

high temperature, then ground, screened, and placed in 100-pound bags for shipment. Owing to the dryness of the product, there is practically no danger of fermentation taking place.

It having been claimed that the increased use of this material for hogs was the cause of the increase in the number of tuberculous hogs condemned at the abattoirs, inquiries were sent out by the writers to State experiment stations where tankage had been fed to hogs experimentally to see if any case of tuberculosis had developed as a result of such feeding. Experiments were also carried on by this Bureau along the same line. In no case could tuberculosis be shown to have arisen from the consumption of tankage, and it must therefore be absolved from all blame in the spread of this disease, and may be looked upon as a safe and valuable article of food for use in raising and fattening swine.—(U. S. Dept. of Agriculture Bulletin, Tuberculosis of Hogs.

### How the Forest Helps the Farm.

Whether forests increase the amount of precipitation within or near their limits, is still an open question, although there are indications that under certain conditions large, dense forest areas may have such an effect. At any rate, the water transpired by the foliage is certain, in some degree, to increase the relative humidity near the forest, and thereby increase directly or indirectly the water supplies in its neighborhood. This much we can assert; also, that, while extended plains and fields, heated by the sun, and hence giving rise to warm currents of air, have the tendency to prevent condensation of the passing moisture-bearing currents, forest areas, with their cooler, moister air strata, do not have such a tendency, and local showers may therefore become more frequent in their neighborhood. But, though to increase in the amount of rainfall may be secured by forest areas, the availability of whatever falls is increased for the locality by a well-kept and properly-located forest growth. The foliage, twigs and branches break the fall of the rain drops, and so does the litter of the forest floor, hence the soil under this cover is not compacted as in the open field, but kept loose and granular, so that the water can readily penetrate and percolate; the water thus reaches the ground more slowly, dripping gradually from the leaves, branches and trunks, and allowing more time for it to sink into the soil. This percolation is also made easier by the channels along the many roots. Similarly, on account of the open structure of the soil and the slower melting of the snow under a forest cover in spring, where it lies a fortnight to a month longer than in exposed positions, and melts with less waste from evaporation, the snow waters more fully penetrate the ground. Again, more snow is caught and preserved under the forest cover than on the wind-swept fields and prairies.

All these conditions operate together, with the result that larger amounts of the water sink into the forest soil, and to greater depth, than in the open fields. This moisture is conserved because of the reduced evaporation in the cool and still forest air, being protected from the two great moisture-dissipating agents, sun and wind. By these conditions alone, the water supplies available in the soil are increased from 50 to 60 per cent. over those available on the open field. Owing to these two causes, then, increased percolation and decreased evaporation, larger amounts of moisture become available to feed the springs and subsoil waters, and these become finally available to the farm, if the forest is located at a higher elevation than the field. The great importance of the subsoil water, especially, and the influence of forest areas upon it, has so far received too little attention and appreciation. It is the subsoil water that is capable of supplying the needed moisture in times of drouth.

Another means by which a forest belt becomes a conservator of moisture is its wind-breaking capacity, both velocity and temperature of winds being modified, and evaporation from the fields to the leeward reduced.

On the prairie, wind-swept every day and every hour, the farmer has learned to plant a wind-break around his buildings and orchards, often only a single row of trees, and finds even that a desirable shelter, tempering both the hot winds of summer and the cold blasts of winter. The fields he usually leaves unprotected, yet a wind-break around his crops to the windward would bring him increased yield, and a timber belt would be still more effective.

Not only is the temperature of the winds modified by passing over and through the shaded and cooler spaces of protecting timber belts disposed toward the windward and alternating with the fields, but their velocity is broken and moderated; and since, with reduced velocity the evaporative power of the wind is very greatly reduced, so more water is left available for crops. Every foot in height of a forest growth will protect one rod in distance, and several belts in

succession would probably greatly increase the effective distance.

On the sandy plains, where the winds are liable to blow the sand, shifting it hither and thither, a forest belt to the windward is the only means to keep the farm protected.

In the mountain and hill country the farms are apt to suffer from heavy rains washing away the soil. Where the tops and slopes are bared of their forest cover, the litter of the forest floor burnt up, the soil trampled and compacted by cattle and by the patter of the rain drops, the water cannot penetrate the soil readily, but is carried off superficially, especially when the soil is of clay and naturally compact. As a result, the waters, rushing over the surface down the hill, run together in rivulets and streams, and acquire such a force as to be able to move loose particles, and even stones; the ground becomes furrowed with gullies and runs; the fertile soil is washed away; the fields below are covered with silt; the roads are damaged; the water-courses tear their banks, and later run dry because the waters that should feed them by subterranean channels have been carried away in the flood.

The forest cover on the hill-tops and steep hillsides which are not fit for cultivation prevents this erosive action of the waters by the same influence by which it increases available water supplies. The important effects of a forest cover, then, are retention of larger quantities of water, and carrying them off under ground, and giving them up gradually, thus extending the time of their usefulness and preventing their destructive action.

In order to be thoroughly effective, the forest growth must be dense, and, especially, the forest floor must not be robbed of its accumulations of foliage, surface mulch and litter, or its underbrush by fire, nor must it be compacted by the trampling of cattle.

On the gentler slopes, which are devoted to cultivation, methods of underdraining, such as horizontal ditches, partly filled with stones and covered with soil, terracing and contour plowing, deep cultivation, sodding, and proper rotation of crops must be employed to prevent damage from surface waters.

