

New Crops for Kansas.

Nature works in a mysterious way her wonders to perform. Often some valuable tree or cereal will be found in one country or locality only, while it may be adapted to many parts of the globe because of some particular character. Sometimes certain plants do even better in a new country than in the old country, for instance, the European larch tree does better in Europe than here for there it escapes the insects which so hinder its best development here.

In the last half century the work of transplanting and testing the tree

"NEW CROPS FOR KANSAS"

in other localities of countries has been carried on to a great extent. In

by

many instances this work has been performed by single individuals. For instance, people coming to the

RAY FELTON.

with them their favorite apple, cherry or pear. But in the United States by far the greater amount of this work has been carried on by the department of agriculture with the co-operation of the experiment stations of the different states. The worth of this work cannot well be overestimated. It has transformed the bare burned and dirt swept plains of the central west, into comfortable home surrounded by growing crops. It has brought Kansas the soy bean, ruffy corn, sorghum, wheat and alfalfa.

The method of procedure is quite interesting and yet very simple and common sense. If it is desired to obtain a wheat for western Kansas, which is very drought resistant, the department of agriculture would send a man to the dry regions of Europe to study varieties. He would try to find a region with weather conditions as similar to Kansas conditions as possible and then take down a

New Crops for Kansas.

Nature works in a misterious way her wonders to perform. Often some valuable tree or cereal will be found in one country or locality only, while it may be adapted to many parts of the globe because of some particular character. Sometimes certain plants do even better in a new country than in the old country, for instance, the American locust tree does better in Europe than here for there it escapes the bores which so hinders its best developement here.

In the last half century the work of transplanting and testing the trees, cereals and grasses of one locality or country in other localities or countries has been carried on to a great extent. In many instances this work has been performed by single individuals. For instance, people coming to this country to settle, often bring with them their favorite apple, cherry or pear. But in the United States by far the greater amount of this work, has been carried on by the department of agriculture with the co-operation of the experiment stations of the different states. The worth of this work cannot well be overestimated. It has transformed the sun burned and dust swept plains of the central west, into comfortable homes surrounded by growing crops. It has brought Kansas the soy bean, kaffir corn, sorghum, wheat and alfalfa.

The method of proceeedure is quite interesting and yet very simple and common sense. If it is desired to obtain a wheat for western Kansas, which is very drouth resistant, the department of agriculture would send a man to the dry regions of Russia to study varieties. He would try to find a region with weather conditions as similar to Kansas conditions as possible and from this place a

number of the best varieties would be selected and sent to Kansas to be tested at the experiment station at Manhattan, and the branch station at Ft. Hays. If any of the varieties proved to be superior to varieties already grown here, they would be recommended to the farmers and distributed to them as far as possible. These government officials also keep their eyes open for new crops. If in the countries explored there are found growing any new crops which are considered valuable, and which it is deemed might find or fill a place in American agriculture, they are also introduced and experimented with. Of course it stands to reason that not near all of these trials are successful and hundreds of varieties of trees, fruits and cereals have been introduced which have proven total failures, not being adapted to one climate, or meeting here some enemy not encountered in their native habitat. Great care is used to prevent the introduction of disease although it once in a while occurs causing considerable loss, but on the whole the work has been very beneficial many times exceeding the expense to which the government has been put.

The crops which are discussed on the following pages are comparatively new to Kansas. Some of them have been tested for a number of years at the experiment station, but very few of the farmers of the state are familiar with them. Practically every cultivated crop grown in this state has been introduced from some other state or nation. Is it probable that we now have in our list of crops all the good ones, or that there are not other varieties of the same crops which are better producers than those now grown? I think not.

One problem which is encountered in the introduction of new species of plants is, that often a new industry has to be started

to utilize the products furnished by this new crop, and also that the people have to be taught to use the new products. The former is today with our immense amount of capital no great difficulty, and the latter is quite easily overcome because of the fondness of the American people for a diversified diet.

Macaroni Wheat.

