

LOSSES DUE TO RATS MILLIONS ANNUALLY

Of all Animals Rat is worst
Pest, says Writer

From the Ninth Annual Report of the Commission of Conservation, the following extract showing the pernicious habits of rats and mice is taken:—

The destructive powers of rats and mice are well known, but the manner in which their presence is tolerated in city and country would indicate that the immense losses they cause are not fully appreciated. Of all animals, the rat is the worst pest. As a carrier of bubonic plague, it is a serious menace to public health; as a destroyer of grain, stored foods of all kinds, eggs, chickens, and other food products, it is unequalled. And yet no serious efforts are made to cope with this powerful enemy in our midst.

Bubonic plague is transmitted from rats to human beings by fleas. The destruction of rats is an essential step in the protection of communities from this disease. In the fourteenth century, it is estimated that about 25,000,000 people died in Europe from the "black death," as this disease was called, and 2,000,000 deaths are stated to have occurred during the epidemic of plague in India in 1907. Modern methods of preventing the spread of plague involve the most vigorous eradication of rats.

But we are concerned now with the destruction of food by rats, which, as I have stated, is not sufficiently appreciated. In Europe, it was estimated in 1907, after a full inquiry, that the average annual loss caused by each rat in Great Britain equalled \$1.80, in France \$1, and in Denmark \$1.20. The losses in the rural districts in Great Britain and Ireland due to rats in the same year were computed at \$73,000,000; and a capital of about \$10,000,000 was employed in the industry supplying means to destroy rats. At the present time, the English Board of Agriculture is making special efforts to combat the rat pest in England. Mr. E. W. Nelson, Chief of the Biological Survey of the United States Department of Agriculture, in a recent valuable article on the rat pest, estimates the annual losses in the United States due to rats to equal at least \$200,000,000. He further makes the interesting statement that in order to feed and otherwise provide for this enormous destructive army of rats the labour of 200,000 men is required.

When the prolific habits of rats are taken into account the extent of the menace they constitute will be made still clearer. The brown rat begins to breed when about three or four months old; they breed from six to ten times a year and produce, on the average, ten young in a litter. If we imagine a pair of rats breeding at this rate for three years without any deaths among their progeny, at the end of that short period the number would be increased to over 350,000 rats.

The main reasons for the abundance and destructiveness of rats and mice is that we provide food and shelter for them. To combat them successfully, we must refuse them both these vital essentials. Shelter should be denied by making buildings and other haunts rat- and mice-proof by various constructional methods. Seed grain, provisions, etc., should be stored in rat-proof containers. The adoption of sanitary conditions in towns and cities, cleanliness about stores, warehouses and other buildings will help to eradicate them. The maintenance of garbage dumps is one of the greatest causes of rat abundance; incineration is the only sanitary method of treating garbage. Systematic campaigns should be organized and such methods of destruction as trapping, poisoning, and hunting with ferrets and dogs should be adopted wherever rats occur.

Soldiers' Settlement.

Soldiers' Land Settlement in Canyon City District (B.C.), is progressing satisfactorily and 100 settlers will be working on clearing operations by September 1, says a report to the Winnipeg office of the Department of Immigration and Colonization.

NATURAL REPRODUCTION OF PULP SPECIES SLOW

Report states that it takes about 40 years for Young
Spruce to acquire diameter of one inch and 100
years to make a six-inch tree.

The following is an extract from a report on an investigation of the reproduction and growth of the pulpwood species after logging in Quebec, carried out by Dr. C. D. Howe, of the Forestry staff of the Commission of Conservation. The object of the investigation, according to the report, was to determine the condition of cut-over lands with respect to the regeneration and rate of growth of the present pulpwood-producing species, namely, spruce and balsam, with a view to estimating the future crop:—

