

New Crops

New strains and hybrids are adapting previously obscure crops to U. S. conditions so well that some specialties are reaching a new level of importance

COTTON, CORN, WHEAT, RICE, and potatoes aren't likely to lose their places of importance in American agriculture, but some new seed and root crops are gaining positions that deserve notice. Some of the plants growing on hundreds of cultivated acres in the U. S. today were hardly found outside botanical gardens in this country only a few years ago. To most Americans of the previous generation, sesame was something out of "Ali Baba and the Forty Thieves" and cortisone yams didn't exist.

Four decades of sorghum breeding by the Texas Agricultural Experiment Station have already paid handsome dividends, but more is yet to come from this work. A few years ago the discovery of a cytoplasmic male sterile character gave plant breeders a method of developing parental hybrid seed stocks, which will be in the hands of seed growers next year. Hybrids, with 20 to 40% greater yields than ordinary varieties, are scheduled to be ready for farm production by 1957.

Texas farmers, who produce 58% of the nation's grain sorghum, stand to gain some \$25 million in added income per year when hybrids take over a large part of the state's 5.5 million harvested acres. Hybrids, they say, have more vigor, come up to better stands than pure varieties, and stand up better for combining.

Some years ago, the station produced combine-harvesting types of grain sorghum which paved the way for Corn Products to build a starch processing plant at Corpus Christi. The company is now making starch, dextrose sugar, and other by-products from some 7 million bushels of sorghum a year. And other concerns are manufacturing sorghum flour or sorghum grits for industrial use.

Grain sorghum has become the principle grain cereal crop grown in Texas, surpassing both wheat and corn, and often exceeding the combined production of wheat, corn, oats, barley, and flax. But the station keeps on developing new varieties. Agronomists are now working with a variety that has a yellow endosperm character (acquired



Double dwarf—a new variety of sorghum recently distributed by the Texas Station. Development of new varieties adapted to U. S. climatic conditions are bringing about a type of agricultural revolution

from Africa). This sorghum also contains vitamin A and is similar to yellow corn.

Before very long the station hopes to have a variety which will be small-growing, fine-stemmed, and early maturing, that can be grown and harvested like wheat. Stubble from the grain-grass strains would cover the ground rather completely after the grain is harvested, just what is needed to help prevent wind erosion.

Sesame

The South needs a new oilseed crop to supplement cottonseed crushing operations, and sesame seems to be filling the bill. Many tons of the seed are consumed annually in the manufacture of bread, candy, and cookies. Sesame cake or meal also makes an excellent high-protein livestock feed. Both the seed and the oil will keep for several years without becoming rancid.

Palmetto, a new nonshattering variety, was released this year by the South Carolina Agricultural Experiment Station after 12 years of research. Palmetto seed yields range from 300 to 1000 pounds per acre, with an oil content of about 48% and a protein content of about 28% (55% crude protein in the meal). The Texas Agricultural Experiment Station recently developed a second nonshattering variety, Rio, now available to farmers in the southwestern states.

Texas had the first commercial plantings of sesame in 1953, from seed developed by the Texas Research Foundation at Renner. Although only 1000

acres were harvested the crop amounted to 420,000 pounds. Half of the crop went to the Frito Co. in Dallas, and the rest to the bakery trade. Last year Texas farmers in more than 50 counties harvested 7000 to 8000 acres—a crop of 1.2 million pounds. Half of the 1954 crop was marketed to bakers in the U. S.; the rest was exported to foreign crushing mills at 9.6 cents a pound, a total income of \$115,000. The Texas Sesame Seed Growers manager says that 12,000 acres will probably be planted during 1955. A big increase of irrigated acreage in this planting should give a crop approaching 5 million pounds. The U. S. baking trade will probably take 1 or 2 million pounds, but growers are confident they can dispose of the crop in other markets.

Rio and Palmetto sesame are also stirring up interest on the West Coast; Producer's Cotton Oil at Fresno, Calif., is sponsoring research on a nonshattering irrigated type of sesame at Fresno State College. Some 500 acres of sesame were raised last year in the area between California and Arizona, with yields ranging up to 1800 pounds of seed per acre.

Safflower for Oil

Big consumers haven't shown a great deal of interest in safflower because plantings have always been small. The market could probably take 1000 tank cars of oil, but it will have to be filled slowly in order to eliminate large financial risks on the part of the processor.

This year Pacific Vegetable Oil has contracted for about 54,000 acres of safflower in California and 7300 acres in the Pacific Northwest. West Coast crops, they say, will yield an estimated 21,000 tons of seed, 350 tank cars of crude oil, and 21,000 tons of by-product meal. The rest of the U. S. will probably have a planting of about 10,000 acres.

Safflower must compete against barley and wheat for acreage on the West Coast. Barley has been a better price support structure, but safflower supports this year compare more favorably. Wheat acreage restrictions have helped ease the competition for acreage. More interest on the part of large oil consumers would help the industry's ability to increase plantings.

