

for the main difference in the feeding of animals and plants is that the former moving about on the face of the earth take in masses of food, which they at their leisure dissolve by the acids secreted from their internal membranes, or we will call them skins, and absorb through the system such dissolved material; while the plant being fixed in the earth pushes its roots through the masses of food, dissolving them by its acids secreted from the outside membrane, and then absorbs the dissolved material; consequently, as some plants have stronger acids than others they can utilize and assimilate more insoluble food. This in the animal kingdom is instanced in the dog, which can dissolve insoluble bones merely cracked up with his strong teeth, the cattle which can dissolve rough fodders and grains, and man, who finds it easier to dissolve cooked food and ripened fruits.

TOBACCO CULTURE.

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The substance known as tobacco consists of the leaves of a narcotic plant, a native of South America, belonging to the order *Solanaceæ*, and known to botanists as *Nicotiana glauca*. Its use is more general and widely spread than that of any other narcotic or stimulant; it is largely manufactured for smoking, is also prepared for chewing, and is used to a more limited extent as snuff. Specimens of this plant were first brought to Europe in 1558 by Francisco Fernandez, a physician who had been sent by Philip II of Spain to investigate the products of Mexico. While tobacco first came to Europe through Spain, the habit of smoking was initiated and spread by English example, and Sir Walter Raleigh was one of the devotees to the use of this weed who helped to bring it into prominence. During the seventeenth century its use spread with great rapidity among all the nations notwithstanding the resolute opposition of statesmen and priests, and penal enactments of the most severe description.

There are other species of tobacco grown to a limited extent in other parts of the world, but the tobacco produced on the American continent and in Cuba is all made from the species referred to. The tobacco plant is a coarse, rank growing annual, which attains a height of from four to six feet, crowned with a panicle of pink flowers and having alternate leaves which are very large, often attaining a length of three feet or more and a proportionate width. Although this plant is a native of South America it flourishes over a very wide area, and adapts itself to many different climates. It is grown in most of the Southern and Middle States in the neighboring republic, and its cultivation is rapidly increasing in Canada. The tobacco plant is very susceptible to variations in climate and soil, not only are the size and texture of the leaves so influenced, but the quality, strength and flavor are thus affected in a remarkable degree. During the long period this plant has been under cultivation many different varieties have been produced, but the finer qualities of high flavor are grown chiefly in tropical countries

with a comparatively dry climate. The seeds of the high flavored sorts, such as are grown in Cuba, when sown in the cooler climates of the Eastern States or Canada produce plants of much less flavor and of a different texture. Nevertheless, many useful commercial varieties can be grown in the cooler climates of this country.

The census of Canada in 1891 shows a total product in all the provinces of 4,277,936 pounds, of which about 90 per cent. was grown in the Province of Quebec. Most of this crop was cultivated in small areas, rarely exceeding a few acres on any one farm. Recently the cultivation of tobacco has increased very rapidly in Western Ontario, especially in the county of Essex. Walker Sons, of Walkerville, were among the pioneers in this industry, and have for some years past had the largest tobacco farm in the Dominion. In 1897 they had 130 acres under this crop. A considerable number of farmers in the neighborhood of Leamington, Ont., have of late entered on the cultivation of this plant, growing from 5 to 20 acres each. It is estimated that about 1,000 acres of land were devoted to the growing of tobacco in that part of Essex in 1897, and that about 40 car-loads of cured leaf were shipped from that district. It is believed that a much larger area will be planted during the coming season.

SOIL AND ITS PREPARATION.

The soil most suitable for a tobacco crop is a deep rich friable loam, dry and warm, which can be easily worked up into a fine and mellow condition. While a rich sandy soil is usually preferred, the crop often does equally well on a loamy clay, provided it is of such a porous and open character as will admit of its being brought into a fine condition of tilth; tobacco does not usually succeed well on a heavy clay. When grown on the heavier classes of soil the plants produce a thick leaf, more suitable for the manufacture of chewing tobacco, and when grown on lighter, sandy soils a thin or light leaf more suitable for the making of cigars. The tobacco plant grows very rapidly and is a gross feeder and needs an abundant supply of plant food, hence, in the preparation of the soil for this crop barn-yard manure is used very liberally. About thirty-two horse loads, or more, per acre are applied during the winter or early in the spring and ploughed under. Subsequently the land is harrowed—usually with a disc-harrow—from time to time until the soil is thoroughly and finely pulverized to a depth of about three inches. Wood ashes may also be freely used with much benefit to this crop.

SOWING THE SEED.

Tobacco seed is sometimes sown in hot beds, sometimes in cold frames and occasionally in open ground. The first method has been practised at the Central Experimental Farm at Ottawa, and is the plan usually followed in the Province of Quebec, but in Western Ontario, where the season is longer, although hot beds are frequently used, the sowing of the seed in cold frames and open beds is not uncommon.

