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UNITED STATES DEPARTMENT OF AGRICULTURE.
" DEPARTMENT CIRCULAR 120.

Contribution from the Bureau of Plant Industry
(New and Rare Seed Distribution),
WM. A. TAYLOR, Chief.

SOY BEAN.

OBJECT OF THE DISTRIBUTION.—The distribution of new and rare seeds has for its object the dissemination of new and rare crops, improved strains of staple crops, and high-grade seed of crops new to sections where the data of the Department indicate such crops to be of considerable promise. Each package contains a sufficient quantity for a preliminary trial, and where it is at all practicable the recipient is urged to use the seed for the production of stocks for future plantings. It is believed that if this practice is followed consistently, it will result in a material improvement in the crops of the country. Please make a full report on the inclosed blank regarding the results you obtain with the seed.

DESCRIPTION.

The soy bean (*Soja max*), called also soja bean, Manchurian bean, and stock pea (eastern North Carolina), is an erect, rather hairy, leguminous plant, resembling somewhat in its early growth the ordinary field or navy bean. It is a native of southeastern Asia and is grown extensively in China and Japan, being used for human food, for forage, and as a green manure. The soy bean is a valuable crop in various ways and has many points of superiority over the cowpea. The high yield of seed, the nutritious forage, the ease of growing and harvesting, and the freedom from insect enemies and plant diseases should encourage the planting of this crop. One of its most common uses is for hay, which is comparable to alfalfa and red clover in feeding value. The yield of hay is about equal to that of the cowpea, or about 2 tons to the acre. As a pasture plant the soy bean may be utilized to advantage for all kinds of stock, but it is especially valuable for hogs, supplementing the corn ration. It is also valuable as a soiling crop, yielding from 5 to 10 tons of green forage to the acre. Good results have been obtained where soy beans and corn are mixed as ensilage. The soy bean can be used to advantage for green manure, greatly increasing the supply of humus and nitrogen of the soil. For a greater variety and larger yield of forage it may be satisfactorily grown in combination with other crops, such as cowpeas, sorghum, corn, and Sudan grass. The use of the seed or meal as a substitute for cottonseed or oil meal in the feeding ration has given excellent results. Thus far, soy beans have been a profitable crop to grow for seed. Under ordinary conditions the best varieties yield from 20 to 30 bushels to the acre. As a human food the soy bean may be used as a green vegetable (when the seed is about full grown), while the dried beans may be roasted

as a substitute for coffee, in soups, or baked, and as flour or meal, the same as corn meal. In addition to their forage and food value, soy beans contain a valuable vegetable oil utilized in many trades. The cake remaining after the oil is expressed is a valuable feed for all kinds of live stock.

ADAPTATION.

The soy bean has a wide adaptation as regards soil and climatic conditions. In general, the northern limit of its adaptation in the United States may be said to be that of corn, and the southern limit cotton. The soil requirements are quite similar to those of corn. Rabbits are exceedingly fond of the young plants and sometimes cause serious injury where the plot is small, especially in the semiarid regions.

INOCULATION.

Soy beans, like other legumes, when well inoculated add much nitrogen to the soil. Natural inoculation occurs quite generally throughout the South. In isolated localities where this crop has not been previously grown, some difficulty from lack of inoculation may be expected. Northward and westward greater difficulty in this regard is experienced. The inoculation of a new field may be secured by mixing 1 gallon of soil from an old soy-bean field with a bushel of seed, or with pure culture, which may be obtained from the United States Department of Agriculture free of charge.

CULTURE.

The land should be thoroughly prepared before seeding. If the soil is low in fertility, phosphoric acid and potash should be applied to obtain the best results. Soy beans may be sown at any time after danger of severe frosts is over, ranging from early spring until mid-summer. The general practice for seed production is planting in rows, 30 to 48 inches apart. For hay, soiling, or green manure, a drilled or broadcasted crop furnishes a finer quality of forage. In rows, from 20 to 30 pounds of seed to the acre are found satisfactory, and if broadcast or drilled, 60 to 90 pounds. The ordinary grain drill may be used in planting by covering the feed cups not in use, thus spacing the rows as desired. The cotton planter or corn planter may also be used. For small areas the ordinary garden drill does well. The planting should be shallow, not exceeding 2 inches in depth. As soon as the seedling plants appear above the ground cultivation should begin. Soy beans should receive at least three cultivations.

HARVESTING.

The time of harvesting depends on the use to be made of the crop. Soy beans are best fitted for hay when the pods are well formed. When grown for grain alone, the cutting may be delayed in the case of most varieties until all of the leaves have fallen. The early varieties can best be harvested with a mowing machine or bean harvester.

