanaceous plants - The United States Of America, Represented By The Secretary Of Agriculture - DNA sequences which encode the enzyme solanidine UDP-glucose glucosyltransferase (SGT) are disclosed. Recombinant DNA molecules containing the sequences, and use thereof, in particular, use of an antisense DNA construct to inhibit the production of SGT and thereby reduce glycoalkaloid levels in solanaceous plants, e.g., potato, are described.

EP 0973375 **Reduced linolenic acid production in soybeans** - Iowa State University research Foundation, Inc. - Soybeans (i.e., *Glycine max* L. Merr.) possessing a novel genetic determinant for the reduced production of linolenic acid in the endogenously formed vegetable oil of the seeds are provided. Such genetic determinant is the homozygous recessive fan3fan3 gene pair that has been found to be capable of formation through mutagenesis. In a preferred embodiment a soybean plant possesses the combined presence of the homozygous recessive gene pairs (1) fan1fan1 or fan1(A5)fan1(A5), (2) fan2fan2, as well as (3) fan3fan3 for reduced linolenic acid formation in the seeds and has been found that an unusually low expression for linolenic acid production in the resulting vegetal oil of seeds is provided that is less than 1.3 percent by weight and most preferably is no more than 1.1 percent by weight based on the total fatty acid content. A vegetable oil is made possible in this instance that is particularly well suited for frying applications in the absence of the need for hydrogenation.

▼INDIA

Greenpeace Establishing Presence In India

In the May 24 edition of *The Hindu*, the following ad appeared in the employment section: "Chief Executive Director: New Delhi . . . Qualification: Sound understanding of regional political & business processes. Report to Greenpeace International Regional Development Manager. Experience: Should have understanding of empathy with &/or passion for environmental issues, strong but consultative leadership, interpersonal & management skills, financial management skills & ability to generate & communicate vision." No salary or benefit information was disclosed.

Gurumurti Natarajan, a plant molecular biologist formerly with Agrotech Ltd., and currently head of Greenthumb, an agribusiness consulting firm in India, told **ABR** that Greenpeace "is seeking to establish a permanent presence in India, with a central office in New Delhi and campaign office in Mumbai [Bombay]."

International News

Codex Defines 'GMO'

Meeting in Ottawa, Canada, the member nations of the United Nations succeeded in reaching agreement on a definition of 'GMO' to be used in labeling genetically engineered foods. The *Codex Alimentarius*, Commission, a United Nations body which establishes international voluntary standards on foods, represents 164 countries.

Under the terms of the agreement, the expression "genetically-modified organism" (GMO) is defined as "an organism in which the genetic material has been modified through genetic technology in a way which does not occur naturally by reproduction or by natural recombination." Once this is approved by the member nations, the Europe Information Service reports, it is expected to be adopted as an amendment to the general standards for labeling pre-packed food products.

Biosafety Protocol Signed

After years of wrangling and opposition to key parts of the treaty, the Cartagena Protocol on Biosafety was agreed to at a conference in Kenya's capital Nairobi. The UN agreement, which will introduce new regulations for trade in GMOs, was signed by 62 countries.

The so-called Miami Group, which links the world's biggest GMO exporters including the United States, Canada, Australia and Argentina, had opposed major portions of the Protocol to the very end, and Argentina was the only member among the leading Miami Group nations to sign.

G8 Summit to Consider Modified Foods

Genetically modified foods will be a key point on the agenda of the forthcoming summit of Group of Eight leaders in Okinawa, Japan, in late July, the London *Financial Times* reports.

G8 officials have informally agreed to table the issue, and the Organization for Economic Cooperation and Development (OECD) is compiling a set of five reports for debate. The main focus of discussion is expected to be the safety of GM foods, their environmental impact and harmonization of safety standards.

EUROPEAN UNION ▼

Cowpats Could Extend BSE Epidemic

Leading scientists are suggesting that the 'mad cow' (BSE) epidemic may last longer than expected because cattle are at a "real risk" of catching the disease from the cowpats of infected cattle, the BBC reports. BSE experts believe cattle may continue to catch the disease through contaminated soil long after the date that the government believed was possible.

Alan Dickenson, the founding director of the Neuropathogenesis Unit in Edinburgh which researches BSE, warns that animals born after August 1996 may nonetheless have caught the disease a "third way," through infected soil.

The disease's five-year incubation period means it will not be possible to tell whether Dickenson is right until 2001.

EU Launches Group to Explain Science Developments

The European Union has launched an initiative to better explain scientific developments to the general public as a new study showed widespread opposition to genetically modified food. Reuters reports that the European Commission at a press conference presented a group of 11 scientists who will advise the EU executive on matters such as cloning and GM foods, and also openly discuss people's "fears, hopes and sometimes rejection" of new developments in bioscience.

The need for such a dialogue was highlighted by a new Eurobarometer study, which showed that ordinary people in the EU were deeply wary of genetically modified food.

European Biotech Attitudes Continue to Worsen

European wariness of biotechnology is still on the rise, and this sentiment applies to both agricultural and medical applications of the science, according to the latest Eurobarometer survey.

Agence France Presse reports that only 41% of Europeans believe biotechnology will improve their lives over the next 20 years, compared with 47% three years ago. In addition, 23% consider biotechnology will have a negative effect on their lives, up from 19% previously.

The survey said the biggest shift in hostility over the past three years had taken place in southern Europe and also in Britain, which has been the seat of the "mad cow" scare that has sensitized the public to questions of food safety.

BSE Rates Rising

The New York *Times* reports that efforts to stop the spread of bovine spongiform encephalopathy, or 'mad cow disease' in Europe, may have failed. Furthermore, the failure may indicate that there is a cause of BSE or a means of its transmission, which continues to elude scientists.

The number of cases of mad cow disease discovered in France, as in many other countries in Europe, has been climbing steadily. The totals are still minuscule compared with those in Britain, which has reported 178,000 cases of the deadly degenerative brain disease since 1986, and endured a four-year ban on its beef by other European nations.

GREAT BRITAIN ▼

More Sites Approved For UK Trials

The UK government's GM unit says that 12 new sites have been included in its update on the environmental trial program for genetically modified crops, according to Bridge News. A spokeswoman from the GM unit said the government was following EU procedure, responding to criticism from environmental campaign group Friends of the Earth, which said the sites were announced without consultation with local people.

British Lupin Could Replace GM Soy

The British *Times* reports that farmers in England may begin cultivating lupin in order to satisfy a demand for non-GM animal feed. Lupin, the article claims, could eventually be used for flour in cakes, biscuits, bread and pizzas.

Already 150 farmers have signed up to trials of lupin. Britain imports two million tons of soy a year and it would need at least a million acres of lupin fields for Britain to be self-sufficient.

British Supermarkets Caught Misleading Consumers

Britain's Advertising Standards Authority (ASA) has ruled that Tesco, Britain's largest supermarket chain, misled shoppers over the benefits of organic food by making false claims about it. It also ruled that a second store, Iceland, was guilty of printing unsubstantiated and exaggerated warnings about genetically modified food.

The London *Daily Mail* reports that Tesco made unfounded claims for the health, taste and price of organic foods, by describing organic farming as the "environmentally friendly alternative to chemicals, fertilizers and pesticides that can damage the soil and kill off nature's own nutrients." The chain also claimed that the prices for organic food were "a little higher," though "better-tasting."

Iceland was found guilty for failing to justify six of the nine claims it made in an anti-GM leaflet. The ASA said it was "concerned that the leaflet exaggerated the facts about genetically modified food and considered that it was an unacceptable appeal to the reader's fear." The store

International Patents (continued)

EP 0973884 **Phosphate-deficiency inducible promoter** - Performance Plants, Inc. - This invention provides an isolated promoter which induces transcription of a gene under conditions in which phosphate is limited to an organism. Vectors, host cells, and transgenic photosynthetic organisms incorporating this promoter are also provided.

