

\$5.00 sample to contain a startling percentage of fowl seeds, and undoubtedly low in vitality; whereas the \$7.00 sample was practically free from fowl seed, and standing high in vitality—the seed which it would have paid him many times over to have purchased. "Whatsoever we sow, that shall we also reap." I. C.

Crop Rotation, Grasses and Clovers.

Address given at the joint live stock and grain growers' conventions Brandon.

No one will deny that judging by the inspection returns the production of hard wheat is falling off and while the reasons for such conditions are debatable, it is fair to assume that the decline is not due to any one cause.

Investigation seems to show that decline in hard wheat production is due 1st. to inferior seed, either from immaturity, impurity or degenerate varieties; and, prevalence of weeds, especially wild oats; and 3rd., decline in fertility, exhaustion of the soil nitrogen, burning up of the humus and, therefore, inability to retain the proper amount of soil moisture. The assumption is warranted that the first cause is in a fair way to be removed by the seed fair and its practical demonstrations; the two other causes cannot be as pointedly demonstrated before you, each one will need to picture to himself the appearance one farm will present worked solely for wheat production, and another worked under system of crop rotation.

Great Britain is the only country in the modern world to-day possessing a century old agricultural system which we consider worthy of imitation, and the reason she occupies that pre-eminent position is due to the system of crop rotation followed, rendering possible the keeping of live stock, an occupation so perfected there as to make the tight little isle, the exemplar and Mecca for all who would engage in the breeding of good stock to-day. Crop rotation besides the benefits, it undoubtedly confers on the land worked under that system, also renders active the brain of the man who follows its scheme, and consequently gives to the country better crops and broader minded men. Crop rotation means more than maintenance of fertility. It means an increase in Nature's storehouse, and so one might continue endlessly.

A rotation to be acceptable must not overlook the staple crops. It must provide for a maximum quantity of such being grown with a minimum call on the soil's resources, and also leave the land in good shape for following crops. Rotation may be divided into three sections dealing with (a) the cereals; (b) the grasses or clovers; (c) the use of manure. The last one is the renovator; the grasses and clovers—renovators and way-payers if fed on the farm; the cereals are pocket fillers, some by selling off, some by feeding on the farm.

The grasses,—we may include under that category native rye and timothy, brome should not be included in a rotation. The only legitimate place for brome is as a permanent pasture grass; its other qualities render it unacceptable. Neither rye nor timothy, are in themselves testorative enough, unless fed on the land and returned as manure, despite the fact that a certain amount of fibre is put in the land by their growth. Improvement is frequently noticed by sowing down to grass, and the weeds are kept in check; but in the clovers and that other legume pease lie the solution of the problem, because by their growth, is restored to the land that essential to the growth of hard wheat—namely nitrogen. No rotation can be considered either satisfactory or complete without the inclusion of the legume, and the best all-round one to use on a sufficiently large scale is clover—either the ordinary red, (*Trifolium pratense*) or the mammoth, (*Trifolium pratense perenne*).

The following rotation seems likely to suit best Manitoba conditions; wheat, oats, barley, wheat and seed down, hay, hay or pasture and break up. Under this rotation, a selling staple is produced three years out of seven; a staple oats, part available for sale, the remainder for feed one year; and another staple, barley, to be fed entirely, and two hay crops, of which a small quantity may be sold, or a large portion marketed either as dairy products or as beef.

It will be noticed that, wheat is followed by oats, the reverse order has been proven by experiment to be unsatisfactory. Wheat follows barley, because that great pork making cereal has aided in cleaning the land and allowed early fall plowing for wheat.

If seeding down is done with barley an advantage in growing a crop of wheat on clean soil is lost. I believe in seeding down with wheat, using red clover five pounds (if well matured, high colored bold seed) and four pounds of timothy. Should the winter kill the clover, the timothy will stand. Sowing the clover with wheat, so that it gets an early start, and with a broadcast attachment to the front of the seeder. If one has plenty of horses at seeding time, it might be advisable, especially if the land is weedy, to sow the grass seed crosswise after the wheat is up, and harrow immediately the way of the grain. Pease is not included, because as yet, such is not a staple crop, in the sense that there is not a market for that grain, neither is it grown for feed, although it might be feasible on spring plowed, well discing sod to grow pease successfully, drilling in deep at the rate of 2½ to 3 bushels, with two pecks of oats per acre. If one does not care to use pease on the land treated as mentioned, corn should be planted, manuring heavily if a timothy or rye grass sod; either crop, pease or corn are valuable as preparation for wheat. Owing to the scarcity of labor, rush of work, and returns got, roots cannot be included in the rotation, although their value for feeding purposes is considerable but the cultivation necessary is rarely given in this country.