In preparing a hot bed select a southern or south eastern exposure sheltered on the north, and dig out a space 5 feet by 12, or any required length, to the depth of 18 inches.

Place 3 or 4 inches of straw in the bottom and cover with fresh manure from the horse stable to the depth of 8 or 10 inches treading it down well. Cover with good rich loamy soil to a depth of 4 or 5 inches, and pack it firm. Allow this to stand for a few days to heat up and then rake the bed smooth, when it will be ready to receive the seed. Where a hot-bed is used, the seed may be sown in rows from 4 to 6 inches apart, or broadcast, having previously been mixed with ashes or corn-meal so as to ensure more evenness in sowing. If sown broadcast the surface should afterwards be pressed firmly by placing a board, about one foot wide and nearly the length of the bed, on the surface of the newly sown ground, and walking over it, then move the board so as to press another foot, and so on, until the whole bed is evenly pressed. Then cover with frames either glazed or covered with cotton to protect from cold and frost and sprinkle the surface often enough with water or weak liquid manure to keep it moist. Germination takes place in about ten days, and in from twenty to thirty days after the plants appear, they should be large enough to transplant.

Where the seed is sown in cold frames or open beds, a sheltered position is desirable, with a southern exposure. Upon the plot selected, brush is usually burnt until the soil is made hot enough to kill the seeds of grass and weeds near the surface. When the soil has thus been baked to the depth of about half an inch and the bed has cooled, the surface is stirred with hoe or spade to the depth of two or three inches. Well-rotted manure is then spread over the ground and raked and worked until it has become thoroughly mixed, and the whole made mellow and fine. Mix carefully one tablespoonful of seed with about a quart of ashes and sow broadcast. This quantity is sufficient for a bed ten feet square, and should furnish plants enough for an acre of land. Brush or rake the seed in very lightly and use a light roller to make the surface compact, smooth and even, or press the surface smooth with a board in the manner recommended for the sowing in hot-beds. Use cotton covered frames or cover with light brush thick enough to afford some shade to the young plants and to protect them from drying winds, and water from time to time as needed to keep the ground moist. Keep the plants free from weeds and thin them out where necessary to avoid crowding. Sometimes the seed is sprouted before sowing. This may be done by mixing it with some fine mould and placing it near a stove or in some other warm place and keeping it moist for four or five days. Sow it as soon as it can be seen to have sprouted. By adopting this plan some time may be saved, but it is not generally recommended. The time of sowing will vary in different localities, ranging in Canada from the 1st to the 15th of April, and the young plants will be ready to put out from the 25th of May to the 10th of June. The seed bed should be large enough to permit of a sufficient number of plants of the same size being taken from it to complete the planting of the desired area at one operation, so that the subsequent

growth may be even and regular. There should also be a surplus left sufficient to fill the vacancies caused by failure.

PLANTING.

The plants are usually put out in rows about four feet apart and from two and a half to three and a half feet apart in the rows. Where practicable, the rows should run north and south so that each plant may get the largest amount of sunshine. The places for the plants in the rows are usually indicated by running over the ground with a corn marker. Some prefer to ridge the ground before planting, and claim that subsequent cultivation can be carried on with less injury to the plants where this method is practised. If the ground be flat or heavy this plan is preferred, but on lighter soils with good drainage the plants may be successfully grown either with or without ridging.

When the plants in the seed bed are four to five inches high and the largest leaves from two to two and a half inches wide they are ready for the field. Before any are lifted the bed should be thoroughly sprinkled with water so that the earth may adhere to the roots. A cloudy day after a shower of rain is preferred for transplanting, but if the plants are carefully removed with a ball of earth attached to the roots of each they may be set out with fair success, provided the ground is reasonably moist, without waiting for such specially favorable conditions. Small plants should not be used, it is better to wait a few days until they are of the proper size. When planting a basket of plants is carried by a boy up between the rows when one is dropped at each side where indicated by the marker, the men follow and put them in the ground, using a planting peg or the finger for this purpose, pressing the earth carefully about the roots. Where the plantation is very large, a planting machine is sometimes used. Messrs. Walker Sons use the Bemis' planter, by which with one pair of horses, driver and two men to tend the machine, about twenty thousand plants may be set per day.

Some experiments have been tried at the Central Experimental Farm as to the effects of twice transplanting. The plants were pricked out from the hot-beds to cold frames, where they were set in rows eight inches apart, and about three inches apart in the rows, and after they had grown strong and stocky they were transplanted to the field. It was observed that when treated in this way the plants grew more rapidly and there were fewer failures in planting than when they were transplanted directly from the hot-bed to the field. The yield of leaf was also larger. When transplanting from the beds the thinning should be so carried out as to give the remaining plants more room and thus permit of a spreading stocky growth.

(To be continued)

The best and only thing to do when your horse is excited is to calm him down. This is best done by getting to the horse's head and talking to him gently, rubbing his face and otherwise diverting his attention from the subject of his fright.