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Announcement

Plant Genetic Engineering Study Sets Timetable for Improvements

A leading seed and plant science consulting firm has recently completed a three-year in-depth study of the impacts of genetic engineering on 28 key crops. Crop and seed value increases for the 10 most important species are detailed, together with a timetable for commercialization.

L. William Teweles & Co. from Milwaukee, Wisconsin conducted more than 400 interviews with agricultural experts, scientists and business persons around the world in reaching the conclusions contained in the 700-page report, The New Plant Genetics.*

The New Plant Genetics is a group of new technologies, principally plant tissue culture and recombinant DNA, applied to improving crop performance. They offer the single greatest potential for nonconventional improvement of crop productivity because it enables scientists to transfer positive traits in one plant to a completely different plant species. The new plant genetics permits the overcoming of barriers that now prohibit crossing two different species. In addition to application of these technologies for quantum leaps in food and fiber productivity, the new plant genetics will make conventional plant breeding more efficient. Rapid methods for selection and testing of improved crop varieties will shorten dramatically the six-to-12-year period now needed by traditional plant breeders to create a new commercial variety.

Seed is still the envelope in which genetic improvements are delivered to the farmer. Without seed, substantial social benefits, revenues and profits from the new plant genetics could not be attained. Conventional plant breeding, seed production and seed marketing practices insure that traits introduced by the new plant genetics are of practical and economic benefit to farmers under actual field conditions.

Improved seed also can be protected legally. "Seed companies perform many major functions in bringing the new plant genetics to the marketplace", commented John Kaiser, Senior Consultant at Teweles. "In addition to testing, multiplying and marketing improved seed, seed companies help set new plant genetic research objectives and provide the commercial interface between the laboratory and the farmer's field."

The new plant genetics is expected to add $ 5.6 billion to the annual value of crops before the year 2000. After 2000, the added crop value from new plant genetics improvements will skyrocket to $ 20 billion annually.

Like crop values, the value of seed will increase dramatically. The annual retail value of all U.S. seed incorporating improvements from the new plant genetics will rise from about $ 8 million in 1985 to $ 6.8 billion by the year 2000. The represents a 57% annually compounded growth rate.

Eighty-five percent of the estimated commercial impact of new plant genetics-improved seed is expected in major crops, in advanced countries. These crops include:

– Wheat	– Corn	– Rice
– Barley	– Sorghum	– Soybeans
– Alfalfa	– Cotton	– Tomato
– Sugarbeet		

These 10 crops represent 80% of annual retail seed consumption value in 11 countries:

– United States	– Canada	– Japan
– Australia	– France	– West Germany
– Denmark	– The Netherlands	– Italy
– Spain	– United Kingdom	

These countries represent 90% of annual retail seed consumption in the developed free world.

While many crop-specific problems are still being researched, some improvements of the new plant genetics are in development now. "Tissue culture is now being used routinely to select for attributes in tomatoes, tobacco, potatoes and sugarcane", said Dr. George Kidd, Teweles' Advanced Science Consultant. "However, more complex modifications in crops such as corn, wheat and cotton await further refinements in recombinant DNA technology. Some modifications will be field tested starting in the late 1980s. The rate of application will vary by crop."

* The report has been written for industrial companies and sells for $ 30,000.00 a copy.
More information: L. William Teweles & Co. 777 East Wisconsin Avenue, Milwaukee, Wisconsin 53202, USA. Tel. (414) 2 73-48 54, Telex 260 311

Genetic research timetable for key crops – Predictions of a three-year, multi-client study [a]

	Identification, duplication and modification of agriculturally important genes	Routine growth of plant tissue in laboratory culture conditions	Growth of first genetically transformed whole plant	First plants altered by new technology available to breeder for commercial production	Growth of transformed plants on a routine basis
Major cereals					
Corn	now (zein, early maturity genes)	now	early 1990s	now	mid-1990s
Wheat	1985 – 1987	now	early 1990s	1984 – 1986	mid-1990s
Rice	1985 – 1987	now	lat 1980s	now	early 1990s
Barley	now (hordein, powdery mildew resistance genes)	now	1986 – 1988	1985 – 1987	early 1990s
Sorghum	1987 – 1989	1984 – 1986	early 1990s	1988 – 1990	mid-1990s
Oil seeds					
Soybean	now (nitrogen fixation genes)	now	early 1990s	1988 – 1990	mid-1990s
Oil palm	1988 – 1990	now	late 1990s	now	after 2000
Sunflower	1985 – 1987	1984 – 1986	now	1984 – 1986	1986 – 1988
Oilseed rape	1984 – 1986	now	late 1980s	now	early 1990s
Forages					
Alfalfa	1986 – 1988	now	1985 – 1987	now	early 1990s
Red clover	now (nitrogen fixation genes)	now	early 1990s	now	mid-1990s
Vegetables					
Tomatoes	1984 – 1986	now	1983 – 1985	now	1986 – 1988
Lettuce	1985 – 1987	now	late 1980s	1983 – 1985	early 1990s
Cucumer	1986 – 1988	1983 – 1985	mid-1990s	1985 – 1987	late 1990s
Onion	1986 – 1988	1984 – 1986	early 1990s	1984 – 1986	mid-1990s
Potato	now	now	1983 – 1985	now	1986 – 1988
Carrot	1983 – 1985	now	1983 – 1985	now	1986 – 1988
Beans	now (phaseolin)	1984 – 1986	1986 – 1988	1985 – 1987	early 1990s
Peas	now (vicilin, legumin)	1984 – 1986	mid-1990s	1985 – 1987	late 1990s
Brassicas	1983 – 1985	now	late 1980s	now	early 1990s
Grasses					
Kentucky Bluegrass	late 1980s	1985 – 1987	mid-1990s	1986 – 1988	late 1990s
Orchard-grass	late 1980s	1985 – 1987	mid-1990s	1986 – 1988	late 1990s
Woody plants					
Fruit, nut and ornamental trees	mid-1990s	1986 – 1988	late 1990s	early 1990s	after 2000
Forest trees	mid-1990s	now	lat 1990s	early 1990s	after 2000
Specialty crops					
Sugarbeets	1985 – 1987	now	early 1990s	1987 – 1989	mid-1990s
Sugarcane	1987 – 1989	now	early 1990s	now	mid-1990s
Cotton	1985 – 1987	now	early 1990s	1983 – 1985	mid-1990s
Tobacco	now	now	1983 – 1985	now	1986 – 1988

[a] Source: L. William Teweles & Co.