EP 0973905 **Plant pyruvate dehydrogenase kinase gene** - National Research Council Of Canada - The present invention relates to the isolation, purification, characterization and use of a mitochondrial pyruvate dehydrogenase kinase (PDHK) gene (pYA5; ATCC No 209562) from the *Brassicaceae* (specifically *Arabidopsis thaliana*). The invention includes isolated and purified DNA of the stated sequence and relates to methods of regulating fatty acid synthesis, seed oil content, seed size/weight, flowering time, vegetative growth, respiration rate and generation time using the gene and to tissues and plants transformed with the gene.

EP 0973906 **Strawberry promoters and genes** - Monsanto Company - Promoters and genes isolated from genomic DNA of strawberry plants are disclosed. Both the promoters and genes are capable of tissue-specific expression in transgenic plants. A plant promoter that is a nucleic acid region located upstream of the 5' end of a plant DNA structural coding sequence that is transcribed at high levels in ripening fruit tissue. This promoter region is capable of conferring high levels of transcription in ripening fruit tissue and in developing seed tissues when used as a promoter for a heterologous coding sequence in a chimeric

International Patents (continued)

gene. The promoter and any chimeric gene in which it may be used can be used to obtain transformed plants or plant cells. A DNA coding sequence that codes for a gene that is highly transcribed in ripening fruit tissue of *Fragaria X ananassa*. This coding sequence can be used to obtain a cDNA probe useful in obtaining analogous promoters from a homologous coding sequence in other plant species. Chimeric genes including the isolated promoter region, transformed plants containing the isolated promoter region, transformed plant cells and seeds are also disclosed.

EP 0973907 **Control of floral induction in plants and uses therefor** - Cold Spring Harbor Laboratory - The *Id* gene which controls flower evocation in maize plants is described. The maize nucleic acid is similar to that of genes encoding zinc-finger regulatory proteins in animals. Methods of isolation or preparation of other regulatory protein genes in plants and their uses are disclosed.

EP 0973910 **Bacillus thuringiensis toxins** - Mycogen Corporation - The subject invention pertains to novel insecticidal toxins and genes which encode these toxins. Also disclosed are novel nucleotide primers for the identification of genes encoding toxins active against pests. The primers are useful in PCR techniques to produce gene fragments which are characteristic of genes encoding these toxins.

EP 0973912 **Inducible plant promoters** - The Minister Of Agriculture Fisheries And Food In Her Britannic Majesty's Government Of The United

blamed GM technology for the deaths of 37 people in the US linked to tryptophan produced by modified bacteria, an event later traced to a faulty manufacturing process.

Iceland also implied that soya modified to contain a gene from Brazil nuts had been found harmful to people who suffer nut allergies and failed to make clear that viral genes used in biotechnology were from a plant virus rather than human one, said the ASA.

Charles Renews Attack On Biotech

The London *Evening Standard* reports that Prince Charles launched a "devastating attack" on the 'potentially disastrous consequences' of GM food and cloning. Charles used the platform of the prestigious Reith Lecture to claim the relentless rush into genetic engineering means "literally nothing is held sacred any more" and scientists are treating the world as a giant laboratory.

His speech provoked a response from Nobel laureate James Watson. He accused Charles of pandering to superstition and raising irrational fears. Watson added that there was absolutely no evidence that GM food posed a threat to human health and predicted it would prove hugely beneficial to mankind.

EUROPE ▼

Animal Feed Scare In Belgium

The European Commission is claiming that a new animal feed scare in Belgium will pose no threat to food exports, Reuters reports. Around 201 farms, all in Belgium, have been placed under surveillance until the extent of the contamination has been established.

Non-GM Pet Food

The French agricultural cooperative Cana-Caval has eliminated genetically modified ingredients from a large portion of the pet food it makes, MSNBC reports. The announcement was issued shortly after a similar decision by the giant French supermarket chain Carrefour to ban genetically modified ingredients from its store-brand pet foods. The soy, maize and other grains added to pet foods will be subjected to genetic testing to ensure the product is non-GM.

ASIA ▼

Japan Manufacturers Halt Biotech Development

The US Embassy Attache reports that six major food manufacturers in Japan carrying out research on genetically modified (GM) products have decided to postpone commercialization of GM foods. The postponement could extend up to several years, because company officials have determined the products would not be accepted in the market because of spreading misperceptions about the safety of GM foods among consumers.

Quoting *Asahi Shimbun*, the report says that concern in Japan is growing over the possibility that "the biotech food industry will be monopolized by American and European manufacturers through importation of GM foods developed by technologically advanced companies." The Ministry of Agriculture, Forestry and Fisheries (MAFF) and manufacturers, according to the report, agree that "Japan will be left behind in future when the GM market expands."

Philippine Bt Trials Successful, More Planned

Agroseed Corp. intends to carry out more field experiments on the cultivation of genetically modified maize after successfully completing its limited field test in General Santos City, Philippines, last March.

Manuel Logrono, Agroseed's research director, told *Business World* that the company hopes to do more plantings in the country's major maize-growing areas to further test the resistance of the genetically modified variety against the Asiatic corn borer pest.

Agroseed, a wholly owned subsidiary of Monsanto, is doing its experiments in tandem with the Institute of Plant Breeding (IPB) of the University of the Philippines Los Banos.

Findings presented by Agroseed and IPB showed that the Bt maize plants remained healthy while the non-Bt plants suffered heavy damage to leaves, stalks and ears. Researchers also found Bt maize yields to be 30% to 68% higher than the non-Bt plants, while having no effects on beneficial insects such as spiders, coccinellid beetles (ladybugs), green lacewings and soil arthropods.

China May Launch Seed Satellite

China's space and agriculture departments are considering launching a satellite specially designed for seed-breeding in space. "Space seed-breeding is expected to become a strong driving force behind Chinese agriculture in the 21st century since it can bring about high-yield and high-quality crops that are hard for ordinary breeding methods to obtain," said Liu Luxiang, director of the Aerospace Breeding Center under the Chinese Academy of Agricultural Sciences.

Xinhua reports that in space seed-breeding, seeds are sent into space in recoverable space vehicles or high-altitude balloons, where they then mutate in conditions that feature micro-gravity and cosmic radiation. Back on earth, the seeds are planted and used for breeding "fine strains that are disease-resistant, early-maturing, high-quality and high-yield."

Korean Firm Develops GMO Test

Biotechnology venture firm Nexgen has developed two types of test kits that identify genetically-modified food, the *Korea Herald* reports. The company said its products are cheaper to produce and capable of detecting genetic modifications in crops faster and more easily than foreign imports.

"This development will replace foreign test kits in the domestic market for its low price and simple methods with far lower error rate," a company official said. Currently, Korean health authorities and private institutions use foreign-made test devices. The company expects the demand will increase since the government plans to make it mandatory to label some crops, like maize and soybeans, starting in March next year.

Pioneer Moves Philippine Trial Location

Pioneer Hi-Bred Philippines intends to conduct field experiments for genetically modified maize in Mindanao instead of Laguna as earlier planned, according to *BusinessWorld*. Pioneer is one of two companies which gained government approval to conduct field trials of Bt maize in concert with the University of the Philippines in Los Banos (UPLB).

Eduardo Fernandez, deputy director for transgenic crops of UPLB's Institute of Plant Breeding (IPB), said Pioneer decided to carry out its experiments in General Santos City instead of Bay, Laguna, since the company did not find the latter site secure.

INDIA ▼

India Favors Organic, Says Minister

India is conducting initial trials on GM crops and is examining the possibility of introducing them, the federal Agriculture Minister said. Sundar Lal Patwa told Reuters that India was not opposed to introducing GM crops but would look at the success of them in other countries before beginning cultivation in India.

