

UNIVERSITY OF TENNESSEE

Agricultural Experiment Station

BULLETIN No. 30



VOL. VII.

DECEMBER, 1894.

No. 4.

DEHORNING CATTLE.

Notes to Correspondents.

Bulletins of this Station will be sent, upon application, free of charge,
to any Farmer in the State.

KNOXVILLE, TENNESSEE, U. S. A.

Bulletins of this Station will be sent, upon application, free of charge, to any Farmer in the State.

THE AGRICULTURAL EXPERIMENT STATION

OF THE UNIVERSITY OF TENNESSEE.

CHAS. W. DABNEY, JR., PRESIDENT.

EXECUTIVE COMMITTEE:

M. P. JARNAGIN,	JOSEPH W. ALLISON,
O. P. TEMPLE,	W. H. JACKSON,
HUGH G. KYLE.	

TREASURER:
JAMES COMFORT.

SECRETARY:
J. W. GAUT.

THE STATION COUNCIL IS COMPOSED OF ITS OFFICERS:

DR. CHAS. W. DABNEY, JR., President.
CHAS. F. VANDERFORD, Secretary.
R. L. WATTS, Horticulturist.
J. B. MCBRYDE, Chemist.
S. M. BAIN, Botanist.
C. E. CHAMBLISS, Entomologist.
CHAS. A. MOOERS, Assistant Chemist.

The Station has facilities for analyzing and testing fertilizers, cattle foods, milk and dairy products; seeds, with reference to their purity or germinating power; for identifying grasses and weeds, and studying forage plants; for investigating the diseases of fruits and fruit trees, grains and other useful plants.

The Station Bulletins and Reports will be sent, free of charge, to any farmer within the State.

Packages by express, to receive attention, should be *prepaid*.

All communications should be addressed to the

SECRETARY OF THE

AGRICULTURAL EXPERIMENT STATION,

KNOXVILLE, TENN.

 The Experiment Station building, containing its offices, laboratories and museum, and the plant-house and horticultural department, are located on the University grounds, fifteen minutes walk from the Custom House in Knoxville. The Experiment farm, stables, milk laboratory, etc., are located one mile west of the University, on the Kingston pike. Farmers are cordially invited to visit the buildings and experimental grounds.

Bulletins of this Station will be sent, upon application, free of charge, to any Farmer in the State.

DEHORNING CATTLE.

Every observant farmer and stock-breeder of experience knows that the law of heredity is as active and as powerful in domestic animals as in man. The gains or losses of one generation are passed on to succeeding generations. In the improvement of live stock by careful selection and breeding, the advance made in one generation may be scarcely noticeable; but when we compare our domestic animals with their nearest kindred in the wild state, man's influence is apparent. All animals, and indeed all organized bodies, develop such organs as are necessary to existence. This depends upon their environment. The wild boar develops a powerful, muscular neck, a long nose and large tusks that he may be able to plow up the soil and to dig up roots for a living. Add to this equipment long muscular legs, and he is armed for battle with his enemies. The horns of wild cattle are necessary weapons of defense and of offense in maintaining the struggle for existence. The farmer's cow is supplied with food; her owner is her protector; her horns therefore are no longer a necessity, and in many cases have been reduced to mere knobs or have disappeared entirely. But it is a fact that horned cattle are apt to find some use for their horns whether necessary or not, and therefore the natural process of dehorning is slow.

Since horns are of no real service to the cattle of the farmer or the herdsman, it is very desirable that they should be without them, for it has been observed that cattle without horns are peculiarly quiet and docile, are easily managed and are less liable to injure each other in their stalls. They are better fitted for stall-feeding, and fatten more rapidly than horned cattle. They are more easily, safely and economically shipped. Herdsmen on the prairies find it impracticable to shelter horned cattle from severe weather, thereby sustaining loss from their falling off in weight. Not only do horned cattle inflict injuries on others of the herd, but they sometimes attack man, and we frequently hear of the loss of human life from this cause.