Cortisone from Yams

Horticulturists at LSU say that a Mexican plant, from which cortisone can be made, will grow well in Louisiana. Known as the cortisone yam, it looks like a diffused cactus. Although the plant is inedible, valuable chemicals are concentrated in its roots.

"It is a potential new cash crop for the state and we have found that it will stay

in the ground all winter without decaying, allowing the farmer to harvest it at his own convenience," says Julian Miller, head of horticulture research. He indicated the yam contains more of the compound (5%) from which cortisone is made than any other plant found in a recent world-wide USDA search for plants beneficial to health.

The plant was brought to the LSU Experiment Station three years ago; horticulturists are attempting to improve its productivity by breeding and selection. University researchers have grown almost 500 seedlings, and have reduced this number to 20 promising varieties.

Yams already produced at LSU weigh as much as one pound, but the search continues for a seedling capable of producing two-pound yams each season. Planting stock will not be made available to the public for at least two years, until further research can be completed, but several drug companies have already indicated they would be interested in establishing cortisone extraction plants in Louisiana.

Nonmuriate Potash Salts

Potassium chloride remains major potash salt, but there is a place for other forms

WHILE POTASSIUM chloride accounts for most of the potash fertilizer used in the United States, there is an increasing interest in other forms of potash for certain applications. Sulfate, now supplying between 5 and 10% of the total, is the second most important potassium salt, and except for some imported nitrate is the only other salt of any real commercial importance at present. Three U. S. companies are producing potassium sulfate to satisfy the rising demand. One of these, International Minerals and Chemical, has recently increased production by 40,000 tons per year to reach a level of 150,000 tons. A similar increase was accomplished the previous year, and plans have been made for future expansion when demand requires it.

Traditional use of the sulfate has been for crops (such as tobacco) where chloride toxicity is a problem. Potatoes, whose increases in yield from fertilizer application are unfortunately combined with some quality reduction in the form of low starch content, show much better results when potassium sulfate rather than chloride is used. In California the sulfate is used for fruit and nut crops.

In Michigan sulfate shows promise for use in sour cherry orchards, while in New York State an improvement in grape quality has been indicated. Sweet potatoes and a number of other vegetable crops are good prospects for potassium sulfate salesmen.

In the Midwest there have been indications of chloride toxicity in corn treated with starter fertilizer containing potassium chloride. Attack on this problem so far, however, has consisted not of using non-chloride forms of potash, but of applying potash once or twice in the crop rotation cycle and keeping it out of the row. There is still a possibility of applying part of the potash in the starter mixture as sulfate.

Potassium salts whose anions are useful plant nutrients instead of the more-or-less useless, or occasionally even toxic, chloride would be very desirable in many cases, provided their prices were sufficiently low. Potassium nitrate is such a salt. Agronomically it might be ranked at the top of the list of potash salts, but its high price generally confines it to home garden formulations. The nitrate as well as some of the phosphates, should also be useful in liquid fertilizers, where it is desirable to keep salt content as low as possible to decrease salting out.

If available at low enough price, potassium carbonate would also be quite desirable in liquid fertilizers because of its high solubility. With muriate a 6-6-6 complete liquid fertilizer is about the highest analysis obtainable without risk of salting out. Using potassium carbonate this could be raised to perhaps 12-12-12. In an acid mixture the carbonate would be decomposed and

carbon dioxide would be given off, lowering the salt content while keeping the nutrient content the same.

International Minerals and Chemical is currently developing a low-cost process for making carbonate, and expects to be in production within four or five years—perhaps sooner. The company expects the product to be well accepted for a variety of applications because of its high K_2O content and lack of any toxicity, but several problems remain to be investigated. For example it is not known what effect the presence of carbonate might have on ammoniation procedures for preparing mixed goods. Like ammonium nitrate, potassium carbonate also needs some conditioning treatment to prevent caking.

Potassium metaphosphate has been produced on a pilot scale by TVA. There has been some interest shown in this material, even though for all practical purposes it is insoluble.

The double sulfate of potassium and magnesium is sold for soils having a magnesium deficiency. This salt is found in nature as langbeinite, which is also used to prepare the sulfate by base exchange with sylvite (potassium chloride).

Potassium chloride, since it is the most commonly found natural potassium salt, will probably continue to be the basic potash fertilizer material. Conversion to other salts is usually too expensive to give products priced low enough for general use. However, as fertilizer application and manufacture become more specialized, there will be a growing market for potash salts other than the muriate.

Shell Weedkiller Eradicating a Floating Menace in Ceylon

Before and after pictures from Ceylon where a water weed called salvinia is threatening agriculture and health by choking up paddy fields, irrigation canals, streams and reservoirs. Shell Petroleum Co., Ltd., has developed a weedkiller, being sprayed from a pontoon-floated tank, of pentachlorophenol, and wetting agents in an oil emulsion. Because of the density of the foliage 10 gallons of the weedkiller and 190 gallons of water have to be sprayed on every acre. A second spraying may be necessary to achieve results shown on the left. The Ceylon government is considering a five-year program costing about \$210,000 a year to eradicate the weed