"The trials of genetically modified crops are at a very initial stage," Patwa told Reuters. "As of now, we are examining all possible options. We have not made up our mind whether to introduce it or not. I cannot give a timeframe when we can introduce them. I think we should not jump into GM crops just because developed countries are doing it," the minister said.

Patwa said India would focus on organic farming before going into GM crops. The government has set up an expert committee to look into ways to boost organic farming. "We are aware that we can raise the yields of many crops through organic farming," Patwa said. "That way, we can preserve the fertility of our cultivable lands, unlike chemical-aided farming."

OCEANIA ▼

GM Harms Whakapapa, Say Iwi

Tampering with the genes of native New Zealand plants and animals will destroy sacred whakapapa links between the human and natural world created by the ancient Maori gods, says Maui Solomon, the lawyer who represents three iwi of the Maori.

Maori had firm views on genetic engineering and as the guardians of native flora and fauna under the Treaty of Waitangi, their concerns should be the first issue on the agenda of the royal commission on genetic modification, says Solomon. He is also representing the iwi in a 1991 Waitangi Tribunal claim, which is still before the tribunal, seeking recognition of the intellectual property rights of Maori over native flora and fauna.

International Patents (continued)

Kingdom Of Great Britain - A recombinant polynucleotide comprising a promoter sequence being: (a) an inducible promoter obtainable from apple, or (b) a functional portion thereof, or (c) a functional derivative or homolog promoter being at least 70 % homologous to either. The promoter sequence is preferably activated in response to which agents are specific to ripening fruit and is most preferably the apple 'beta'-Galactosidase (ABG1) promoter, or the 1-AminoCyclopropane-1-Carboxylate synthase (ACC Synthase) promoter. Such transgenic plants and fruit have storage and pest-resistance properties superior to non-transgenic varieties.

EP 0973913 **Soybean plant producing seeds with reduced levels of raffinose saccharides and phytic acid** - E.I. Du Pont De Nemours And Company - The instant invention pertains to the identity, characterization and manipulation of a soybean enzyme that results in the alteration of raffinose saccharide, sucrose, phytic acid and inorganic phosphate content of soybean seeds, thus leading to valuable and useful soybean products. The instant invention comprises soybean lines with decreased capacity for the synthesis of myo-inositol 1-phosphate in the tissue of developing seeds in comparison to seeds of other soybean lines. As taught herein, reduction of myo-inositol 1-phosphate synthase enzymatic activity by any of several means will result in soybean seeds displaying the instant phenotype.

EP 0973919 **Plant 4-alpha-glucanotransferases** - E.I. Du Pont De Nemours And Company -

International Patents (continued)

This invention relates to isolated nucleic acid fragments encoding all or a substantial portion of a corn, rice, wheat or soybean 4- α -glucanotransferase. The invention also relates to the construction of chimeric genes encoding all or a portion of a corn, rice, wheat or soybean 4- α -glucanotransferase, in sense or antisense orientation, wherein expression of the chimeric gene results in production of altered levels of 4- α -glucanotransferase in a transformed host cell.

EP 0973920 **An oleosin 5' regulatory region for the modification of plant seed lipid composition** - Rhone Poulenc Agro - The present invention is directed to 5' regulatory regions of an *Arabidopsis* oleosin gene. The 5' regulatory regions, when operably linked to either the coding sequence of a heterologous gene or a sequence complementary to a native plant gene, direct expression of the coding sequence or complementary sequence in a plant seed. The regulatory regions are useful in expression cassettes and expression vectors for the transformation of plants. Also provided are methods of modulating the levels of a heterologous gene such as a fatty acid synthesis or lipid metabolism gene by transforming a plant with the subject expression cassettes and expression vectors.

EP 0973922 **Strawberry fruit promoters for gene expression** - Calgene Llc - Promoters isolated from genomic DNA of strawberry plants are disclosed. The promoters are capable of tissue-specific expression in transgenic plants. A plant promoter that is a nucleic acid region located

Five New Zealand Research Programs 'Busted'

The Wellington *Evening Post* reports that a government sweep of New Zealand research programs has turned up five instances of illegal genetic engineering experiments. Victoria, Massey, Waikato and Canterbury universities, along with the Crown research institute Environmental Science and Research, were all found to be violating the Hazardous Substances and New Organism Act in the course of their work.

The Environmental Risk Management Authority (ERMA) has given the researchers less than three weeks to ensure all GE research is approved, or they will face fines.

NZ Regulation Could Drive Out Research

The Wellington *Dominion* reports that New Zealand medical researchers feel disadvantaged by the Hazardous Substances and New Organisms Act regulating genetic engineering. Warren Tait, head of Otago University's biochemistry department and a member of the Health Research Council, says that Auckland University researchers wanted to create a transgenic sheep but faced big costs because of the regulatory process.

"But the same work can be done in Australia very easily," Tait pointed out. "So there is some degree of frustration among researchers that competitive, important work is being held up under the new authority."

New Zealand MP Wants New Probe

The Christchurch *Press* reports that New Zealand MP Jeanette Fitzsimons wants a probe launched in the wake of suggestions that illicit genetically engineered organisms are being sold in the country. Fitzsimons, co-leader of the Green Party, while chairing the parliamentary select committee on local government and environment, said she had been shown a fish food sample sent to New Zealanders through the mail. Recipients were being told the fish food was a "bio-engineered nutrient organism," she said.

Australian Consumers Against Biotech

The majority of Australians are against the consumption of genetically modified food, according to a new survey. A national survey of 950 people found 68% of adults were 'not happy' about eating GM food. Ninety percent agreed foods containing any GM ingredients should be clearly labeled as such, while nearly half (45%) do not believe GM food has any benefits, according to the AC Neilsen survey.

Only 20% believe in the benefits of GM food and were happy to eat it, while 12% did not believe there were benefits but were happy to consume it. Despite a federal government brochure distributed in February through supermarkets about GM food, less than 20% of people felt they had been well informed about GM food.

AMERICAS ▼

Most Consumers Back Biotech Foods

At the Food Marketing Institute (FMI) conference in Chicago, the FMI revealed data from a survey conducted for the association by Research International USA. The survey showed that support for genetically modified food slipped slightly, but a majority of consumers still back the technology.

Sixty-three percent of shoppers surveyed in January said they would be very or somewhat likely to buy a new variety of produce that had been genetically engineered to resist insect damage. That is down from 77% in a similar poll four years ago.

Fifty-four percent said they were very or somewhat likely to buy produce that was modified to taste better or stay fresh longer, compared with 58% in 1996. The survey had a margin of error of plus or minus 3 percentage points.

Biotech Causes Rift In Dietetic Association

Differences of opinion on biotechnology have produced a division among the membership of the American Dietetic Association, the *Oregonian* reports. That disagreement became evident at an annual dietitians' conference at Oregon Health Sciences University focusing on genetically modified foods.

The group's official position, developed in 1992 and reaffirmed in 1994, states, "Biotechnology techniques have the potential to be useful in enhancing the quality, nutritional value and variety of food available for human consumption, and in increasing the efficiency of food production, food processing, food distribution and waste management." The position is now under review.

"Genetic engineering is unneeded, unpredictable and unwanted by many people," said Sue Roberts, an Iowa research nutritionist. "There are so many red lights we need to look at."

Eighteen dietitians have signed a statement protesting that the American Dietetic Association has accepted money from Monsanto and ConAgra, to help finance its nutrition fact sheets and consumer hot line. "We are very displeased at ADA's acceptance of money from [Monsanto] to function as a mouthpiece," Steen said.

Organic Food Labels Found Misleading

A new poll finds the US Department of Agriculture's (USDA) proposed rules for labeling organic food products will seriously mislead consumers into thinking the products are safer, better in quality or more nutritious.