In North Dakota, flax is considered a staple crop, and is usually sown after corn at the rate of ¼ a bushel per acre, the yield running from ten to twenty-five bushels, on an average seventeen bushels. The price is usually a remunerative one the demand for the oil being likely to increase, the drawback to this grain being the difficulty of securing clean seed.

Bishop Harker Gives His Alfalfa Experience.

To the Editor:

Having been asked by your valuable paper to give my experience in the growing of lucerne or alfalfa, I cheerfully do so hoping that some one will profit by my mistakes. In the first place the land should be thoroughly prepared. I think a good summer fallow is not too good; especially if the alfalfa is to be grown without irrigation. The land should be plowed deep as the roots are fine and tender, and if the fine roots reach the hard subsoil it stops the growth until the roots get strong enough to penetrate; and if the plowing is shallow the plants will not do as well, and are liable to dry out and die. I would not sow a nurse crop but give the young plant all the advantage it can have; if the weeds come the first year they should be clipped off with the mower. This will also strengthen the roots of the plants, my alfalfa is mixed with timothy and I cut two tons to the acre last year for my first crop; I expect yet to cut three tons per acre the first crop and one and a half to two tons the second crop. My experience is that the alfalfa is the hay for this country and we will yet see alfalfa shipped by the carload to parts of the country that are not so well adapted for this kind of hay. I would advise every farmer to try a small patch and in so doing we will each one help the other to make a success of growing the best hay that can be grown for the work horse, the milk cow and the sheep; and make good pasture for the pigs

and poultry. Now if I have said anything that will cause one farmer to plant and make a success of a small patch of alfalfa, I shall feel that I have been well paid for my efforts. The Alberta farmer will never be the independent man he should be if he has to buy hay, but if we all grow alfalfa the people in the cities will want our hay, our beef, our mutton and butter that comes from this rich plant.

Magrath.

LEVI HARKER.

What About Burning Stubble?

EDITOR FARMER'S ADVOCATE:

The Special Seed train came and went, leaving on the mind the impression of a panorama. It was met by the largest number of farmers the speakers had the pleasure of addressing in their trip.

Each speaker dealt with his subject in a clear, practical manner, nothing new, however, being brought out. The value of such a meeting, like revival meetings and reviews in schools, consists in making ideas already learned permanent. Experience is the great teacher for the farmer as well as every one else. He has to come forcibly up against smut and weeds and see his bread and butter endangered before he will mend his ways. A discussion arose when one of the speakers advised burning the stubble to kill the wild oats and other fowl seeds.

It was contended that burning stubble was no easy matter; although if done, would be a valuable means of destruction. A few farmers were of the opinion that the land was robbed of fertility by burning stubble and one farmer went so far as to say that he had had proof of it on his own farm. Is there anything in this?

So long as a big acreage is the main object, instead of a love of clean and intelligent farming just so long will weeds grow and flourish.

Crystal City, Man.

S. H.

(Ed. note: Stubble may be of benefit to crops in two different ways, it may effect the soil chemically and physically. Chemically it adds plant food which is liberated by the decay of stubble and if burned, unless the ashes blew away, would be just as effective as though it decayed, so that from the standpoint of the chemist there is little loss in burning stubble. Physically stubble makes soil more porous and pliable and is particularly beneficial in heavy clays. In all soils it is valuable in retaining moisture so that from the standpoint of the physicist burning would be a distinct loss. From the standpoint of the farmer, who is both chemist and physicist a good deal would depend upon the condition of the soil. If it were in need of humus to make it more retentive of moisture or to make clays friable the stubble should not be burned, but if the soil were already full of decaying sod or manure the loss would not be noticeable.)

Rendering Grain Immune to Smut.

The letter appearing over the signature Tully Elder appears to me as a new light on what is the main pursuit of us farmers, the producing of grain. Does not the continued use of chemicals on these soften them, thereby causing the complaints we read, and at the same time, by inuring them to it, in time lose its effectiveness, a tendency plentifully evidenced last year? Does not Tully Elder's careful farming prove the possi-



FARMER'S ADVOCATE

STOCK JUDGING SCHOOL, SASKATOON.

In the background is the river and the east bank of the river, known as Capital Hill.