New York Agricultural Experiment Station.

POPULAR EDITION

OF

BULLETIN No. 118.

ALFALFA: ITS VALUE, CULTURE AND USE.

APRIL, 1897.

GENEVA, N. Y.
BOARD OF CONTROL.
GOVERNOR BLACK, Albany.
WILLIAM C. BARRY, Rochester, Monroe County.
S. H. HAMMOND, Geneva, Ontario Co.
MARTIN V. B. IVES, Potsdam, St. Lawrence Co.
A. C. CHASE, Syracuse, Onondaga County.
F. O. CHAMBERLAIN, Canandaigua, Ontario Co.
F. C. SCHRAUB, Lowville, Lewis Co.
NICHOLAS HALLOCK, Queens, Queens Co.
LYMAN P. HAVILAND, Camden, Oneida Co.
G. HOWARD DAVISON, Millbrook, Dutchess Co.

OFFICERS OF THE BOARD.
MARTIN V. B. IVES, President.
W. O'HANLON, Secretary and Treasurer.
S. H. HAMMOND,
W. C. BARRY,
F. O. CHAMBERLAIN,
F. C. SCHRAUB, Executive Committee.

STATION STAFF.
W. H. JORDAN, Sc. D., Director.
L. L. VANSLYKE, Ph. D., Chemist.
WM. P. WHEELER,
S. A. BEACH, M. S., First Assistant.
VICTOR H. LOWE, B. S., Horticulturist.
*F. A. SKEHRINE, M. S., Entomologist.
*F. C. STEWART, M. S., Entomologist.
FRANK H. HALL, B. S., Mycologist.
GEO. W. CHURCHILL, Editor and Librarian.
AGRICULTURIST AND SUP'T OF LABOR.

WENDELL PADDOCK, B. S., Assistant Horticulturist.
C. G. JENTER, Ph. C., Assistant Chemist.
A. L. KNISELY, M. S., Assistant Chemist.
†W. H. ANDREWS, B. S., Assistant Chemist.
J. A. LE CLERC, B. S., Assistant Chemist.
†A. D. COOK, PH C., Assistant Horticulturist.
C. P. CLOSE, B. S., Clerk and Stenographer.
FRANK E. NEWTON,

Address all correspondence, not to individual members of the staff, but to the NEW YORK AGRICULTURAL EXPERIMENT STATION, GENEVA, N. Y.
The Bulletins published by the Station will be sent free to any farmer applying for them.

*Connected with Second Judicial Department Branch Station.
†Connected with Fertilizer Control.
ALFALFA: ITS VALUE, CULTURE AND USE.

F. H. HALL.

This valuable legume, or clover like plant, is known also as lucerne and botanically, as *Medicago sativa*. It has spread by successive steps from its probable native home in the West Asian valleys to Greece, Rome, the latter's Mediterranean colonies, Mexico, South America, California and our western mountain and prairie states. As lucerne, it was raised in New York about eighty years ago, but, possibly because not acclimated or thoroughly "at home," it did not seem specially valuable. Its remarkable success in the West has again attracted attention to its merits and the culture of the crop is rapidly extending.

Feeding value. It has grown well at the Station for several years and has yielded heavy crops of very nutritious fodder. Experiments in feeding alfalfa to milch cows were made in 1894, and, as reported in Bulletin No. 80, the results were very favorable. The added experience of 1895 and 1896 strengthens the good opinion then formed of this fodder, as rations containing larger or smaller amounts of alfalfa have been efficient and economical.

Comparison with corn. Farm animals of all kinds find the fresh material very palatable, as much so as corn; and it is much richer in the nitrogenous, or muscle forming, matters than is corn. It thus supplements admirably the nitrogen-poor corn ration and supplies the lacking ingredient in a highly relished form. As compared with the

---

*This is a brief review of Bulletin No. 118 of this Station on Alfalfa, by W. P. Wheeler. Anyone specially interested in the detailed investigations will be furnished, on application, with a copy of the complete Bulletin.*
mature fresh corn fodder fed at the Station, the alfalfa forage contains a little more moisture, ash, fiber, and fat; much less starch and similar compounds; but nearly one and one-half times as much of the nitrogenous protein, and of this protein about 77 per cent is in the form of easily digestible albuminoids.