Macaroni wheat is so called because the product known as macaroni is made from the semolina (flour) of this wheat. The macaroni wheat plant grows quite tall with a broad smooth leaf, and a heavy bearded head, very much resembling the head of barley. It has a splendid development root system which goes deep into the ground, well adapting it to the securing of moistures, but it does not stool as much as common wheat. This wheat is found in very dry regions of Russia and for its drouth resisting qualities was introduced into this country to be grown in the dry regions of the great plains. It is preeminently adapted to the western part of our own state.

Very little of the macaroni used in the United States is manufactured here and the home made product is inferior in quality because it is made from large manufacturers of this product. Macaroni, like bread and crackers made from common wheat, is best when fresh, so the American people know very little about what good macaroni is like. When they once get a taste of it fresh there will be an increased demand for it. Very good bread can also be made from the semolina of this wheat and it is more nutritious than common wheat bread, although being quite dark it does not look so nice.

Quite a number of conditions and unfortunate circumstances have entered in and to a great extent hindered the growth of the macaroni industry in this country. Some varieties of the wheat introduced into localities where they were not adapted and of course

gave only disappointment. Then as this wheat when mixed with common wheat impaired the quality of flour, the elevators refused to buy it. The people stimulated by its increased yield sowed large acres which so scared the millers that they paid twenty cents less for a bushel than for other wheat. The wheat is so hard that special machinery is required to grind it. The common mills cannot handle it without putting in new machinery, which the millers are not likely to do until they are insured enough to grind, to keep their mills busy. There are several macaroni factories in the United States but they do not grind their own wheat and thus far have used the common wheat flour principally from the Kansas and Minnesota mills. But present prospects are most encouraging. European manufacturers are willing to contract for our wheat, as samples sent from this country have shown it to be of superior quality. A number of American factories are showing a disposition to use semolina, and several American mills are now grinding macaroni wheat.

The reason that macaroni wheat is superior to common wheat is because of its large protein content. It contains from 13 to 19 percent, compared with 10 to 12 percent in common wheat. An interesting and very important question to be determined was whether or not, the change of environment from Russia to this country would lower the protein content, and thus reduce its value. The South Dakota experiment station took up this question in a series of experiments extending over several years. It was found that the protein was not reduced in the least, but on the contrary seemed to increase slightly presumably because of the better soil.

In Kansas macaroni wheat will have to be grown as a spring wheat, for although it thrives under quite adverse circumstances, as regards alkali soil and lack of moisture, it is quite susceptible

to cold, being liable to winter kill any where north of the 35 th parallel. It needs for its best developements a good ~~state~~ rich soil such as we have in this state. Sow the wheat in a well prepared moist seed bed in May putting in about one and one-half bushels per acre, this amount being necessary because it does not stool a great extent. As to just what varities are best adapted to our conditions we cannot say at present. At the branch station at Ft. Hays, a number of varities have been grown for a single season. Those producing best were Kubanka, Aronantka and Velvet Don. In South Dakota, amantha and ghaanooka were reported as heavy yielders while velvet don was recommended for its excellent drouth resisting qualities.

I believe it would pay every Kansas farmer expecially in the western half of the state, to give this grain a trial of several years. I would not advise a large acreage until it has been given a trial but a few acres may be sown at little cost. It will produce from one third to one half more than ordinary wheat in dry seasons and there is little doubt that we will soon have a market for it as we use a large amount of the products in this country. And should the grower fail to find a market for it, it can be utilized to good advantage as stock feed.

Bronus Inermis.

Bromus inermis is also known as Hungarian brome grass, Austrian brome grass, aunless brome grass and as brome grass. It is a perennial somewhat similar to English blue grass in appearance, growing from two to four feet high and quite leafy. It spreads by means of underground stems and these stems send up new plants so rapidly, which in turn require more roots, that in a few years the roots become so thick and matted as to interfere greatly with

the growth of the grass. For this reason it cannot be used as a hay crop for more than three years, and in double that many years its pasture value is lessened. Experiments for relieving the roots by disking are being carried on at this station, but it is too early to tell the results.