Since polled cattle are much more desirable, and the process of dehorning by selection and breeding so slow, it is not surprising that many experiments have been made to determine if the horns can not with safety be cut off directly. This method was probably suggested by the fact that cows frequently break off a horn by accident, and with apparently no evil results.

The question whether or not cattle should be dehorned is either one of safety or economy, or both. If a cow is dangerous, and the removal of her horns will remove the danger, no one should hesitate. But questions of this sort are usually settled from the economic point of view. Castration is no less painful, but it is economy.

The Station management has work of this kind done from time to time, and the results published.

TIME FOR DEHORNING.—Everything considered, the best time for the operation is during mild weather in winter. There is then no danger from flies, and the animals can be better cared for. It is well to avoid an operation of this sort at any critical period in the life of a milch cow. Six weeks before and four weeks after calving, this operation should not be performed except under necessity. The dehorning of steers or stock cattle can be done any time in the year, but, if the conditions are not favorable, very great care is required to protect the wounds from flies.

In December, 1894, we had been waiting for suitable weather when, on the morning of the thirteenth, one of the native cows on the farm made a vicious attack on a valuable Jersey heifer: compound fracture of one of the heifer's legs was the result, and she had to be killed. As the fine weather had come, it was decided to dehorn the whole herd immediately. Accordingly, twenty cows and eight heifers were dehorned with the results given below.

METHOD OF FASTENING.—A strong stanchion is necessary. It can be constructed by setting two fence posts firmly in the ground two feet apart and four feet high. On these spike two pieces of scantling, two by four inches and two feet long, opposite each other and one foot from the ground. Near the top of the posts spike on two such pieces in a similar manner. Then place a scantling of the same breadth and thickness, and five feet long, vertically between the horizontals, putting a wooden pin through its lower end and the two horizontal pieces seven or eight inches from the right-hand post, so that the upper end of the vertical bar will be free to move from side to side between the posts. Place the vertical bar parallel with the posts and put a hole through it and the upper horizontals, so that it may be held firmly by a wooden pin, and the stanchion is ready for use. To fasten the cow, take out the pin at the top and let the upper end of the vertical bar fall back against the left-hand post. With a strong halter lead up the cow and put her head through between the right-hand post and the vertical bar. Bring up the bar and put in the pin. Wrap the rope of the halter once around the lower part of the stanchion, and draw the animal's head down firmly against the cross piece; hold or tie the rope, and the operation can begin.

THE OPERATION.—Dehorners or Clippers, any one of which is far superior to the saw, are now offered for sale, so that no one would think of

dehorning without some one of them. The most satisfactory instrument yet used at the Station farm is the Keystone Dehorner. After the animal is secured, adjust the clipper so as to cut one-eighth of an inch of the skin with the horn. When properly adjusted, bring the levers of the clipper together at one pull, without any wrenching of the handles of the instrument. For the other horn, do not move the cow's head; the operator merely changes his position, adjusts the clipper, and cuts as before. After the horns are off, put a handful of dry flour on each cavity, and release the animal. Keep in comfortable stables out of bad weather. They should be carefully protected from rainy, sleety or snowy weather until the cavities heal. Each individual animal should be carefully observed twice a day until healing is entirely complete, and the proper care given to any that may require it. Excessive bleeding may be stopped by bandaging a small bunch of cotton saturated with fresh pine tar, so as to cover the cavity and the whole wounded surface. The bandage should pass around the head.

Let it be carefully noted that every movement of those concerned in dehorning must be with quietness. No sudden movement of foot or hand should be permitted to alarm the animal. It is also advisable that each cow operated upon be taken away before another is brought to the stanchion, so that there will be no cause of fear.

