



LEFT TO RIGHT are, 1—Front view of tractor-mounted castor bean harvester manufactured in Arizona; 2—Side view of same machine; and 3—Normal size plant of U. S. Hybrid 415 and, at its right, ← the dwarf castor bean plant which is only four feet high. The present breeding program seeks to develop a high-yielding dwarf castor bean which can be easily machine-harvested.

## CASTOR BEANS FOR ARIZONA?

### Scientists Designing New Machines, Smaller Plants to Meet Our Needs

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Castor beans and castor oil have been used by man since Biblical times. Most of us are familiar with castor beans grown as ornamental plants and with castor oil sold in the drug stores, but today castor oil is in great demand for many industrial uses. It is used in the manufacture of such products as lubricants for jet planes, hydraulic fluids, paints and varnishes, nylons, plastics, soaps and lipstick.

After World War II, it was realized that castor oil would be a critical material in any future national emergency. Therefore, the U. S. Department of Agriculture has promoted their production. Today the United States consumes nearly half of the world's supply but produces less than 5 per cent.

#### Acreage in Arizona

In 1951 approximately 3,000 acres were planted to castor beans in Arizona. The varieties planted were not shatter-resistant and the mechanical harvesters were very inefficient. Consequently, field losses were great.

During the following four years the acreage dropped to as little as 200 acres. In 1956, about 2,000 acres were raised in the Salt River Valley and in 1957 over 5,000 acres were raised in Arizona. The outlook for 1958 is for even greater in-

creases. Two reasons for this comeback are improved varieties of castor beans and development of better harvesters.

#### Special Harvesters Devised

Because regular grain combines cannot be used to harvest castor beans, special harvesters have been developed by the U. S. Department of Agriculture and private companies. Two types of harvesters have been designed, the stripper-type and the combine. Early models were inefficient, but repeated redesigning and experimentation have developed more efficient machines in the last two years.

The new models are built on the principle of the stripper-type which has been more efficient than the combine types, especially in tall castors. Early models of the harvesters only removed the capsules from the plants and the hulling operation was done with stationary hullers. Today's models are harvester-huller machines performing both operations in the field.

#### Improved Varieties Available

The recent success of castor beans would have been impossible without improved varieties. During the past ten years USDA and private seed companies have developed new and better varieties of castor beans. Most important is development of hybrid varieties and more recently dwarf varieties.

Since 1952 University of Arizona agronomists in cooperation with USDA have had variety tests at the various experiment stations in Arizona. On the basis of these tests, we recommend U. S. Hybrid 415 and Pacific Hybrid 6 for Arizona. It was with these two hybrid varieties that castor bean production was revived in Arizona in 1956 and 1957.

In 1957 the UA Department of Agronomy and Range Management has expanded its castor bean research to include a breeding program as well as variety tests. This is directed toward developing varieties more adaptable to Arizona conditions. Special emphasis will be given to the development of dwarf varieties which are more adaptable to efficient harvesting. No dwarf varieties are now available which will yield as well as the taller varieties.

#### Growing Castor Beans

Castor beans grow best in loam to sandy soil similar to cotton. They should be planted on beds and irrigated between the row. Less water than for cotton is required, although the timing of irrigation applications is important. During extremely hot weather in the summer, irrigations should be frequent enough to maintain good moisture and humidity conditions to avoid excess blasting of flowers. This can be accomplished by irrigating every week but irrigating every other row at a time. Fertilizer requirements are average requiring about 80 to 100 pounds of nitrogen in split applications.

Castor beans are planted in the spring after the soil warms up and are harvested in the fall after frost defoliates them. At lower elevations they have yielded best when planted in April. Slightly reduced yields have resulted when planted in June after small grain. At higher elevations castors are planted in early May. Castor beans will grow well in cooler climates than cotton, and offer possibilities as a crop at high elevations where cotton cannot be raised.

#### Aid Tilth of Soil

Although castor beans do not produce their own nitrogen like leguminous crops, the following crop in the rotation is benefited by loosened soil condition. Therefore, castor beans are recommended in a good crop rotation. Castor beans should not follow castor beans, as many off-type plants result in the volunteers the second year and cannot be distinguished at thinning time. Little trouble with volunteers occurs where small grain follows castor beans.