Future crop improvement means more basic research

BELTSVILLE, Md. — Future increases in crop production in the United States depend upon knowledge of fundamental plant processes, said Gerald G. Still at a recent science writers briefing held during USDA's Symposium in Agricultural Research, "Strategies in Plant Reproduction."

A basic understanding of plant development is already resulting in increased production, said Still, a plant biochemist with USDA's Science and Education Administration.

For example, plant hormones are now used to increase yields of sugar cane and grapes. Synthetic fruit-thinning agents prevent overloading of fruit trees with many small fruit. Harvest-aid chemicals hasten the natural maturation processes of potatoes and cotton. By altering the natural photoperiod, flowering of ornamental crops can be timed for peak market need, he said.

Future research could offer more information about how the time of flowering affects yields. If flowering of crops could be better planned, their fruits or seeds could develop during the best growing season, and in concert with the market. If fertilization of flowers could be synchronized, the entire growth cycle could be shortened, resulting in less exposure of the crops to weather and pests.

"This type of control depends upon an understanding of the regulation of basic processes in the plants," said Still.

Future increases will also be made by choosing desirable characteristics of certain crop varieties, and manipulating plant reproduction to favor these characteristics, observed Still. Some characteristics which have potential for increasing productivity are photosynthetic activity, nitrogen-fixation, and resistance to biological and environmental stresses.

As an example, one current limit to soybean productivity is the short-day control of bean development. If day-neutral soybeans could be developed, soybeans could be grown more effectively in northern and southern regions. Yields of wheat, oats, barley, corn, flax, and cotton could be improved by controlled maturation, or maturity to fit the growing period.

Cross-breeding, to be successful, is limited to closely related species, explained Still. New techniques of molecular biology (genetic engineering), combined with tissue culture propagation, could result in unique new gene combinations for improved crops. These techniques eliminate some of the natural barriers to crop improvement.

Also, the development of vehicles for gene transfer may be a technique for transferring desirable traits, like disease resistance or nitrogen-fixing capability, from one type of plant to another, he said.

Hereford association slates field day

ROSELAND, Va. — The Mid-Atlantic Hereford Association has announced a field day to be held July 11 at Blue Ridge Herefords (Flat Farm), Roseland, Va.

Activities will begin at 8 a.m. with registration. A live animal evaluation contest will be conducted for 4-H, FFA and other interested individuals and teams. Classes will include pens of bulls and heifers.

John Howarth, Cleveland, Ms., vice president of the American Hereford Association, will discuss how the new grading standards will increase the potential of the Hereford breed.

Craig Ludwig, AHA director of research and TPR, will comment on the National Reference Sire Evaluation Program and its changes toward the beef cattle industry.

"A.I., Extrus Synchronization and its Possibilities" is the topic to be presented by Norman Vinsel of Select Sires, Inc. Other special guests will include Jim Lodoen, American Junior Hereford Association vice president from Westhope, N.D., and Ed Brown, Blakeley Herefords, Berryville, Va. Brown will speak about fitting and showing cattle.

Blue Ridge Herefords at Flat Farm, Roseland, is located at the foot of Blue Ridge Parkway, 40 miles northwest of Lynchburg, or 50 miles southwest of Charlottesville, or 15 miles west of Amherst. Blue Ridge Herefords is now in their twelfth year of operation and consists of some 75 cows of Line-one and Sam Donald breeding.

The general public is invited to attend.