

**Retaining Soil Moisture.**

All the plants get their food through the moisture in the soil. As evidence of this, even a poor farm will give a fair crop in a favorable season. Every ton of dry matter in a crop of flint corn represents an absorption of 325 tons of water from the soil. Even the mineral matter of the soil is taken up by plants through the medium of the water in the soil. This is accomplished through the action of the acid in the roots, the acid breaking up the mineral substances and bringing them into solution. This may be clearly seen by taking two pieces of marble hollowed out to hold water. In one put water only; in the other a few grains in the water. After these grains have sprouted and grown, clean off both pieces. The former will be found perfectly smooth; the latter will be roughened, as a result of the action of the acid on the marble.

**Effects of Capillary Attraction.**—Sandy soils are frequently too loose to act with power in this respect. On the contrary, clay soils are frequently too compact. In consequence, these soils require special treatment. The lamp-wick well represents this. It is possible to have a lamp-wick woven so closely that the oil will not rise (clay), and it may be woven so loosely that the oil rises very slowly (sand). All cultivation should be done with this principle ever in mind. Soil preparation should do two things: First, preserve a very fine tilth of surface soil to prevent undue evaporation of moisture; and, secondly, to keep the lower soil and the subsoil in such friable but compact condition that the raising of the moisture from the lower layers will be facilitated. Tile draining assists this action by drawing off surplus free water, and thus allowing of access of air to soil and subsoil—a necessary provision. Baking of surface soil should always be prevented if possible, because such condition favors rapid evaporation. Soils should not lie in spring until the surface bakes, for above reason. If not ready to put crop in, at least run the harrow over the surface to help retain moisture. Constant and proper cultivation of surface soil acts as a soil mulch. The Ontario Agricultural and Experimental Union experiments show the effects of ridging or firming the surface of soils. Drilling and then rolling resulted in a rapid evaporation of soil moisture, but drilling, rolling and then harrowing gave good results, showing the necessity of leaving the surface soil loose to prevent evaporation. The amount of humus or vegetable matter in soils is an important factor in controlling moisture, and in the present depleted condition of many soils, every effort should be made to secure the presence of large amounts of humus. Fall cover crops do a great deal towards preservation of moisture by adding to the total humus content. They also prevent leaching in light soils, and should be much more generally used.

**Manure: Barnyard and Green.**—Plant-food in the soil is often in an unavailable form. The addition of green manure assists materially in liberating this fertility. Many hundreds of acres of worn-out soil in New England States are being reclaimed almost solely by use of green crops as manures. Whether these crops shall be fed off on the land or turned under direct is a matter for settlement at the hands of the individual. The kind and age of the stock we feed will materially affect the results as far as the land is concerned. Manure resulting from the feeding of young and growing stock will contain about 65 per cent. of the original content of the food in manurial values to be returned to the soil, while that from fully matured animals will contain about 90 per cent. The manurial value of food is a question that merits more careful study than it usually receives. Clover hay stands twice as high as timothy in this respect. Buckwheat middlings stand high, and we also notice that they are a very excellent foodstuff for milk or pork production. The Soy bean is likely to be much more generally used as food as it becomes known, and the resulting manurial value is great; its manurial value per ton being about \$16. The cow pea (not a pea, but a bean) is another food that stands high in both these things. The hay from both these crops is also high in food and manurial value, the latter having a nutritive ratio of 1:3.8. They have a manurial value more than twice that of oats, and can be bought for much less money per ton. The leguminous crops give more favorable results in manurial value than the cereals, due to their power to abstract the nitrogen from the atmosphere and their richness in this most valuable fertilizing material. It is well for us to remember that those grains and coarse fodders that are most valuable as foods are also most valuable from a fertilizing standpoint. Our soils are very commonly deficient in humus, and the use of green crops as manures is one of the cheapest methods of supplying the deficiency. Humus is not only a plant-food in itself, but its presence in the soil materially helps to liberate the dormant plant-food already in the soil.

**Green Clover.**—Re the plowing under of green

clover, it is well to study the following results of experimental work along this line:

Period of growth.	Resulting manurial value.
5-7 in. high.....	\$21.94
12-14 in. high.....	34.64
Blooming stage.....	37.00
Fully matured.....	44.00

The very great difference in the value between the blooming stage and the fully-matured plants would seem to be due largely to the fact that the plant, as it approaches maturity, seems to spend all its energy in an attempt to mature its seed, and in doing so makes great root development, and the clover roots are rich in plant-food constituents of the most valuable kind.

Middlesex Co., Ont. F. J. SLEIGHTHOLM.

**Running Saw with Windmill.**

I see in your March 1st paper an enquiry re running a saw with a windmill. I have no difficulty in running a saw 24 inches in diameter with a 14-ft. Brantford mill, at a distance of 50 ft. from the shaft, with a 4-inch rubber belt. To hold up the loose side of the belt, put a loose pulley on a short shaft about midway of the belt. We have threshed peas by connecting-rods at a distance of 60 feet from the foot-gear of the mill. I see no difficulty in Mr. Lapp running his saw 100 feet from the mill with a belt, if he arranges to carry up the slack side of the belt. I do not like a rope, as it gives so much trouble stretching when dry and contracting when damp. With a good wind we can saw cordwood as fast as three men can hand it on. If the slack side of the belt is not carried up it flops down and knocks off the belt.