OBSERVATIONS.—The temperature of each animal was taken before dehorning, and several times after the operation, as shown by the following table. The milk record is given for three periods of ten days each: the first extending from 1st to 10th December; the second, which includes the day on which the operation was performed, extends from the 11th to 20th, inclusive; the third period, December 21st to 30th:

NAME OF COW.	AGE.	BREED.	MILK PRODUCED IN POUNDS.			TEMPERATURE.			
	Years.		1st period— Before de- horning.	2nd period— Dehorning period.	3rd period— after de- horning.	Dec. 13, just before de- horning.	Dec. 14, 24hrs after de- horning.	Dec. 15, 52 hrs after de- horning.	Dec. 16, 76 hrs after de- horning.
Annie Signal.....	9	Jersey.....	266.75	257.25	269.68	101.4	103.4	102.4	102.0
Richland Daisy.....	7	Jersey.....	117.12	115.06	109.50	100.6	100.0	100.2	100.0
Deva.....	4	Jersey.....	73.81	77.50	85.93	101.4	101.8	101.6	101.2
Rinda.....	8	Native.....	201.75	190.62	204.81	101.8	102.0	102.0	101.6
Spotty.....	9	Grade Jersey...	62.37	98.00	133.00	101.4	101.4	101.0	.....
Eva.....	7	Grade Holstein	228.75	238.25	246.50	100.6	102.0	101.2	100.4
Diodia.....	7	Jersey.....	133.25	126.50	133.81	101.2	101.4	101.4	101.0
May.....	9	Grade Jersey...	95.25	94.68	105.19	101.2	102.0	101.6	101.2
Queen.....	15	Grade Jersey...	246.00	248.31	253.62	101.8	102.0	102.0	102.0
Filices.....	7	Holstein.....	225.12	210.50	210.06	101.2	101.8	101.6	101.4
Iuka.....	8	Jersey.....	88.50	77.00	86.19	100.4	101.0	100.8	100.2
Parker.....	9	Grade Holstein	Dry.	.....	.....	101.2	102.8	102.0	101.8
Mary.....	7	Grade Holstein	291.25	295.12	317.56	100.8	101.8	101.6	101.0
Roxy.....	3	Jersey.....	44.50	40.06	51.00	101.8	101.8	101.4	101.0
Belle.....	8	Grade Holstein	124.37	126.00	121.43	101.2	101.8	101.4	101.4
Eleanor Albers.....	3	Jersey.....	59.12	55.62	62.31	101.6	103.0	103.0	102.2
*Aaggie Lucille 2d	6	Holstein.....	64.37	58.62	58.06	.....	.....	.....	.....
Gouldy.....	9	Native.....	164.12	165.00	159.62	.....	.....	.....	.....
Nannie.....	8	Native.....	160.87	141.37	167.00	.....	.....	.....	.....
Cheek's Fancy.....	4	Holstein.....	137.75	135.18	132.37	.....	.....	.....	.....

*Thermometer accidentally broken when taking temperature of Aaggie Lucille 2d.

Even a slight injury to a cow ordinarily results in a marked reduction of milk flow; but instead of a reduction in the yield of milk, as one would expect, during the second or dehorning period, we find by an inspection of the table that seven of the nineteen increased their yield, and during the third period twelve of them gave more milk than before the operation was performed.

The healing of wounds is always attended by more or less fever. As will be noticed, the rise of temperature was slight in nearly every case, and within three days after the operation the temperature was reduced practically to the normal. As the milk record and the temperature are both good criteria of the physical condition of a cow, we must conclude from the above table that the animals suffered no great pain and little disturbance in any way. Not one of the herd made the slightest cry of pain, but the operation was apparently somewhat more painful to young than to old animals, but with young ones the wounds healed more rapidly. At present, three weeks after dehorning, the cavities are all healed over and the animals are about well.

DEHORNING YOUNG CALVES, OR A METHOD TO PREVENT THE GROWTH OF HORNS.—The most satisfactory and painless method is by the application of certain chemicals to the embryo horns. Of the various preparations suggested for the purpose, caustic potash is the best that has been tried at the Station. When the calf is between twelve and twenty days old, clip the hair close over the embryo horn, wash the skin with warm water and soap to remove the oily secretion of the skin, moisten the end of a stick of caustic potash, (which can be purchased from any druggist,) and rub the exposed surface over the horn every thirty minutes until the skin becomes slightly sensitive and an incipient scab is formed. In about three weeks the scab will fall off, leaving the animal with a perfectly smooth poll. We have three young heifers that were treated in this manner more than a year ago, and there has never been the slightest indication of any evil effects therefrom. All the calves not intended for the butcher are treated in this manner, and we have not failed in a single instance to prevent the growth of horn. It is not necessary to rub the caustic on a space larger than a ten-cent piece. Care must be taken not to let the moistened caustic get on the hand. It is well to wrap the stick with paper, leaving only the end to be applied exposed. The calf suffers very little pain from the operation, and when we consider the advantages both to the animal and to the owner, there can be no doubt that it should be strongly recommended.