The survey, conducted by International Communications Research of Media, PA on behalf of the National Center for Public Policy Research, found two-thirds of the public would be misled by the proposed USDA seal on several key issues: 68% said they would interpret a product labeled "USDA Certified Organic" to be safer to eat than non-organic foods; 67% believed food with such a label would be better than non-organic foods; and 62% believed foods labeled that way would be healthier for consumers than non-organic foods.

Seven out of ten (69%) said the USDA label would imply these products are better for the environment and four out of ten (43%) believe these would be more nutritious.

US Official: GM Could Endanger Endangered Species

Rare US animals and wildlife could be threatened by transgenic fish and plants being developed in laboratories unless the federal government provides safeguards, a senior Interior Department official has said. Reuters reports that William Brown, a science adviser to Interior Secretary Bruce Babbitt, said the department was concerned that some new genetically altered organisms could inadvertently harm the environment, much like invasive plants.

Brown said some rare plants could be at risk if transgenic crops growing nearby inadvertently developed a generation of "super weeds." Likewise, pollen from fields of Bt corn could affect some butterfly species that are already dwindling in numbers, he said.

Canadian Wheat Board Against GM Wheat, Barley

The Canadian Wheat Board (CWB) has announced that it is against the production or importation of genetically modified wheat and barley varieties in Western Canada until there is a grain-handling structure in place to segregate such crops. The announcement came in anticipation of biotech wheat and barley varieties entering the commercial market in the next few years.

Since current grain handling technology "is not capable of efficiently and effectively identifying and segregating large volumes of transgenic grain," the paper concludes that modified wheat and barley "should not be registered for production in Western Canada."

Canadian Health Food Stores Revolt

After some Canadian food manufacturers began labeling their products as 'free of genetically modified ingredients,' the Canadian Council of Grocery Distributors implemented a new requirement for its members that such labels must have a sticker covering that information.

Canadian health food stores are refusing to comply with that edict, Canada News Wire reports "Canadians have a right to know what is in, or not in, the foods they buy," said Donna Herrer, president of the Canadian Health Food Association (CHFA). "We refuse to hide information from our customers by applying stickers over GM-free labels."

ACGA Explains Agenda

The American Corn Growers Association (ACGA) has submitted comments to the United States Department of Agriculture's Advisory Committee on Agricultural Biotechnology. The comments include sixteen recommendations which ACGA believes will "protect agricultural producers in this whole debate over genetically modified (GMO) crops."

International Patents (continued)

upstream of the 5' end of a plant DNA structural coding sequence that is transcribed at high levels in ripening fruit. This promoter region is capable of conferring high levels of transcription in ripening fruit tissue and in developing seed tissues when used as a promoter for a heterologous coding sequence in a chimeric gene. The promoter and any chimeric gene in which it may be used can be used to obtain transformed plants or plant cells. Chimeric genes including the isolated promoter region, transformed plants containing the isolated promoter regions, transformed plant cells and seeds are also disclosed.

EP 0974667 **Process to collect metabolites from modified nectar by insects** - Centrum Voor Plantenveredelings- En Reproductieonderzoek (Cpro-Dlo) - The invention relates to a recombinant double-stranded DNA molecule comprising an expression cassette comprising the following constituents: i) a promoter functional in nectaries of plants, ii) a DNA sequence encoding a protein which is fused to the promoter, iii) a DNA sequence encoding a signal peptide that targets the recombinant protein to nectar, which is translationally fused to the DNA sequence encoding the recombinant protein, and optionally iv) a signal sequence functional in plants for the transcription termination and polyadenylation of an RNA molecule. The invention further relates to a process for isolating and purifying the gene product from the honey.

WO 0003017 **Enhancer elements for increased translation in plant plastids** - Calgene Llc - Provided are methods for

International Patents (continued)

increasing the production of protein in a plant cell by transforming plastids of plant cells with a construct comprising a promoter functional in a plant plastid, a ribosome binding site, DNA sequence of interest and a transcription termination region, and growing plant cells comprising the transformed plastids under conditions wherein the DNA encoding sequence is transcribed in the plastid. Also provided are methods for increasing protein production by fusing a coding sequence to a gene of interest to a secondary protein for cleavage or targetting of the protein of interest within the plastid, whereby high levels of expression of protein is achieved.

WO 0003022 Expression of herbicide tolerance genes in plant plastids - Calgene Llc - Provided are constructs and methods for expressing herbicide tolerance genes in plastids of plant cells. Constructs include the components of a promoter functional in a plant plastid, a DNA sequence which is capable of conferring tolerance in a plant cell to at least one herbicide compound when said DNA sequence is transcribed in plastids of said plant cell and a transcription termination region. Herbicide tolerance is produced by transforming plastids with the constructs of the invention and growing plant cells comprising the transformed plastids under conditions wherein the DNA sequence is transcribed and plant plastids and cells containing the plastids are rendered tolerant to applications of at least one herbicide compound.

EP 0971578 Methods for Agrobacterium-mediated

The Committee was formed to advise USDA Secretary Dan Glickman on various issues regarding the use of modern genetics in crop and food production.

Gary Goldberg, CEO of ACGA says that many organizations, including the newly-operational Foundation E.A.R.T.H., have a "conflict of interest" preventing them from truly representing the interests of farmers, since these groups are funded by seed companies and other commercial interests. Much the same, he says, is true of the US Department of Agriculture, which he says helped develop 'Terminator' technology for the benefit of seed companies rather than growers.

Research News

Irish Biotech Research Centers Band Together

Large-scale and sustained investment in biotechnology is necessary if the Irish economy is to continue to maintain its dynamism, claims a new report on biotech research needs. According to *The Irish Times*, the report was published by a group of senior scientists in Irish universities and the state's agricultural research body, Teagasc. Ireland "must build as a matter of urgency a world-class research and development capability" in food biotechnology, the report concluded.

Scientists from Teagasc, UCC, UCD, TCD, NUI Galway and BioResearch Ireland, who compiled the report, suggest existing university-Teagasc research and development capability "is a sound strategic capability on which to build a world-class biotechnology capability".

Their evaluation of research priorities in agri-food biotechnology was called "a first major step by the agri-food research institutes in meeting the challenge of the [Government's] Technology Foresight initiative, which involves allocation of £560 million (\$871 million) for research in biotechnology and information technology."

The report suggests concentrating on the agri-food sector, including genetically modified crops, in light of a prediction that 70% of global biotech growth will be in this area.

China's First Bioinformatics Center Opens

China's first biological information research center has been established in Xi'An, at the Northwest Agriculture and Forestry University, *Xinhua* reports. The research center, now staffed by seven researching personnel and a number of postgraduates, appointed Professor Chen Shuxin, a Chinese American with a background in genetic engineering, bioinformatics, e-commerce and internet systems, as director and chief scientist.

Professor Shuxin said the center will focus on collecting, collating and researching the use of biological information, building an agricultural industrial network, providing services for commercial research projects and training professional personnel.

RNA Structure Revealed

Researchers at Stanford University have solved the structure of the RNA polymerase protein, one of the pivotal molecules in biology. The polymerase copies genes from DNA to RNA, which is an essential step in the transfer of information from gene to protein.

"It is arguably the most important protein in biology," said Roger Kornberg, PhD, professor of structural biology at Stanford University School of Medicine. "The structure provides the basis for understanding all gene activity in eukaryotic cells," said Kornberg, whose group's findings were published in *Science* magazine.

RNA polymerase II is the first apparatus in the production line from gene to protein. Its task is to faithfully copy regions of gene-containing DNA into strands of messenger RNA (mRNA). Once a gene has been copied into mRNA, the next step is production of the protein that is coded for by that gene. The protein-making machinery (the ribosome) uses the mRNA as a template for protein production, mirroring how the RNA polymerase enzyme uses DNA as a template for mRNA production.

