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**PREPARATION OF NEW  
LAND FOR CROPS**

By ALVIN KEYSER

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There are large numbers of new settlers coming into Colorado. Many of these come from regions where the conditions are quite unlike our own. The lands are different, the vegetation is different, the climate is different. A new and special agriculture must be learned. Many of these settlers do not have sufficient capital to properly develop the land, to say nothing about the loss of capital due to insufficient experience under the new conditions. It is hoped that this brief advance bulletin will assist these persons in meeting some of these new problems.



## Kinds of Land.

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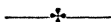
For convenience of treatment the different kinds of land discussed will be referred to as Sod land, Buffalo Sod land, Sage Brush land, etc., according to the prevailing type of vegetation growing upon the land.

Probably the largest areas of new land still to be brought under cultivation are to be found in the plains region lying east of the Rocky Mountains. The major portion of these reg-

ions is Sod land and Buffalo Sod land. On the Buffalo Sod land, Buffalo grass and Grama grass constitute the greater portion of the vegetation. On the Sod land, the vegetation may be any one of several different prairie grasses or a mixture of several of them. Where there is a sod due to any of these grasses the treatment is much the same. The sod is first broken to a depth of three or four inches using a breaking plow. Such a plow is equipped with a very long slope mold-board which turns the furrow slice upside down with very little pulverizing effect. To leave the soil in the best condition, the breaking is done when the soil is moist. Since the sod is more often moist in the spring, spring is usually the best time to do breaking. If crops are to be grown on the breaking (so-called sod crops), best results are obtained by rolling the sod down flat. This must be so thoroly done that the sod has perfect contact with the subsoil beneath. The rolling may be accomplished by using any of the common solid or corrugated rollers. It may be successfully done by using a disk harrow set straight and weighted. After rolling, a mulch may be produced at the surface by harrowing once

or twice with a heavy spike tooth harrow.

The soil is now ready for planting any desired sod crop. If the preparation was done when the soil was moist, or if later rains wet the soil, fairly good yields may be expected.



## Sod Crops.

Not all crops do well upon such a seed bed. Corn, if a variety adapted to the locality, will make fair yields in ordinary seasons. The disk planter is better than the shoe planter, as it easily penetrates the soil. Thus it plants the seed in moist soil at a uniform depth. The corn is best planted in drills 18 to 22 inches apart in the row and 3½ feet between rows. Sod corn needs little further cultivation. It may be harrowed at first.

In normal seasons, flax is one of the best first crops for the sod land. The sod is prepared the same as for corn. The flax may then be drilled in with a press, single disk drill using from 25 to 35 pounds of seed according to quality. Usually flax should be planted about the middle of May.

Milo is a good feed crop for sod land at altitudes below 5500 feet. It is planted in drills 6 to 8 inches apart in the row. The corn planter with milo plates is used. If the corn planter is not provided with proper plates, blank plates furnished with the planter may be used by drilling holes properly sized and spaced.

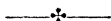
For fodder, cane and Kafir do well. They are planted with the grain drill. The holes not wanted must be covered or stopped.

Stock melons and other melons grow well as sod crops. When properly handled, potatoes will do something. Where milo does well broom corn will grow and is a good sod crop for those understanding its management and culture.

If the sod has been prepared as for corn and properly handled later by giving a light disking and harrowing, winter wheat may be seeded with fair prospects for fair returns.

After the sod crop the sod is back-set. On the "hard" lands this should be done deeply, 8 to 10 inches or more for best results. The plow is then followed the same half day with the disk and harrow. The disk should be used vigorously enough to compact the soil,

destroy all large open spaces and reduce any lumps or sod chunks. The harrow will pulverize the surface. After this treatment the soil is ready (if sufficiently moist), for adapted crops. One of the largest items of success lies in keeping the soil moist.



## Handling Sage Brush Lands.



Sage Brush lands are more liable to be encountered in irrigable regions, valleys, mountain valleys, mountain parks, mesas and table lands. The sage brush may be small and thin on the ground, indicating dry conditions or poor soil. It may be large, **rank** and abundant. In the first instance, it may be largely disregarded as it will offer little difficulty to plowing. In the second instance, it must be removed from the land before plowing can be done or crops planted. There are plows, known as Jumbo plows, which will handle sage brush, but they **can** only be well handled by steam or gasoline tractors.

## Clearing Sage Brush.

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Clearing Sage Brush from the land may be managed in several ways. Only a few of the most promising and successful methods will be given. The brush may be grubbed off by hand. While successful in getting rid of the brush the method is slow. It is adapted to two sets of conditions: 1st, where labor is cheap; 2nd, where the area to be cleared is small or where the large brush is scattering.

A method which has been practiced in those localities where snow is not abundant in the cold season, is to draw a heavy railroad rail over the brush when the land is frozen hard. Four to eight horses are required according to the size of the rail and brush. With the land in this condition the brush breaks off at or below the surface and can be raked and burned.

The brush may be burned off while standing when the conditions are just right. These are adequate fire protection so as not to endanger the surrounding property and very dry brush. It is only in an occasional season that the brush becomes dry enough for successful burning, but when the condi-

tions are right there is no way of as quickly getting rid of sage brush.