Yield. Alfalfa will furnish three or more cuttings each year; and, from fields at the Station from one to three years old which have hardly attained their prime, and on soils not thought to be best adapted to heavy growth, the average yield of green fodder from five crops of four cuttings each was over seventeen tons per acre. This yield and its food value as compared with high average yields of other prominent forage crops of the farm are graphically shown below:

The blocks at the left represent by their width the comparative relations between the total crop yields, the shaded portions show the relative amounts of digestible matter in the yield and the black areas are proportionate to the quantities of digestible protein.
Habit of growth. Alfalfa lives many years, the root retaining its vigor and the crown rapidly sending out new shoots when the upright, branching stems are mowed off. The tap root is strong, extends from three to four feet into the soil, where it branches and the dividing roots with their abundant fibrous rootlets may reach a depth of twelve feet or more. This length and strength of root system enables the plant to obtain water and food from depths not reached by other crops and thus to avoid the evil consequences of drought and famine.

Like the other legumes, alfalfa bears in great numbers upon its roots the nodules or tubercles which contain the nitrogen-assimilating micro-organisms whose power to gain free nitrogen from the air renders so valuable this whole family of plants. This nitrogen-gathering power and the deep feeding of the plant make it a great soil improver. Where the crop is fed on the farm and the manure returned to the land as it should be, the fertility of the soil will constantly increase notwithstanding the heavy crops grown. The stubble and roots of a mature crop contain about thirty-five dollars worth per acre of the essential fertilizing constituents which have been brought from the depths of the soil or from the supplies in the air and stored up for the benefit of the succeeding crops.

Its needs. Alfalfa grows well on nearly all soils, except dense clay, if the subsoil is open and porous, preferring a somewhat sandy loam, warm and friable, with a liberal supply of lime, but frequently giving surprising yields even on poor, gravelly land. Stagnant water, moisture-saturated soils, or a permanent water level within a few feet of the surface is fatal. It responds remarkably to good feeding and will well repay applications of potash and phosphoric acid.

Seeding. Before sowing alfalfa the ground should be put in the best possible condition, so that a full stand may be secured. Care must be taken the preceding season to get rid of weeds as far as possible, as the young alfalfa plants are quite easily choked out if the weeds have a chance to start. Sow about thirty pounds per acre of selected, fresh, plump, pure seed in the spring after danger of severe frost
has passed, covering the broadcast seeding with a brush harrow; or drill in the seed and harrow lightly across the drill marks. June is probably as late as it is safe to sow, as the young plants require some months' growth to enable them to withstand the cold weather. The mature plants, however, appear hardy at Geneva, but may not be so much north of the central portion of the State.

Cutting. If weeds appear to be crowding the young plants run over the field with a mower, elevating the cutting bar sufficiently to avoid injuring the crowns of the young plants. Leave the clippings, if light, as a mulch to protect the crop during the dry weather. Frequently the alfalfa will make growth enough to allow of cutting one, or even two, crops the first year, but usually the first good yield will be that of the second year. The yield will increase for three or four years and then may remain constant for ten years or more, perhaps indefinitely; but ordinarily it will pay to plow up the field after six or eight years, as weeds are liable to work increasing injury.

Soiling, pastureage, silage, hay. Alfalfa should be cut every time it blossoms unless a seed crop is desired, and, if used for soil ing, on a field properly proportioned to the number of animals to be fed, a regular succession of cuttings of green fodder may be obtained. If fed in large quantities it should be allowed to wilt, as without this precaution it is liable to cause bloat. It is not safe for pasturage of cattle and sheep for the same reason, but horses and pigs are not likely to be injured. Alfalfa silage is said to have a disagreeable odor and taste; it is readily eaten by cattle and compares well in composition with clover silage. It has not been tested at the Station as the green forage has been in too great demand.

The hay is very nutritious and palatable, but requires care and favorable weather for making; as the leaves are easily lost when the hay is too dry and with the foliage disappears a large part of the valuable ingredients of the crop. Great deterioration takes place if the curing hay is exposed to rain, the stored product does not shed water well, and if put up damp is subject to mildew and mold.
Summary. From its adaptability to so many soils, its value as a conserver of fertility, its permanence when once established, its heavy yields, and its richness as a fodder, the Station is confident that alfalfa is well worth trial where the climate is not too severe.