"The result of the investigation," it is stated in the report, "show that the optimistic attitude of lumbermen and limit holders in regard to the reproducing power of this type of forest is not justified. The good yields of pulpwood material at the end of each of the several cuttings in the past thirty years do not represent the amount of growth accrued during the intervals between cutting periods, but are obtained by cutting successively smaller trees, and, in general lower grade material and also by including a larger proportion of balsam in each cut. For example, the spruce stumps were measured and classified according to the age of the cutting on sample plots, totalling 50 acres, and the results are here stated: In cuttings from 15 to 20 years old, the average diameter of the stumps was 15 inches; cuttings 10 to 15 years old, 12 inches; while in cuttings less than 10 years old, the average diameter was 11 inches. This shows a reduction of 4 inches in the average diameter of the trees taken within the past 15 to 20 years. The actual reduction, however, is doubtless greater, since the measurements record the present diameters of the stumps without making allowance for reduction in size by decay in the past two or three decades.

The tallying of the stumps on the sample plots showed the following increase in the proportion of balsam cut for pulpwood: On areas lumbered earlier than 15 years ago, no balsam was cut. In cuttings from 10 to 15 years old, 65 per cent and 35 per cent, respectively, were spruce and balsam. In cuttings 5 to 10 years old, 45 per cent of the stumps were spruce and 55 per cent balsam, while in cuttings less than five years old, the proportion is 22 per cent spruce to 78 per cent balsam.

The casual observer is in danger of being misled if he bases his prediction of an abundant future crop of pulpwood upon the number of young spruce and balsam trees beneath the forest. The amount of future pulpwood material, and the time of harvesting the crop, depend as well upon the rate of growth exhibited by the young trees now present.

RATE OF GROWTH.

Over 2,000 trees were analyzed to determine their rate of growth in diameter, height and volume. While the results of this study have not yet been tabulated, they have gone far enough to justify the statement that within the forest type under consideration, it takes about 40 years for the little spruce trees to acquire a diameter of one inch; 100 years to make a six-inch tree, and 150 years to reach the minimum diameter limit of 12 inches, established by the cutting regulations in Quebec, for white and black spruce. Balsam grows somewhat faster. A one-inch tree is made in about 16 years, and it takes in the neighbourhood of 70 years to reach the Quebec diameter limit of seven inches at two feet from the ground.

These statements refer to the time required, under the given conditions, to make a merchantable forest from the seedling stage onward. It will be seen from the foregoing table that there are

30 spruce and 59 balsam trees from 4 inches to 8 inches in diameter already present on the average acre. They will furnish another crop of pulpwood material in time, but here again the time is long. The growth tables show that it will require about 70 years for the 4-inch trees and about 50 years for the 8-inch trees to reach the 12-inch diameter limit. The larger balsam, however, will be merchantable in 10 years or less.

CUTTINGS MUST BE DELAYED.

There are only six spruce and six balsam trees over eight inches in diameter, on the average acre in this culled forest. This number is too small to justify exploitation alone, so that the next cutting must be delayed until a sufficient number of the smaller trees reach merchantable size. Just how long this will be can not be determined until our figures are more completely digested, but we have certainly gone far enough to disprove absolutely the frequent assumption that such lands can be cut over every 20 years and the same amount of material secured as before. On these heavily-culled lands, it will probably be found that, henceforward, a period of from 30 to 60 years must elapse between cuttings, if only spruce and balsam are to be removed.

It is, of course, obvious from the foregoing that one of the fundamental problems most urgently demanding solution is some method of utilizing the very large quantities of hardwoods, principally, yellow birch. If these could be removed, the rate of growth of the spruce and balsam would be accelerated, since the heavy overhead shade would thus be greatly diminished, making more light available for the pulpwood species. As long, however, as the tendency of every cutting operation is to convert the area more and more into a hardwood forest, as is now the case, the problem is exceedingly difficult, if not wholly impossible, of practical solution. Much further investigation will, of course, be necessary before final conclusions can be drawn as to what modifications are necessary in the silvicultural treatment of these forests, which have now become so valuable.

