

USDA Researchers Plan

Barley Hybrids May Be Coming

A pain to make barley the third cereal crop — after corn and grain sorghum — grown from hybrid seed has been proposed by a USDA scientist

It could mean a 25-percent increase in barley plant efficiency—about the same gain that hybrid vigor gave corn and sorghum

Key to success is the barley plant—not yet discovered—in which two genetic traits are closely linked on one chromosome in the nucleus of each reproductive cell. These special traits — male sterility and resistance to DDT insecticide — occur naturally in some barley varieties

A plant with the close linkage of these traits is being sought in USDA's world collection of barleys, and breeding research to get this linkage is also under way. Since both traits occur frequently in nature, chances of finding the plant are reasonably good, according to the originator of the plan, agronomist G. A. Wiebe. He is head of ARS barley research at USDA's Agricultural Research Center, Beltsville, Md.

An additional requirement for success of the plan is the development of mechanized production procedures. They are necessary because of the large amount of barley seed needed to plant each acre. About 25 million bushels (twice that needed for corn) are required annually for barley plantings in the U.S.

Assuming that a plant is found with good linkage of male sterility and DDT resistance, another preliminary step is required—choosing 2 varieties with outstanding agronomic characteristics that will combine well in the hybrid. One variety would serve as the female or seed parent of the hybrids — the other, the male parent.

Four Steps are Involved. Wiebe outlines his proposed four-step breeding method this way:

1. Transfer traits by backcrossing into the barley chosen as female parent of the hybrids. The resulting progeny would then be crossed back to the chosen variety a number of times.

2. Seed from the first and second generation or the last backcross would be sown in alternate rows. Seedlings in the second-generation rows only would be sprayed with DDT. This would kill all the plants except resistant to the chemical. Surviving plants

step 3 and with the variety chosen as the male parent.

Since barley is normally self-pollinating, the degree to which the plants in alternate rows would cross-pollinate is unknown. It is expected that air currents would be sufficient to carry pollen from fertile to sterile plants.

Male sterility was discovered in some barley varieties in 1940 by C. A. Suneson, ARS plant breeder stationed at the California Agricultural Experiment Station, Davis. Such barleys produce no pollen, but the female part of each plant is normal and will set seed when fertilized. Barley normally has male & female parts in each flower and is self-pollinating.

In 1959, British researcher J. D. Hayes at the Plant Breeding Station in Wales

would be pollinated by plants in the unsprayed, first-generation rows. Only seeds from the sprayed rows would be harvested.

3. Seed obtained in step 2 would be sown in rows. Seedlings in alternate rows would then be sprayed with DDT, leaving a pure stand of resistant, male sterile plants. These plants would be pollinated by plants in the unsprayed rows. Seed again would be harvested only from plants in the sprayed rows.

4. Hybrid seed would be

to DDT insecticides — some are killed and others resist the chemical.

Hybrid vigor — the phenomenon in which increased vigor is found in the progeny from a cross of plants differing in genetic constitution — has already been utilized successfully in corn, grain sorghum, onions, sugar beets, and other crops.

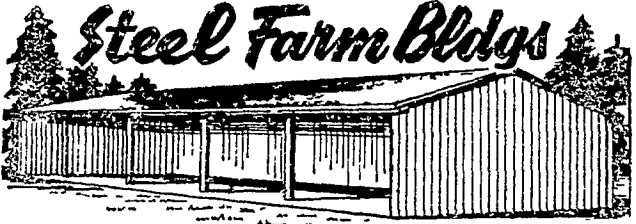
To kill Canada or bull thistles, George Berggren, Penn State extension agronomist, recommends spraying with amino triazole, at the rate of 4 pounds per acre in 20 to 50 gallons of water.

collars of dresses and blouses and collars of men's shirts usually need special treatment before laundering. Bernice Tharp, Penn State extension clothing specialist, suggests treating these areas with a liquid detergent working it well into the fabric, then washing the garment in the usual way. It is advisable to use the same detergent for spotting and washing.

LAST WORD

When it comes to home rule dad may be the chief executive, but mother is usually speaker of the house.

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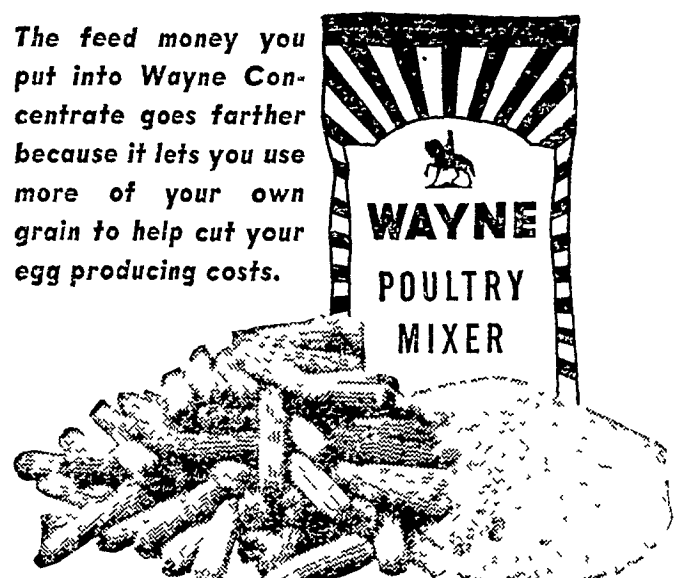
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