The RNA polymerase enzyme actually consists of 12 separate protein subunits. Using data collected via the method of X-ray crystallography, researchers in Kornberg's lab constructed a model of how the individual subunits fit together to form the entire RNA polymerase complex.

"This is a machine with moving parts," said Kornberg. "We think that one of the important moving parts of this machine is the clamp that swings over the DNA," said Kornberg.

"Jaws," "clamp," and "funnel" are the names he and his collaborators have given to individual parts of the complex. Regions of three subunits combine to form a pair of pincer-like jaws that

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International Patents (continued)

transformation - Pioneer Hi-Bred International, Inc. - The present invention relates to methods for improving the transformation frequency of *Agrobacterium*-mediated transformation of maize embryos. A preferred method for transforming maize using *Agrobacterium* comprises the steps of: contacting at least one immature embryo from a maize plant with *Agrobacterium* capable of transferring at least one gene to said embryo; co-cultivating the embryos with *Agrobacterium*; culturing the embryos in medium comprising N6 salts, an antibiotic capable of inhibiting the growth of *Agrobacterium*, and a selective agent to select for embryos expressing the gene; and regenerating plants expressing the gene.

EP 0971580 **Regulatory element for expressing genes in plants** - Purdue Research Foundation - The present invention is directed to a novel promoter sequence for expressing genes in eukaryotic cells and the construction of expression vectors comprising that promoter sequence.

EP 0971603 **Artificial media for rearing entomophages** - The United States Of Americaas Represented Bythe Secretary Of Agriculture - An improved artificial diet or growth medium for rearing entomophages (predatory arthropods and parasitic insects). The growth medium is composed of a mixture of (a) an adherent, fibrous retention substrate, (b) a protein-lipid paste, and (c) a liquid, and provides nutrients in a stabilized form in amounts and proportions effective to support growth of entomophages. An exemplary formu-

trap the DNA near the gene that will be transcribed. The clamp portion of the molecule then swings over the DNA and locks closed, ensuring a tight coupling between the RNA and DNA.

Components for the growing mRNA strand enter the machinery through a central pore and funnel. The opening also serves as a waste portal for incorrectly transcribed mRNA. According to Kornberg, the enzyme is believed to be constantly testing the fidelity of the newly produced mRNA. "The enzyme has the capacity to move forward and backward, like a zipper. It backtracks when proofreading the message," he said. If an error is found, the faulty message is discarded through the pore before the enzyme resumes production of new RNA.

Multiple Promoters for Multi-Purpose Genes

In an article in the journal *Science*, researchers at the Howard Hughes Medical Institute (HHMI) report discovering that a gene can have more than one promoter, leading them to speculate that the mechanism might allow the same gene to be used for different purposes in different cells.

HHMI investigator Robert Tjian and graduate student Michael C. Holmes determined that the *Drosophila* gene tudor contains tandem promoter segments, one of which responds to TRF1.

"The discovery of TRF1 has been intriguing because for perhaps the last fifteen years we thought that the basal transcriptional machinery of the cell was essentially invariant," said Tjian, who is at the University of California, Berkeley. "We thought that only one set of "general" proteins was involved, and that all the regulation was directed by enhancer-binding proteins that were specific to a particular gene sequence.

The scientists had found evidence that TRF1 is apparently one of several alternate transcriptional control molecules — called recognition factors — that can replace the most prevalent control element, called TATA-binding protein, or TBP.

"While past studies had proven that TRF1 was involved in transcription, the big question was why was it particularly exciting just finding another TBP-like molecule," said Tjian. "But then research revealed, surprisingly, that this molecule was not evenly distributed in every cell. Some cell types... expressed high levels of this protein and others had either very low levels or none at all."

According to Tjian, the discovery of tandem promoters represents the opening of a new terrain for the exploration of transcription control. "Right now, trying to explain these tandem promoters is total speculation," he emphasized. "However, if you look at the genome of the fly, it's about 12,000 genes. In contrast, the roundworm, *C. elegans*, has about 18,000 genes. Now, the fly is at least as complex, if not more complex than the worm, and one way to achieve that higher complexity with fewer genes is to make the same gene-coding capacity more versatile. One way this versatility could evolve is by simply having more elaborate control mechanisms over a smaller number of genes." Thus, said Tjian, the same gene might be governed by alternate control schemes in different cells.

Tjian and his colleagues plan to look for other genes that have multiple controls and to explore further this newfound diversity of gene control.

'Golden Rice' Inventor To Receive Kumho Award

The Kumho Science International Award in Plant Molecular Biology and Biotechnology will be presented to Ingo Potrykus of the Swiss Federal Institute of Technology (ETH). The \$30,000 award, to be presented in Korea, is presented by the Kumho Group and Kumho Cultural Foundation of Kwangju, Korea.

The Kumho award is bestowed on Potrykus for his groundbreaking work in plant biotechnology. A notable achievement was his recent application of genetic engineering technology to produce rice lines that contain greatly enhanced levels of pro-vitamin A.

"This result promises to alleviate a major nutritional deficiency in hundreds of millions of people who are dependent on rice as a primary food staple," the award committee noted. "By making the improved rice freely available for distribution to subsistence farmers, he has provided a compelling example of the use of the technology in the service of humanity."

EC Funds SA Biotech

South Africa's Council for Scientific & Industrial Research (CSIR) is to receive European Union funding to take part in two international research projects to genetically improve two cereal crops that could have a major impact on nutrition and food safety in the developing world.

If maize yields continue to increase only at current rates over the next 10 years, Sub-Saharan Africa will be short 90 metric tons of grain by 2025, the South Africa *Financial Mail* reports.

The CSIR is the coordinator of the two three-year projects that include the University of Bristol, the Savanna Agricultural Research Institute in Ghana, the Weizmann Institute of Science in Israel, the Center for Plant Breeding & Reproduction Research in the Netherlands, the University of Zambia and the University of Rome, with funding from the European Commission of about R2 million (\$289,000).

One project is aimed at genetically raising the nutritional value of sorghum. This crop is unique in that it has adapted to semi-arid parts of Africa where it is often the major food of people and livestock. But its poor protein quality, in common with most cereals, contributes to malnutrition in these countries.

The second project involves the genetic enhancement of maize to improve food safety. Maize is often infected by the pathogen *Fusarium moniliforme* which reduces crop yields and produces mycotoxins that are poisonous to humans and animals. Scientists aim to develop maize with durable resistance to the pathogen by selecting maize with natural resistance to it and by introducing anti-fungal genes into the maize genome.

NAS Elects Two Plant Molecular Biologists

The National Academy of Sciences (NAS) has announced the election of 60 new members and 15 foreign associates from nine countries in recognition of their distinguished and continuing achievements in original research. Of those elected, two are plant molecular biologists: Steven Briggs, president of Novartis Agricultural Discovery; and Jeff Palmer, chair of the department of biology at Indiana University (Bloomington).

Election to membership in the Academy is considered one of the highest honors that can be accorded a US scientist or engineer. Those elected bring the total number of active members to 1,843. Foreign associates are non-voting members of the Academy, with citizenship outside the United States. The newest election brings the total number of foreign associates to 320.

The National Academy of Sciences was established in 1863 by an act of the US Congress, signed by Abraham Lincoln, which calls on the Academy to act as an official adviser to the federal government, upon request, in any matter of science or technology.

NAS Forms New Biofood Panel

A new panel of university biologists, food researchers and physicians appointed by the National Academy of Sciences (NAS) is meeting to begin studying biotechnology food issues.

The NAS' committee on Biotechnology, Food and Fiber Production, and the Environment,

NAS Committee on Biotechnology, Food and Fiber Production, and the Environment

Barbara Schaal (Co-Chair)
Harold Varmus (Co-Chair)
David A. Andow
Neal First
Lynn Frewer
Henry Gholz
Eric Hallerman
Richard Harwood
Calestous Juma
Noel Keen
Samuel Lehrer
J. Michael McGinnis
Sanford Miller
Per Pinstrup-Andersen
Vernon Ruttan
Ellen Silbergeld
Robert Smith
Allison Snow

intends to help identify emerging issues, and to oversee panels to address those issues, but it will not author consensus reports.