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The later and taller growing varieties can be harvested satisfactorily with a self-rake reaper, a mowing machine, or a self-binder, the last being the best for rather tall varieties. Special machines are now on the market for harvesting the seed from the standing vines.

THRASHING.

Soy beans may be thrashed with an ordinary grain separator if run at moderate speed and by removing some of the concaves. Special bean and pea separators are now on the market and do very satisfactory work. With small areas, soy beans may be cut or pulled, tied in bundles, and flailed out when thoroughly dry.

STORING.

After thrashing, the beans should be spread out and not massed in quantities. Soy beans will heat easily if not thoroughly dry, and their ability to germinate will be ruined.

VARIETIES.

At the present time about 15 varieties of soy beans are handled commercially by seedsmen. More than 500 distinct varieties are known and have been grown by the Department of Agriculture on its testing grounds. Several of these have proved very promising in different sections of the country and are now on the market. Varieties are largely distinguished by the color and size of seed, though they differ in maturity, habit of growth, etc. Following are notes on the more important varieties.

Mammoth (seeds straw yellow).—This is the standard commercial late variety, more extensively grown at the present time than any other. The Mammoth yields well and is satisfactory for both grain and forage. It can not be expected to mature north of Tennessee and Virginia.

Haberlandt (seeds straw yellow).—This variety matures in about 120 days. The Haberlandt is most satisfactory for grain production, but it is not especially desirable for hay. It is strongly recommended where an earlier variety than the Mammoth is desired.

Manchu (seeds straw yellow).—This variety was obtained from northern Manchuria and matures in about 110 days. The Manchu makes an excellent production of both forage and seed, excelling any of the early varieties now on the market. It is especially adapted to the Northern States.

Tokio (seeds olive yellow).—This variety is about a week earlier than the Mammoth. The Tokio gives rather too stocky a growth for desirable forage, but is most satisfactory for grain production. Most excellent yields of grain have been obtained under ordinary conditions in North Carolina and Tennessee.

Virginia (seeds brown).—A tall, slender variety, vining at the terminal, and maturing in about 125 days. The Virginia on account of its abundant growth and heavy yield of seed makes a most excellent forage variety. It is also recommended for hay and silage mixtures.

Biloxi (seeds brown).—A very late, coarse, bushy variety, growing from 4 to 6 feet high. It makes a very abundant growth and gives a fair yield of seed. As the Biloxi requires a very long season for maturity, it is only adapted to the southern part of the Gulf States for seed. It is valuable for the rice lands as a green manure and is also suitable for hay and silage.

Barchet (seeds brown).—This variety requires a rather long season, maturing about 10 days later than the Mammoth. The Barchet makes an excellent growth and is to be recommended for hay and green manure in the Gulf States.

Wilson (seeds black).—An erect, slender variety, maturing in about 120 days. The Wilson is considered one of the best hay varieties, making an excellent production of both forage and seed.

Peking (seeds black).—This variety has small flat seeds and matures about the same as Haberlandt. The Peking not only gives a good yield of grain, but is one of the most desirable for forage.

Black Eyebrow (seeds black and yellow).—This variety was obtained from northern Manchuria and matures about the same as Manchu. The Black Eyebrow is very satisfactory for both hay and seed production. It is to be recommended as a grain variety for the Northern States.

Hahto (seeds olive yellow).—A large, erect, bushy variety, producing a large amount of seed and forage. The seed, when three-fourths to full grown, makes an excellent green vegetable, similar to the Lima bean.

Easy Cook (seeds straw yellow).—This variety is a strong, vigorous, bushy sort, maturing in about 130 days. It is very prolific, producing also an abundance of forage. The mature beans are of excellent quality, have a good flavor, and are easily cooked soft. The beans can be used as a green vegetable, but their use is recommended as a dried bean on account of the ease of cooking.

Laredo (seeds black).—A variety maturing about the same time as the Mammoth Yellow. It makes an abundance of fine forage and is a good yielder of seed. The Laredo is highly resistant to wilt and nematodes and is especially adapted to lands where these troubles are prevalent.

Mandarin (seeds straw yellow).—An early-maturing variety obtained from Manchuria and found especially valuable as a grain producer for northern conditions. It will mature farther north than any variety now on the market.

PUBLICATIONS.

Farmers' Bulletins 973 ("The Soy Bean: Its Culture and Uses") and 886 ("Harvesting Soy-Bean Seed"), giving more complete information concerning this crop, are available for free distribution on application to the Secretary of Agriculture, Washington, D. C.

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