Bromus inermis like macaroni wheat was introduced into this country because of its drouth resisting qualities. In Hungary where it has been grown for thirty years, it has withstood drouth so severe that all other fodder plants were destroyed. In the United States it has been grown successfully in Idaho, California, Colorado, North Dakota, Ohio, Mississippi, this state and others and in all places its ability to resist drouth has been noted. *Bromus inermis* is better adapted to use as a pasture grass than for hay and that is the principle use to which it will, I think be put in this state although it produces excellent hay the first few years after seeding.

Cattle are especially fond of it and will leave native grasses to eat it. This was shown on a farm in North Dakota where the grass was accidentally scattered in the corner of a native grass pasture. The cattle kept it eaten off very close staying on it as long as they could get a mouthful. It can be pastured very heavily for as it is so easy to get a stand it is best to plough it up occasionally and resow and if the grass is over pastured, little harm is done. The beauty of this grass for pasture is that it starts very early in the spring and lasts until the first snow in the Fall. During extreme drouth in the summer it will dry up and appear quite dead, but it greens up and starts a new growth very soon after a rain.

The seed of this grass is quite small necessitating a very fine seed bed similar to the bed prepared for alfalfa and about fifteen pounds should be sown to the acre, which is a little over a bushel,

the weight of a bushel of seed being fourteen pounds. If the grass is to be used for immediate pasture it would probably be a good plan to sow a little heavier. The sowing has to be done broadcast either by hand or with a broadcast seeder for as the seed is so light and chaffy it will not satisfactorily feed from a common drill. It can be sown quite early, the middle of April being about the right time, other conditions being favorable. If the grass is a little thin the first year, don't destroy it for it will soon thicken up. It is best not to pasture the first year but ~~to~~ mow a couple of times to prevent the weeds from going to seed, and leave the mowings on the ground for a mulch. Do not mow too close but set the sickle far four or five inches high. A nice way to handle the second year is to cut the first crop for hay and then let the aftermath grow which produces excellent Fall grass. If a seed crop is desired let the grass get quite ripe and then bind with a wheat binder. In threshing nearly all of the wind must be shut off or the seed will be blown over.

Very little work has been done with *Bromus inermis* to determine its value as a rotation crop most experiments pointing toward its feeding value and hardiness. Prof. A. M. Ten Eyck of the Kansas Station, formerly of North Dakota Station, made a single trial at the North Dakota station and raised good crops of wheat and flax after *Bromus*. The principle objection to the grass in this role is the difficulty of destroying it, but if it is turned over as soon as the hay is removed and then back set in September this trouble is overcome.

Central and western Kansas has long needed a pasture grass. No very satisfactory method of crop rotation can be followed without including pasture in it, and then in many cases the farmers have

rashly broken up most of their prairies to sow to wheat, and have later rued it. Having no grass suited to their conditions they have been compelled to do without permanent pasture. I believe that *Bromus inermis* is to solve this problem for them, and if so, it will be a blessing to many a hard working horse as well as its master.

Western Rye Grass

sometimes called slender wheat grass. It is of the same family as quack grass but unlike it does not send out underground stems so need not be feared. Western rye grass is properly speaking, a perennial bunch grass, which under range conditions, grows twelve to eighteen inches high and under cultivation may reach the height of three feet. The roots are deep feeders, this well developed root system enabling it to withstand a remarkable amount of drouth.

Western rye grass in the west and north-west is the great rival of *Bromus inermis*. Comparing the two: *Bromus inermis* is more of a pasture grass while the rye grass is better for hays. The *Bromus* starts earlier in the spring, grows later in the Fall and the hay is better relished by stock but the rye grass produces a heavier yield which is more nutritious and also withstands better an alkali soil. Both are drouth resisters, the rye grass excelling; both are moisture endurers, the brome grass excelling; both are soil binders, the brome grass excelling in this also.