The new committee will hear presentations on transgenic fish, food safety monitoring, environmental testing and food needs of Third World nations. The 18-member group is headed by Barbara Schaal, professor at Washington University in St. Louis, and Harold Varmus, president of Memorial Sloan-Kettering Cancer Center in New York.

The committee was appointed after a separate National Academy of Sciences panel cautiously endorsed the safety of gene-spliced foods, but urged more research and long-term monitoring of health effects. The US Agriculture Department has already asked the permanent committee to review its regulations for approval of biotech crop field testing, and to recommend any changes that may be needed.

Reuters reports that the new group is also likely to take a close look at the FDA plan to formalize the pre-market review of new biofoods, develop voluntary labeling guidelines for foodmakers, and standardize scientific tests to detect tiny amounts of genetically-altered material in food ingredients.

The nominations to the NAS committee, which are subject to comment, are given in the accompanying table.

Conflicts of Interest May Endanger Research

Marcia Angell, editor of *The New England Journal of Medicine*, says an explosion of research funding from drug and medical-equipment makers has added commercial concerns to the scientific process. "When the boundaries between industry and academic medicine become as blurred as

lation is a mixture of adherent, fibrous cooked whole egg, ground beef and beef liver protein-lipid paste, and water. The growth medium is suitable for mass production of entomophages at a reasonable cost for use as biological control agents, and is well suited for rearing entomophages that feed by the process of extra-oral digestion.

EP 0972036 Prion propagation inhibition by dominant-negative prion protein mutants - Deutsches Krebsforschungszentrumstiftung Des Öffentlichen Rechts - The present invention relate to a vector which is suitable for gene prophylaxis/gene therapy, containing a nucleic acid fragment coding for a mutated prion protein. The invention further relates to a vaccination agent which contains said vector in addition to the usual auxiliary agents, and to the use of said vector or vaccination agent in the prophylaxis and/or treatment of prion diseases. The invention further relates to non-human mammals e.g., working animals, which are resistant to prion infections.

EP 0972061 Novel uses of male sterility in plants - Biogemma - The invention concerns novel uses of male sterility to improve the cultivation conditions of transgenic plants for man and environment.

EP 0972076 A method for identifying genetic marker loci associated with trait loci - E.I. Du Pont De Nemours And Company & Asgrow Seed Company - A novel method for identification of trait loci using genetic marker loci and the use of genetic marker loci as a selec-

International Patents (continued)

tion method in a plant breeding program is disclosed. The method comprises comparing genotypic survey data to phenotypic data collected from the same entries used to create the genotypic survey and identifying genetic marker loci that are associated with traits. The method allows new and superior plants to be identified and selected for in a plant breeding program by genotyping with identified genetic marker loci.

EP 0972445 **Pluripotent cells having disrupted intrinsic genes** - Kirin Beer Kabushiki Kaisha - A process for constructing a chimeric non-human animal characterized by preparing microcells containing one or more foreign chromosomes or fragments thereof, and transferring the one or more foreign chromosomes or fragments thereof into pluripotent cells through fusion with the microcells; chimeric non-human animals which can be constructed by the above process and offspring thereof; tissues and cells originating in the above animals; methods for using the individuals, tissues and cells of the animals; pluripotent cells containing one or more foreign chromosomes or fragments thereof, a process for constructing these cells, and the use of these cells; pluripotent cells in which at least two intrinsic genes have been disrupted; a process for constructing the above cells by homologous recombination; etc.

they are now, the business goals of industry influence the mission of medical schools in multiple ways," she cautioned in an editorial, headlined "Is Academic Medicine for Sale?"

As a remedy, she said major medical schools should adopt a strong, common code for conflicts of interest, banning some writing and speaking arrangements and stock ownership in companies making the products under study. She said drug companies should not promote products and offer gifts to students and doctors at teaching hospitals. And she suggested that researchers' consulting income could go into a common research pool.

Michael Werner, a lawyer for the Washington-based Biotechnology Industry Organization, said disclosure of financial ties and government regulation sufficiently protect the public. He said companies have every reason to shun poor research because of liability and the bad publicity that could result from a recall.

PLANTS ▼

Precision Plant Transformation Breakthrough

Chris Baszczynski and his colleagues have adapted a technique, originally developed for gene repair in mammalian cells, that employs chimeric oligonucleotides to introduce single base changes into DNA. Using this approach, *Nature Biotechnology* reports, they have successfully generated herbicide-resistant plants with just a single change in the genetic code.

Chimeric oligonucleotides consist of a short self-complementary stretch of double stranded DNA flanked by a longer stretch of RNA to protect it from degradation *in vivo*. The DNA sequence corresponds to the region of the gene to be modified, but with a single nucleotide change. When introduced into cells, the chimeric oligonucleotide homes in on the gene of interest with the matching sequence and then triggers the plant's own DNA repair machinery to substitute the oligonucleotide-encoded sequence with the single base alteration for the original plant sequence.

In previous work, Baszczynski's team used chimeric oligonucleotides to alter the gene encoding the plant enzyme acetohydroxyacid synthase (AHAS) in masses of plant cells called calli, which as a result acquired resistance to the broad-spectrum herbicide imidazolinone. However, it was not clear whether the results would be reproducible or long lasting in whole plants. In the new study, they regenerate whole transgenic plants from the calli and show that the modified AHAS gene is maintained in subsequent generations.

Root-Formation Gene Identified

In *Cell*, Philip Benfey of New York University reports identifying a gene that governs how plant cells proliferate and organize to form root systems. He found that the *Arabidopsis* plant's SHORT-ROOT (SHR) gene governs asymmetric cell division in the root's cortex and endodermis. In addition, Benfey found that the SHR gene governs the specific characteristics of the endodermis. By manipulating where in the plant the SHR gene was expressed, he and fellow researchers were able to manipulate the number of endodermal cell layers made in the root.

Benfey said, "Our findings have potential biotechnology applications and also implications for evolutionary biology."

"Our research findings might be used to improve such agronomic traits as tolerance for salinity and reliance on fertilizer. Because roots normally grow underground, it is very difficult to breed for roots that are best suited for a particular environment. The use of genetic engineering may provide a better means of addressing this problem."

From an evolutionary standpoint, it has been unclear how organs formed from very different cell division processes could end up with essentially the same tissues in the same places. Extending molecular research from *Arabidopsis* to roots of other species provides a unique system to understand the evolution of meristem organization both during embryogenesis and vegetative growth."

This research was funded by grants from the National Institute of Health.

Tomatoes Express RSV Vaccine

Schuyler Korban and colleagues at the University of Illinois are working on modified tomatoes which express a vaccine for respiratory syncytial virus, or RSV, which causes both pneumonia and bronchialitis. Because these diseases can severely affect newborns and infants, the UN has put RSV on its list of the top 12 most important viruses to pursue and develop vaccines for, according to Korban. "The idea is basically to use a fruit for delivering an edible human vaccine," Korban said.

Korban's team originally started the work with apples, because apples are widely grown, and available in many forms, some of which are very easy for babies to eat. They eventually decided that apples took too long to fruit, and they moved on to tomatoes.

Pollen-Blocking Technology Developed

A new technique developed at Kyoto University which prevents plants from developing pollen could allay fears that transgenes might endanger the environment, according to the *Nikkei Weekly*. The pollen-blocking technique disables the promoter which switches on the pollen gene

The new technique builds on the discovery of the promoter that activates the gene for an essential enzyme in pollen cells. The university group took this promoter, combined it with a sequence of anti-sense DNA which inhibits the activity of the gene coding for the enzyme, and incorporated it into a plant known as shepherd's purse.