All the benefits derived from the favorable influence of forest belts upon water conditions can be had, without losing any of the useful material that the forest produces. The forest grows to be cut and to be utilized; it is a crop to be harvested. It is a crop which, if properly managed, does not need to be replanted, it reproduces itself.

When once established, the axe, if properly guided by skillful hands, is the only tool necessary to cultivate it and to reproduce it. There is no necessity of planting, unless the wood-lot has been mismanaged.

The wood-lot, then, if properly managed, is not only the guardian of the farm, but it is the savings bank, from which fair interest can be annually drawn, utilizing for the purpose the poorest part of the farm. Nor does the wood-lot require much attention; it is to the farm what the work-basket is to the good housewife—a means with which to improve the odds and ends of time, especially during the winter, when other farm business is at a standstill.

It may be added that the material which the farmer can secure from the wood-lot, besides the other advantages recited above, is of far greater importance and value than is generally admitted.

Wire fences and coal fires are, no doubt, good substitutes, but they require ready cash, and often the distance of haulage makes them rather expensive. Presently, too, when the virgin woods have been still further culled of their valuable stores, the farmer who has preserved a sufficiently large and well-tended wood-lot will be able to derive a comfortable money revenue from it by supplying the market with wood of various kinds and sizes.

In regard to the manner in which the farmer should manage his wood-lots, with varying conditions, the methods would, of course, vary. In a general way, if he happens to have a virgin growth of mixed woods, the first care would be to improve the composition of the wood-lot by cutting out the less desirable kinds, the weeds of tree-growth and the poorly-grown trees which impede the development of more-deserving neighbors.

The wood thus cut he will use as fire-wood, or in any other way; and even if he could not use it at all, and had to burn it up, the operation would pay indirectly by leaving him a better crop. Then, he may use the rest of the crop, gradually cutting the trees as needed, but he must take care that the openings are not made too large, so that they can readily fill out with young growth from the seed of the remaining trees, and he must also pay attention to the young aftergrowth, giving it light as needed. Thus, without ever resorting to planting, he may harvest the old timber, and have a new crop taking its place, and perpetuate the wood-lot, without in any way curtailing his use of the same.

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### Street Sweepings as a Fertilizer.

In a United States Department of Agriculture Bulletin on "City Street Sweepings as a Fertilizer," by J. J. Skinner and J. H. Beattie, a record of several experiments is given, and the following conclusion arrived at:

The application of street sweepings to soils will undoubtedly have a beneficial effect and be a factor in building up the land. The possible danger of a harmful effect from the oily substance which it contains must, however, be considered. If the oil could be economically extracted, this danger would be averted. The oil in the debris for the first year or two may not have any effect, but a continuous application to a field year after year may eventually impair its productiveness, unless through drainage or other natural agencies the oily material is drained off or changed. In some localities this is probably the case, as the use of such material is still said to be effective, although it has been applied for a number of years. No very definite field information on this point is, however, at hand. In this connection, attention must be called to the fact that the presence of an unusual amount of oil in such street sweepings has been the result of automobile traffic, and hence appears only in recent years as an appreciable factor in the use of street sweepings as fertilizer, and it is not improbable that the amount of oil will even further increase in the next few years.

Aside from the physiological action of the oily material here mentioned, there are probably other more strictly physical effects, due to the coating of soil particles and consequent interference with normal moisture movement and solubility of the mineral soil constituents.

Vegetable or animal oils undergo changes in soils under the influence of soil organisms, but so little is known concerning the action of organisms on the strictly hydro-carbon oils that no statement concerning the possible disappearance or change of this oil in street sweepings can be made.

Some 200 agricultural societies and several thousand individual members are this season engaging in the Ontario field-crop competitions, under the superintendence of J. Lockie Wilson, of the Department of Agriculture at Toronto. About 100 judges and others attended the meeting at the Agricultural College, Guelph, last week, to devise a more uniform system of scoring. The Dominion Government was, by resolution, memorialized to amend the Seed Control Act so that all bags or packages in which alfalfa seed is offered for sale will be plainly and indelibly marked with the name of the Province, State or country where the contents are grown.

Prof. S. A. Bedford, of the staff of the Manitoba Agricultural College, has been appointed Deputy Minister of Agriculture for that Province, as successor to J. J. Golden, who will hereafter devote himself exclusively to immigration work. Prior to his connection with the Provincial Agricultural College, Prof. Bedford rendered many years' valuable public service as Superintendent of the Experimental Farm at Brandon, and it would have been difficult to find a man for the deputyship possessing so practical and varied a knowledge of Western agriculture in all its phases.

Under what is known as the "Junior Imperial Migration League," 40 or 50 lusty boys, mostly from 18 to 21 years old, picked up in Old London, were landed in Toronto last week and distributed to Ontario farms. A number of men of means are backing the movement, which is aided by the Ontario Department of Agriculture.

Recent changes in Chinese political and commercial organization are increasing the sales of typewriting machines in that country which we used to designate glibly as "The Flowery Kingdom." The rifle and the typewriter are two standard accessories, or, should we say, modes of "civilization."

It is understood that the visit of Prof. G. E. Day, Live-stock Husbandry Department, Ontario Agricultural College, to Great Britain for the purchase of foundation stock for a Provincial herd of milking Shorthorns, has been deferred because of the recent outbreak of foot-and-mouth disease in England.

Prolonged drouth, which has been a cause of recent anxiety in the West, has been broken by fairly copious rains.