WILD LIFE AIDS IN PROTECTION OF CROPS

The greatest enemies to our food crops are insect pests, which attack the plants both below and above ground. Of all natural agencies tending to keep in check such pests and to suppress outbreaks, the many species of insectivorous birds play a very important role. Without the aid of these most valuable allies in destroying the enemies of our crops, our food production would be most seriously affected by the unrestrained ravages of the ever-increasing number of pests to which crops of all kinds are subject. The protection of insectivorous birds is at all times a necessary measure in crop production.

In addition to the assistance rendered by insectivorous birds, other members of our wild life render valuable help in the protection of our food crops by destroying insect pests and such other enemies of crops as field mice and gophers. Skunks destroy large numbers of insects; moles and shrews perform a similar service. Hawks and owls kill countless numbers of gophers and mice. The value of the lower forms of animal life, such as snakes, frogs, and toads in destroying crop pests is not generally realized, but, at the present time, it is very desirable that their usefulness in this direction should not be overlooked, as stated in an article in the Ninth Annual Report of the Commission of Conservation.

Women should save through W. S.S.

MILLION ACRES OF FREE LANDS TAKEN UP BY SOLDIERS

That total has practically been
reached in Four Western
Provinces during past year
says Report.

PORCUPINE RESERVE

Approximately one million acres of free lands in the four Western Provinces have been taken up by returned soldiers in the past year. The Soldier Settlement Board reports that up to the 1st of August, 3,768 soldier grant entries have been made in the four Western Provinces, as follows: Manitoba, 858; Saskatchewan, 1,124; Alberta, 1,702; British Columbia, 84. At 160 acres each this means 602,880 acres. About two-thirds of these soldiers have also exercised their right to take up homestead land. This means that 2,512 veterans have taken an additional 160 acres, amounting in all to 401,920 acres; the total being 1,004,800 acres.

The British Columbia free grant lands are those situated along the line of the C.P.R., which were turned over by the province to the Federal Government at the time of the construction of the C.P.R. Transcontinental railway.

The number of soldier grant entries in July was 941, and in June 813. The Porcupine Forest Reserve in Saskatchewan was opened in July and about 150 soldiers have already settled there. Reports as to the agricultural possibilities of this district are very satisfactory. The Reserve is 50 miles east of Tisdale, Sask., and only twelve miles from the railway. Within six weeks engineers will have completed a motor road to the townsite of Prairie River. A steel bridge to be placed over the Red Deer river is on the way, and timber for a bridge over the Copeau river has been purchased. The Forest Reserve is really park land and consists of open spaces and bluffs of poplar and willow. The crops in the surrounding district are good. The soil is a rich black loam from 18 inches to 3 feet deep and absolutely free from stone. It is so rich that wheat cannot be grown successfully for the first three years, as the wheat keeps on growing until the frost gets it; but if heavy crops of oats are taken off the first three years, wheat matures early enough. There are many valuable hay meadows and pea-vine is very thick and over 7 feet high. This grows about three tons to the acre and is worth \$15 a ton at the railroad.

Commercial Uses of Birch.

The bulk of the birch lumber sold is sweet birch (*Betula lenta*), and this is the material that is largely used for hardwood flooring and furniture. Yellow birch (*Betula lutea*) has a wider range of distribution, is used for wood distillation and often substituted for sweet birch. White birch (*Betula alba*, var. *papyrifera*) is the commonest species of the three, but does not usually grow to timber size and is of little commercial value, being used for turnery, spools and small woodenware. Birch is Canada's most abundant hardwood and is rapidly gaining in favour as the supply of the more expensive hardwoods is exhausted. It is fairly hard and strong with a fine grain; it is easily worked, takes a high polish and can be stained to imitate more expensive woods like mahogany, cherry or walnut. "Wavy" birch is an accidental form due to cross-grain, somewhat similar to "curly" maple, and is highly prized for ornamental work. Birch is difficult to season, being apt to shrink and check, and is very perishable. This material is also largely purchased in the province, about nine-tenths of the supply being bought in Ontario. Two-thirds of the remainder is brought from the United States, and consists mainly of sweet birch from Tennessee. Some sweet and some yellow birch are bought in the eastern provinces, as stated in a bulletin issued by the Forestry Branch, Department of the Interior.