Flower growers might find the technique useful because blooms last longer when they are not pollinated. And plant developers using conventional crossbreeding techniques to create new strains would undoubtedly like to work with plants that do not produce pollen, because that would save them the need to manually snip off the stamens.

Tobacco Could Produce HIV Vaccine

Genetically modified tobacco may soon produce a vaccine against the HIV virus, the Associated Press reports. Researchers at CropTech Corporation are working to genetically alter the plant to express a protein found in two strains of HIV. When the protein, gp120, is given in a vaccine, researchers say, it could prompt the body to develop a resistance to the disease.

The American Cancer Society welcomes new tobacco research. "If tobacco can be used to cure or prevent diseases instead of cause them, that would be fantastic," said Dr. Michael Thun, head of Epidemiologic Research for the American Cancer Society in Atlanta. Carole Cramer, a plant physiologist at Virginia Tech and co-founder of Blacksburg-based CropTech, said tobacco is an ideal plant for this type of research because it yields a million seeds per plant, grows quickly and is easy to harvest.

While the initial research looks promising, clinical testing of the HIV vaccine is years away, said David Radin, CropTech's president.

Chinese Scientists Develop Insect-Resistant Rape

Chinese scientists have developed a new strain of transgenic insect-resistant rape, according to *Xinhua*. This is expected to increase rape yield, minimize consumption of chemical pesticides and protect the environment.

Led by professor Guan Chunyun, a research group in the Hunan Agricultural University in central China spent four years on the project. China has the largest rape growing area and output in the world. However, insects are the major restriction to the increase of rape seed yield in China. In the middle reaches of the Yangtze River pests seriously damage the rape crop every year.

Tests showed that the new strain of rape can effectively resist worms and cause no pollution to the environment. Scientists will further study the safety and stability of the new rape strain and its influence to bees and pollination, according to Guan Chunyun.

ANIMALS ▼

Cloning Rejuvenates Senile Cells

Cells from six healthy cow clones show no signs of the premature aging reported for Dolly the cloned sheep, researchers say in a report in *Science*. In fact, the cloning process seems to have resulted in cow cells which on the molecular level seem younger than normal cows of the same age.

Robert P. Lanza of Advanced Cell Technologies of Worcester, Mass., and his co-authors on the *Science* paper say that they still don't know exactly how cloning helps these cells shrug off the signs of aging, or whether this translates into a longer lifespan for the animals themselves. Despite these unsolved mysteries, the finding erases a lingering doubt about the utility of cloned cells by demonstrating that the process doesn't automatically rob cells of a normal lifespan. In fact, say Lanza and colleagues, cloning could supply a crop of youthful cells for a variety of uses, from medical applications like designing and transplanting replacement tissues for the human body to increasing the breeding years of farm animals.

Calendar

June 2000

18-23 Cellular & Molecular Mycology Gordon Research Conference. Plymouth, NH, USA. *Contact Gordon Research Conferences, email app@grcmail.grc.uri.edu or visit www.grc.uri.edu/programs/2000/cellmyco.htm.*

18-24 6th Congress of the International Society for Plant Molecular Biology. Québec, PQ, CANADA. *Contact Congress Secretary, phone (418) 658 6755, fax (418) 658 8850, email dhagora@microtec.net or visit www.ispmb-2000.org/frameset1.html.*

20-22 Biobiz Training Course for Scientists on setting up a Biotechnology Company. Dublin, Eire, IRELAND. *Contact Michel Lepers, phone +33 473 64 43 36; fax +33 473 64 43 37; email michel_lepers@compuserve.com or visit <http://europa.eu.int/comm/dg12/biotech/biocour1.html>.*

20-24 World Conference On Bioethics, A World Wide Society for the Century of Bioethics. Gijón, SPAIN. *Contact Technical Secretariat, phone +34 (98) 517 6006; fax +34 (98) 517 5507; email congreso@sibi.org or visit www.bioetica.sibi.org.*

21 The Business of Biotech: Legal Issues in the Rush to Market. Bethesda, MD, USA. *Contact Round-table Hotline, (202) 828-0370, fax (202) 457-5160, email events@legaltimes.com or visit www5.law.com/dc/advertising/biotech_roundtable/biotech_ad.shtml.*

24-28 Arabidopsis 2000. Madison, WI, USA. *Contact Carol Grabins, phone (608) 265 6534; fax (608) 265 8299; email arabidopsis2000@union.wisc.edu.*

Calendar (continued)

edu or visit www.wisc.edu/union/info/conf/arabidopsis/arabidopsis.html.

24-28 Molecular Biology of Model Legumes. Norwich, UK. Phone +44 (01603) 593271, fax +44 (01603) 250585, email legume@uea.ac.uk or visit www.jic.bbsrc.ac.uk/events/elm-2000/.

24-28 39th Annual Meeting of the Society of Nematologists. Québec City, PQ, CANADA. Contact Guy Belair, phone (450) 346 4494, fax (450) 346 7740, email belairg@em.agr.ca or visit www.ianr.unl.edu/son/son_quebec2000.html.

26-28 Biolatina 2000. Buenos Aires, ARGENTINA. Contact María Marta S. de Mc Carthy, phone +54 (11) 4371 9912; fax +54 (11) 4371 0184; email info@foarbi.org.ar or visit www.foarbi.org.ar.

26-29 NZ Society of Animal Production Conference. Hamilton, NEW ZEALAND. Contact Steve Davis, email daviss@agresearch.cri.nz.

29-July 2 Symposium on Biosynthesis of Glucose Polysaccharides. Ames, IA, USA. Contact Plant Sciences Institute Symposia, phone (515) 294 7978; fax (515) 294-2244; email pmb@iastate.edu or visit <http://molebio.iastate.edu/~gfst/phomepg.htm>.

July 2000

1-6 Mammalian Gametogenesis and Embryogenesis. New London, CT, USA. Contact Gordon Research Conferences, email app@grcmail.grc.uri.edu or visit www.grc.uri.edu/programs/2000/mammgam.htm.

2-6 15th Australasian Biotechnology Conference.

Cells possess a finite number of division cycles, at the end of which the cell can no longer divide. To create the cow clones, the researchers used cells that were near the end of this lifespan, with only a few bouts of cell division left. Surprisingly, Lanza and the others discovered that the cloning process seemed to reset the number of division cycles. Instead of being zero to four division cycles away from the end of their lives, cells taken from the cows were more than 90 cycles away from their end.

By contrast, chromosomes from the cow sisters are the picture of youth. Telomeres from the clones are actually longer than those from normal cows of the same age, and in most cases even longer than those from newborn calves. Far from being prematurely aged, cells from the cow clones appear to have even prolonged their youth, lengthening their lifespan beyond that expected for their chronological age.

The *Science* authors suggest a number of reasons for the rejuvenation effect, including differences in cloning techniques. Rather than creating clones from cells at the end of their lifespan, as was the case with the cows, Dolly's creators used cells that had been starved and sent into a resting state. Differences in the original donor cells used — mammary cells for Dolly and fibroblast (connective tissue) cells for the cows — may also play a role.

"Previous studies have indicated that there may be variation in how different cell types repair telomeres, which could make the choice of donor cell significant," says Lanza.

Mammalian Eggs Demethylate Male DNA

Wolf Reik of the Babraham Institute in Cambridge and Biologists in Britain and Joern Walter of the Max Planck Institute for Molecular Genetics in Berlin have shown that mammal eggs can suppress expression of male genes — a discovery that could have important implications for cloning, according to *New Scientist*. Although embryos receive two copies of every gene, one each from the mother and father, the two are not always equally active. That is because many genes carry an "imprint," a series of chemical marks known as methyl groups. Usually this methylation inactivates the gene, but in some cases it can make it more active.