Western rye grass is able to stand exceeding low temperature without injury. There are few grasses that will adapt themselves to a greater diversity of soils and climatic conditions than this grass, but of course the more favorable the conditions the better the crop. The ground should be in good condition when this grass is sown. A good method is to plough the ground in the Fall and then in the spring give frequent surface tillage to conserve the moisture

and keep down weeds until time of sowing, which is about the last of April or even earlier in the South part of the state. The seed may be sown broadcast or with a drill, which has a vertical feed. About fifteen pounds per acre gives good results. For hay sometimes *bromus inermis* and rye grass are mixed half with splendid results. Mow as often the first season as necessary to keep the weeds down. After three or four years the grass does not do so well and should be ploughed up and resown or better still sown in a new field sowing the old field to grain, it thus working nicely as a rotation crop. However if it is hard to get a stand it would be best to let the grass stand as long as it will produce paying crops. This grass is not hard to get rid of like *Bromus inermis*.

Western rye grass matures rather late and produces from two hundred to four hundred pounds of seed per acre. The seed weighs about twenty pounds per bushel. As soon as the seed has ripened it should be harvested or there will be loss from shattering. The head changes color when ripe and is easily recognized. The best way to handle the seed on a large scale is to harvest with a self-binder and thrash with a common grain thresher. The seed will probably have to be run through a fanning mill before being fit to sow.

Western rye grass has been grown to a very limited extent in this state, but it has been grown from California and New Mexico to British Columbia and from Nebraska north, and has shown a remarkable ability to adapt itself to numerous conditions, so I think there is little doubt about its doing well in Kansas, and if it succeeds it will be of great value to the stockmen who have been unable to produce their own hay. Give it along with *Bromus inermis* a fair trial and it will do the rest.

The Cow Pea.

The cow pea can I think properly be considered a new crop for Kansas, although it has been grown in the southern states for years and in our own state to a limited extent. The crop is best adapted to the southern part of the state although certain early varieties grow well in northern Kansas.

The cow pea is an annual from southern Asia. The different varieties show a marked difference in their habit of growth, some varieties having a long trailing vine, others growing quite up right with many degrees of variation between. In selection of seed this difference in habit should be taken into consideration. If the crop is to be utilized as hay, select such varieties as whippoorwill, wonder, or New era which grow upright and can be mowed with a mowing machine. It is very difficult to harvest the trailing varieties. Cow peas may be sown quite thickly and pastured to good advantage. Cattle relish and do well on them and the expense of cutting and stacking is saved. Of trailing varieties may be cut by means of the soy bean cutter or any implement with a knife cutting just beneath the surface. The yield of fodder may range from one to four tons per acre. The only satisfactory method of harvesting the seed is by hand. Of the vines are harvested and run through a thresher, a large percent are cracked so that they will not germinate.

A number of different plans of sowing cow peas are practiced. They are sometimes sowed ~~sa~~ between the rows of corn, or used as a catch crop after wheat is removed. In Kansas they may be sown any time from the middle of May until August. Broadcast sowing is wasteful and unsatisfactory. A good way is to sow with a wheat drill, stopping every second or third hole.

Cow peas vines make excellent hay. In fact it is superior to timothy and other hays from natural timothy grasses, for all hay

eating animals. It is superior to alfalfa and red clover hay in composition, and equal in digestibility. A ton of cow pea hay is equal in feeding value to a ton of bran. As it has so high a protein composition it should be fed with other coarse feed, such as millett corn, sorghum and kaffir corn. In cutting for hay let the vines get quite mature as they are difficult to cure. As soon as the first leaves dry rake into windrows and as soon as dry put into cocks. A good way is to stack around poles seven to ten feet high, which insures free circulation of the air through the vines, drying them out and preventing molding. Or where it is unlikely that there will be enough sunshine to cure the vines without spoiling, they are sometimes made into a hollow stack by nailing three ten or twelve foot poles together at the top, and letting the bottoms stand four or five feet apart, and stacking over these the wilted vines, making a stack seven or eight feet in diameter. Thus they will cure very nicely.

Cow peas are very beneficial to the soil. By means of the bacteria which grow on the roots of the plants the crop is enabled to extract free nitrogen from the air of the soil. Thus the crop does not exhaust the nitrogen of the soil but really increases the supply, and tends to build up the soil fertility. Although cow peas produce excellent hay, because of the difficulty of harvesting this hay their chief use will be for soiling and pasturing purposes, also as a rotation and a green manure crop in which field they merit the attention of every farmer who cares to keep up the fertility of his soil.