

run through the country districts, and the municipalities can then take up the matter and extend the power from these high-voltage lines. Subscribers having had experience with this power are invited to give our readers the benefit of their experience through these columns.—Editor.]

### Pea - and - Oat Hay.

Unless next spring and summer turn out unexpectedly favorable, many farmers in Ontario and other parts of the continent will be confronted with the prospect of a scanty hay crop. Thousands of fields of new seeding were burned out by the blazing drouth of last midsummer. Many were plowed up, while others were left with a very weak stand. Unusual interest will, therefore, be taken in the various crops commonly recommended as substitutes for the ordinary hay and pasture, grasses and clovers. For grazing, many of our readers will doubtless try Prof. Zavitz's annual pasture mixture of 1½ bushels of oats, 30 pounds Early Amber sugar cane, and 7 pounds red clover. On the soil at Guelph this mixture has certainly produced remarkable results. Whether it would give equal satisfaction on heavy clay, is a point concerning which we would welcome the testimony of readers.

As crops to produce winter forage, Professor Andrew Boss, of Minnesota, recommends that old and well-tried stand-by, oats and peas, or even oats alone. Two bushels of oats and one-half to one bushel of peas, are the quantities he suggests. Such a mixture, grown in 1911 on a farm where quackgrass investigations are under way, produced two and a half to three tons per acre of cured hay, relished by horses and cattle, and especially valuable as sheep feed. Millet and fodder corn are also commended. "The Farmer's Advocate" is convinced that, in the search for new forage crops, many farmers go further and fare worse than if relying upon peas and oats. At Weldwood, last summer, we cut with the mower a load or two of this mixture, which had been sown about half and half, with a view to threshing. The prevalence of bindweed induced us to cut early, at a stage about half way between blossoming and maturity. Notwithstanding that a succession of sprinkles prolonged the curing process to about a week, this mixture made very appetizing winter feed, relished, apparently, about as well as good timothy hay. And, by the way, the cattle did not seem to object to the bindweed twined about the stalks.

Of course, as dry-weather forage crops, ensilage corn and alfalfa make an ideal combination, but where these have not been provided for, or where it is desired to supplement them, we strongly recommend peas and oats, sown early, either two-thirds oats and one-third peas, or even half and half, depending somewhat upon the variety of peas one uses. Too large a proportion of peas sometimes pulls the oats down, making them hard to harvest. In this connection, we may refer to the claim of the Cornell authorities, that oats grown with peas have a rather higher protein content than where grown alone. At all events, the mixture is most excellent. If not used for hay, it may be ripened and threshed. We add Henry's analysis of oat-and-pea hay, compared with timothy and clover:

	Digestible Protein	Digestible Carbohyd's	Digestible Ether Ex.
Oat-and-pea Hay .....	7.6	41.5	1.5
Timothy Hay .....	2.8	42.4	1.3
Red Clover .....	7.1	37.8	1.8

### Clover Growing Benefits.

Attention is called, in a recent bulletin (by T. L. Lyon and J. A. Bizzell) of the New York College of Agriculture, to a "heretofore unnoted benefit from the growth of legumes such as clover and peas. It is well known that such crops, when vigorous and abundant, exercise a beneficial effect on the soil and on succeeding crops. But that a legume may benefit a non-legume growing with it, by causing the non-legume to contain a larger quantity of nitrogen or protein, seems never to have been ascertained. The trials in question at the Cornell University Experiment Station with timothy, growing with alfalfa, timothy growing with red clover, and oats growing with peas, show that the timothy and oats contain more protein than when grown alone. The yield of the mixed oats and peas, when cut for hay, was considerably greater than the yield of oats alone.

The increased value of the non-legume, due to its greater nitrogen content, when grown with a legume, is of some economic importance. A method for increasing the protein content of certain forage crops by growing them with legumes is thus suggested.

The increased supply of available nitrogen, which these results indicate to be due to the presence of the legume, must have a very important influence on the yield of the non-legume on soils

where nitrogen is the limiting factor in the growth of the crop.

Soil on which alfalfa had grown for five years contained more nitrates than did soil which had grown timothy for the same length of time. Sections of these same plots kept bare of vegetation for the summer gave similar results.

The rate of nitrification of ammonium sulphate was greater in alfalfa soil than in timothy soil, thus indicating an influence of the plant on the conditions favoring nitrification. The higher protein content of non-legumes growing with legumes than of the non-legumes growing alone, is probably due to the more active nitrification caused by the presence of the legume.

### Time Records at Weldwood.

One of the first things done at Weldwood was to devise a system of time-cards, by means of which a record could easily be kept of the amount and value of time spent on the care of every class of stock; the production, harvesting and marketing of every crop; and the making of every improvement effected. Simplicity was sought above everything else, for very few farmers have bookkeepers to assist them, and very few farm hands would be capable, even were they willing, to enter into the details of a complicated system. In the first cards used, we attempted to carry out partially the idea of R. J. Case.

HORSE Time Card for week ending Dec 2, 1911		
Date	Hrs	Job
Sunday		
Monday	18	Trip for telephone poles
	18	Trip for straw
Tuesday	4	Trip to Lambeth for chop

The nitrifying power of a soil which grew alfalfa for five years, and which was then kept bare of vegetation for a summer, was greater than that of adjacent plots on which timothy had been grown for the same length of time, and which was likewise kept bare for a summer. This indicates a benefit arising from the influence of the legume on the rate at which nitrification goes on in the soil, even after the crop has been removed.

Alfalfa grown on soil in need of lime contained a higher percentage of protein when lime was added to the soil than when none was added. The weed *Erigeron annuus* growing with the alfalfa possessed a higher protein content when grown on the limed soil. Ammonium sulphate, when added to the limed and to the unlimed soil, nitrified more rapidly in the former.

the New York State fruit-grower, whose time cards were illustrated in "The Farmer's Advocate" last winter. Mr. Case had a separate column for every branch of his business—apples, peaches, etc. It was soon perceived, however, that it would require too large a card to provide a column for every farm job of which separate account was desired, so that we soon modified the card to provide a column each for work on cattle and horses, leaving one column for all other work, and a space to the right in which to specify the job. Each man employed keeps such a record. Sometimes, in the case of unlettered or merely casual employees, the foreman keeps the card for him. Thanks to the example and influence of the foreman, who appreciates the purpose of the time-cards, no difficulty has been experienced in persuad-

Time Card for week ending Dec. 2, 1911.				
Date	Cattle Hrs	Horses Hrs	Other work Hrs	Specify job in each case.
Sunday	5			
Monday	3			
			6	took grain to mill & brought load of straw
			2	general chores
Tuesday	2		1	unloading straw
			1	general chg respig
			1	cutting up pig
			1	work on feed cart
			4	putting up poles for telephone

The greater protein content of a non-legume when grown on a soil containing sufficient lime, as compared with one deficient in lime, is apparently due to the more abundant formation of nitrates under these conditions.

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ing the men to co-operate in this matter, though we realize that in some cases there might be a little. Also, a card is kept for the horses, whose time is computed on the basis of one horse per hour. If a team is employed ten hours hauling gravel, the horses are credited with twenty hours of horse time. If four horses are used nine hours at plowing, it is put down as thirty-six hours of horse time, and so on. As all our horses are of approximately the same weight and working capacity, separate account is not kept for each horse.