In 1991, biologists David Haig and Chris Graham of Oxford University proposed that imprinting evolved in a tug-of-war between the sexes to help both parents get what they want. "The paternal genes are more selfish and make bigger offspring," says Wolf Reik of the Babraham Institute in Cambridge, "but you can kill the mother if you grow too big."

Alan Wolffe, a biochemist at the US National Institutes of Health near Washington DC says understanding demethylation will also be critical for cloning research. As cells specialize, their methylation patterns change. Cloning can only work when the recipient egg somehow resets the donor DNA to an embryonic state. One of the main causes of failure in cloning is overgrowth of the embryo, as if paternal imprints were winning out.

Project To Decode Rice, Pig Genes

In an effort to learn more about two of the most important staples in the world's diet, the Beijing Genomics Institute (BGI) has announced that it will undertake two major projects to sequence the rice and pig genomes.

BGI will focus its first project on the super hybrid rice developed by Professor Yuan Longping at the National Center of Hybrid Rice Development in the Hunan province. The construction of the super hybrid rice genome will lay the fundamental groundwork for understanding the genetic structure of crops with larger genomes such as wheat, barley and maize.

The second project will concentrate on the Meishan pig, which is famous for its high reproductive rates. The first phase of the project will focus on producing a "working draft" of the pig genome by sequencing more than 90% of the cDNA. The genome draft will greatly assist the world pork industry in using modern genetic technology and tools to gain better breeding for efficient meat production, as well as with disease prevention and environmental-friendly industrialization.

Australians Unveil Cloned Calf

Scientists in Australia have unveiled Suzi, the country's first cloned calf produced through nuclear transfer. Announcing her birth, scientists said that the cloning technology could transform one of the world's biggest beef and dairy industries. "Technology is now starting to reach levels of efficiency where we're within five years of commercial reality," Ian Lewis told Reuters. "In five years time there would be hundreds, up to thousands of cloned animals, I would think. It's a big step forward for Australian agriculture."

Suzi, a black and white Holstein, was produced by joint research between the Monash University Institute of Reproduction and Development, Genetics Australia, the Victoria State Institute of Animal Science and the Dairy Research and Development Corp. The immediate aim is to produce higher protein milk from cloned cows, but the Monash group also plans to produce milk with pharmaceutical and special nutritional uses.

FOOD/INDUSTRIAL ▼

Modified Fungus Produces More PLA

In research at the ARS National Center for Agricultural Utilization Research, Peoria, Ill., microbiologist Christopher Skory isolated an enzyme called lactate dehydrogenase (Ldh) produced by the fungus *Rhizopus oryzae*. The amount of enzyme produced determines how efficiently the fungus can produce lactic acid. After researching the isolated enzyme, Skory cloned the gene responsible for Ldh synthesis and bioengineered the fungus to have multiple copies of the gene.

The modified fungus could make it possible to manufacture truly biodegradable plastic milk jugs and soda bottles and become a “workhorse” in converting grain and other renewable agricultural resources into environmentally friendly solvents and plastics.

Even before the new improved strains came about, the emerging PLA industry was using *R. oryzae*, because it produces lactic acid with uniform quality that’s superior to a mix of lactic acids from bacterial fermentations, Skory says. *Contact Skory at phone (309) 681-6275, fax (309) 681-6567, email korycd@mail.ncaur.usda.gov.*

Bacteria Inhibit *E. coli*

Nutraceutix, Inc., of Redmond, Wash., has announced the development of Cobactin E, a proprietary strain of the bacteria *Lactobacillus acidophilus* which has been shown to inhibit the highly pathogenic *Escherichia coli* strain O157:H7 *in vitro*.

In laboratory studies, *L. acidophilus* strain 1386-1 eliminated 99.29% of *E. coli* O157:H7 in cultured media, according to Tanya Turner, head microbiologist at Nutraceutix and developer of the strain. *L. acidophilus* is an enrichment component of milk, yogurt and animal feeds as well as a common health supplement. Nutraceutix last year announced the development of a strain of *Lactococcus lactis* shown in laboratory studies to be inhibitory to *Listeria monocytogenes*, the primary pathogen associated with Listeria food poisoning.

BioFeature

Activists Create Alternative News Source For Farmers

A coalition of trade and activist groups has banded together to form CropChoice, which intends to act as “an information source for American farmers about genetically modified crops, alternatives, management options and profitability.” As stated on its website at www.cropchoice.com, its focus is on disseminating “news that big companies may not want farmers to hear.”

Calendar (continued)

Brisbane, AUSTRALIA. *Contact Conference Secretariat, phone +61 (7) 3858 5486; fax +61 (7) 3858 5510; email aba2000@im.com.au; or visit www.aba2000.im.com.au/.*

2-6 14th International Congress on Animal Reproduction.

Stockholm, SWEDEN. *Contact Hans Gustafsson, phone +46 1867 1000, fax +46 1867 3545, email Hans.Gustafsson@og.slu.se.*

2-6 Australasian Biotechnology Conference.

Brisbane, AUSTRALIA. *Contact Greg Harper of CSIRO at phone +61 07 3214 2441, fax +61 07 3214 2480, email Gregory.Harper@tag.csiro.au.*

2-7 IV International Symposium on In Vitro Culture and Horticultural Breeding.

Tampere, FINLAND. *Contact Seppo Sorvari, phone +358 (21) 4772 204, fax +358 (21) 4772 299, email seppo.sorvari@mtt.fi or visit www.elvi.com/fennohort/easyweb.asp.*

2-7 Mammalian Gametogenesis & Embryogenesis.

New London, CT, USA. *Contact Gordon Research Conferences, phone (401) 783 4011, fax (401) 783 7644, email grc@grcmail.grc.uri.edu or visit www.grc.uri.edu/.*

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Calendar (continued)

3-6 Algal Biotechnology in the New Era, The 4th Asia-Pacific Conference on Algal

Biotechnology. Hong Kong, CHINA. *Contact International Conference Consultants, phone + 852 2559 9973, fax + 852 2547 9528, email algae@icc.com.hk or visit www.hku.hk/botany/algae.*

3-7 Potatoes 2000: Breeding Research for Resistance to Pathogens and for Quality Traits.

Radzikow, POLAND. *Contact J.E. Bradshaw, (SCOTLAND), phone +44 (01382) 568 524, fax +44 (01382) 562 426, email JBrads@scri.sari.ac.uk.*

CropChoice says its news service “provides balance, complementing other news sources and helping American producers make the best planting and management decisions.”

CropChoice does not accept any seed or chemical company advertising. “Farmers have lots of well-justified concerns about biotech crops,” Ellen Hickey of Pesticide Action Network, North America, a member of the CropChoice coalition, told AgWeb. “With worldwide resistance to biotech crops on the rise, farmers need to know what the future has in store. CropChoice aims to provide that information and offer farmers an alternative to slick biotech ad campaigns.”

Whether news disseminated by such a coalition will help clarify matters for farmers is not immediately apparent.

Many of the supporters have obvious financial interests in the direction of the so-called “debate” over biotechnology. Demeter offers a certification service for organic farms using a ‘Biodynamic’ philosophy of agriculture which it claims is “widely regarded as the strictest and purest of all agriculture certification standards.” Family Farm Defenders is a group of dairy operators working to “put the control of milk pricing back into the hands of dairy producers.” One of its fundraising strategies involves promoting, and selling, “rBGH-free cheese products” to consumers.

For other members of the coalition, however, such as Greenpeace, their main business is activism. Sustain says it is “playing a key national role in mobilizing major public opposition” to biotechnology, and takes credit for organizing a Rally to Stop Genetically Engineered Foods in the federal plaza adjacent to the November, 1999 hearing of the Food and Drug Administration held in Chicago...

Read the rest online at www.bioreporter.com.

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