WM. H. BEBEE.

Wright Co., Quebec.

**Clover Growing in Lambton.**

We have always been very successful in securing good catches of clover, whether sown with spring crops or winter wheat; therefore, in response to the invitation in the March 1st issue of "Advocate," I will give the method we pursue.

We have adopted a three-year rotation, which we find best meets our requirements, and we think it most beneficial to the land. Our rotation is: 1st year, clover; 2nd year, part to corn and remainder to beans; 3rd year, bean land to winter wheat and corn land to oats or barley, and all seeded to clover again.

With this rotation, if through any cause we fail in getting a clover catch during any season, it does not break up our regular rotation, as we can take a second crop of hay from field No. 1, plant beans after corn and corn after beans in field No. 2, and substitute oats for barley or barley for oats in field No. 3, which, after a good top-dressing of manure, is hardly likely to again fail in getting a good stand of clover.

Other advantages gained by taking but one crop of hay are: that a tough sod is never formed, thus avoiding that great enemy to grain crops—the wireworm; and in a favorite season for clover seed, the hay may be cut early and a crop of seed taken; or, after the hay is harvested, the field may be turned to pasture, practices which would be very detrimental if a second season's hay crop were desired.

Now, as to our method of clover seeding. On the land under wheat we sow the grass seed some still morning when the soil is open by alternate freezing and thawing during the latter part of March. Then, when the April showers come, the seed is all nicely covered. If sowing is delayed until after the soil becomes compacted by early



GENERAL ROUND-UP AT THE BIG BOW RIVER, SOUTHERN ALBERTA, JUNE 6th, 1901.

**Utilize the By-products.**

One of the reasons advanced by Canadian packers for the advantage the American packer has over them in being able to pay, on the whole, better prices for live stock, is the fact that the American utilizes the by-products. From the blood is got albumen, used in the arts and in medicine; horns and hoofs used for gelatine, and handles for brushes, for buttons, etc.; bristles for brushes; tankage for artificial manure, and so on; so that, as it is aptly put, "nothing is lost in the pig but the squeal." With all the above, the packer has been looking for further profits, according to the National Provisioner, who states as follows:

"The oily, greasy, thick pig skin is arousing new interest. Heretofore, the slaughter house has not seriously bothered itself about skinning the hog while his green hide left on the carcass and unencumbered with expense brought 8 cents per pound and more as pork, or 12 cents per pound when weighed in as cured ham or smoked bacon. The scientist will not let things alone, however, and it may yet pay to strip the hide from the hog for commercial purposes. The leather splitter has demonstrated his ability to shave hides almost into tissue leather. With this implement at his command and a new process in his possession, an American inventor claims that he can split a pig skin to the fineness of a cologne bottle-stopper cover and manufacture that article at a ridiculously low price. He can make the finest of 'imported' kid-glove stock, can displace oiled paper with a better and a cheaper article and do the same with the fine texture of rubber goods now used for waist shields. A hog hide can be treated so finely and split into so many separate skins as to astound the uninitiated. With this prospect before it, the hog skin has a right to come off and to expect much, in the near future."

showers, the seed falls on a smooth surface, and much of it never sprouts, or if it does, its roots have only a slight hold in the soil, and the first hot dry weather withers and kills it. When seeding on the spring crop which follows the corn, if the land was not entirely clean after harvesting the corn crop, we have it fall-plowed; but if clean we leave it and simply go on it in spring with spring-tooth cultivator and work it finely to a depth of two or three inches; then harrow it and sow the grass seed behind the drill, and again harrow, or, what we think is still better, roll and then harrow. We do not sow the grain too thickly—about 1½ bushels of barley or 2 bushels of oats per acre. We sow about six quarts of clover and two quarts of timothy seed per acre. We find that much of the timothy seed fails when sown in the spring; still, we always sow some, but we do not care for a great deal of it in the clover. After the grain is harvested, if we find patches in the field where there is a poor catch, we sow on some more timothy seed and run the smoothing harrow over it; then when the rains come it usually comes on and fills up the bare spots, which would otherwise grow to weeds. A top-dressing of rotted barnyard manure scattered over the poorer spots in the field before sowing the spring grain is a great aid in securing a clover catch. Clover seed is comparatively cheap this spring and it should be sown very liberally. We believe that it is one of the greatest aids in securing and maintaining fertility that the farmer can employ. For milch cows it has few equals, and we have this season wintered our horses on clover hay and oat straw, without any grain or bran, as it seems to take the place of both when horses are mainly idle; and our hogs and chickens are also very fond of it. Of course, our land is all tile-drained, which is very important on most soils.

E. F. AUGUSTINE.

Lambton Co., Ont.