One of the most practical ways of removing the brush is accomplished by heavy disk plows. The plows are set to cut about two or three inches beneath the surface. Thus the brush is cut off. It may then be raked and burned. Owing to the fact that this method takes considerable power and that sage brush is rather severe on horses' legs, some sort of a power tractor is advisable wherever feasible. Under most conditions of work this method will be found cheap and effective.

A home made grubber has been used to some extent which has proved successful where sufficient power was available. Such a grubber is made out of heavy planks, timbers or logs. One side is made straight and the other set at an angle. The front of the angle edge is shod with a heavy sheet steel lay or blade. This blade is kept sharp so that it will cut the sage brush with a slanting cut, from two to three inches below the surface of the ground. The rear corner of the machine is provided with a blade cutter which penetrates the soil 8 to 10 inches and prevents the machine from sluing side-



wise. Weight is essential in this machine. If it is not heavy enough the desired weight may be obtained by weighting with sacks of earth or with stones. This machine when properly made and handled is very effective.

There is a machine now on the market which resembles a blade road grader. With plenty of power it works well.

A machine much used is made to work similar to the old fashioned revolving rake. This machine is provided with an opposite or double-ended set of tool steel teeth of about  $1\frac{1}{4}$  to  $1\frac{1}{2}$  inch stock. The outer ends of the teeth are forged so that they bend forward at or nearly at right angles, forming hooks. These catch and pull out the brush or are, at least, supposed to. When the machine fills with brush it is released and revolves the other set of teeth into action. There are a good many of these machines used. On light brush they work quite well in the hands of careful men. On rank, heavy brush they are not very satisfactory.

After the successful removal of the sage brush the land is leveled and plowed. Slight inequalities may be removed by dragging with a heavy tim-

ber drag, the front edge of which is steel shod. Considerable inequalities may be best reduced by the fresno, a kind of broad scraper adapted for moving quickly, large amounts of earth for short distances. Frequently no preliminary leveling is necessary.

Sage brush lands should be plowed deeply. If the land can be turned 8 or 10 inches deep or even deeper better results will obtain than from shallower plowing. For the most part sage brush lands are compacted. They support very little vegetation other than sage brush. Consequently they respond well to a first deep plowing.

Where deep plowing is thoroly done plow, better crops are often obtained and the land is well worked after the the first season than after three years of shallow plowing. It is often said that three years are necessary to subdue the land. If shallow plowing is done, it may take that long, but with deep plowing good crops should be grown at once if sufficient water is applied.

## Crops for New Sage Brush Land.

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The choice of crops for sage brush land will depend on soil, location and altitude. The grains almost always do well. On the proper soils and in adapted locations, potatoes thrive. Garden stuff nearly always does well. For the most part sage brush lands are deficient in organic matter and will not reach their best production until after they have been in alfalfa or other legumes. In the higher altitudes, field peas and alsike clover will often be used as the rotation crop to increase the productive capacity of the lands. Thus land which has been in peas, clover or alfalfa will produce larger crops than virgin soil.



## Brush Lands and Small Timber Lands.

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Brush lands and small timber lands occur locally in many portions of the state. They are most abundant about the edges of upper valleys, mesas and

mountain parks. The brush and small timber may be willow, scrub cedar, quaking aspen, dwarf pine or other varieties of timber or shrubs.

There are plows called Jumbo plows which are designed to clear such land when the brush and shrubbery does not attain a diameter greater than three or four inches. These Jumbo plows will even turn out small trees if there is enough power attached to them. On land where they can be used, they are by far the cheapest clearing agent. They can be used on almost any land where a heavy traction engine can travel, if the small trees are not larger than four inches in diameter. The chief objection to such an outfit is its first cost. If, however, there is any considerable acreage to be cleared, an outfit consists of Jumbo plow and a traction engine (either steam or gasoline) will clear the land at a lower acre cost than any other method.

Sometimes the land is too rough or the timber too large or the acreage too small for Jumbo plows. In that case the land is cleared by grubbing. Grubbing may be done by men with axes and grub hoes assisted by a team or teams with block and tackle. By attaching the tackle high up on the small

trees, the horses will do most of the work of removing the tree. Only a few blows will be necessary to get the tree out of the ground.

A quicker, easier and just as cheap a way to get the larger stuff out of the ground, is to use dynamite. Holes are bored slantwise under the trunks and the proper amount of dynamite inserted, connected with fuse, tamped and detonated. A little experience will tell just the proper amount to use. Powder manufacturers furnish very complete directions for using dynamite for such purposes, giving amounts to use, manner of using and precautions for safety. Dynamite lifts the trees out very effectively so that they may be gathered with the least possible amount of work.

After the brush and trees have been cut, grubbed, pulled or blown out, it is necessary to gather all this stuff up for wood or poles or for burning upon the land, in order to get rid of it. The land may then be leveled to fairly uniform grades and plowed deeply. Such lands may be adapted for fruit, for grain or other crops, depending on location. Such lands in Grand, Routt and Rio Blanco counties are adapted to grains, such as early barleys, oats

and winter wheat, potatoes, stock roots, timothy and alsike clover and field peas. In the southern part of the state, similar lands are often good fruit lands.