We conclude then, (1), that the horns should be cut off; (2), that the best dehorner only should be used; (3), that the greatest care be taken not to annoy or excite the animal by rough or sudden movements of those engaged in the operation; (4), that close attention and the very best care

should be given the animals until the cavities are entirely healed; and (5), that by proper treatment throughout the animals suffer very little and are greatly benefitted by the operation. But above all, we recommend (6), that the horns of calves be prevented from growing by an application on the embryo horns while the calf is very young,—between twelve and twenty days.

AS TO PLANT DISEASES.

We are undertaking a series of investigations as to the best methods of treating the fungous diseases of our various cultivated crops. In order to proceed intelligently with this work it is extremely important that we know just what diseases are most prevalent and are doing the most damage in various localities throughout the State. Such diseases are commonly known as "rust," "smut," "mildew," "blight," etc., and attack various parts of the plant. There is scarcely a crop of field, orchard, or garden that does not have some such enemy.

All that is necessary is to mail us in an envelope or small cardboard box some of the affected parts; roots, stems, twigs, leaves or fruit. Tell all you can about the history and appearance of the disease; when it first appeared, what parts seem to be affected, whether your neighbors' crops are similarly injured, and any other items that may suggest themselves.

SAMUEL M. BAIN,
Botanist.

DIRECTIONS FOR MAILING INSECTS.

In sending insects to the Station for information, it is very important that they should be properly secured and packed.

In mailing living specimens, and especially larvæ (caterpillars, grubs, etc.) the essential thing is a strong box, made as nearly air-tight as possible. A tin box is preferable, but a strong pasteboard one will answer the purpose. If larvæ are sent, they should be supplied with their proper food—that upon which they are found feeding—and *the tighter the box the fresher will the food as well as the specimens keep. Do not punch air holes in the box, for insects do not easily suffocate.*

When dead specimens are not pinned, they can be sent in many ways. I will recommend that such specimens be placed in a small pasteboard box, and packed in cotton so that rough handling will not damage them in any way.

Specimens in alcohol can be conveniently and safely sent in a vial, which must be placed into a piece of bored wood. To resist the shock of handling in the mail, the inside of this wooden tube must be lined with cotton, and its thinnest part must not be less than one-fourth of an inch thick.

Pinned and mounted specimens should be firmly fixed in a wooden box (a cigar box being excellent for the purpose) and this should be carefully but not too tightly wrapped with cotton or excelsior to a depth of an inch or more, and the whole enclosed within stiff wrapping paper. The box containing the specimens will be more secure if placed in a larger box, filling the intervening space, but not too firmly, with cotton or excelsior.

Entomological specimens are of the fourth class of mail matter, the postage on which is one cent an ounce or fraction thereof,—the maximum weight for the single package being four pounds, and the maximum bulk eighteen inches in any direction.

C. E. CHAMBLISS,
Entomologist.

DIRECTIONS FOR SELECTING, PREPARING AND SENDING CIONS.

It is essential that all cions or grafts sent the Experiment Station for test purposes be carefully selected and properly packed for mailing. The instructions given below should be closely followed:

1. Select strong, healthy wood of the previous year's growth.
2. Cut cions from five to eight inches in length.
3. If possible, send from six to ten cions of each variety desired, wrapping these in separate bundles, each carefully labelled.
4. Wrap each bundle in moss or a damp cloth, then enclose all the bundles in a large piece of damp cloth; cions must be quite uniform in length so the cloth will touch the ends. Wrap again with paper, binding with twine from end to end. Enclose with another piece of good paper on which the address with the sender's name and address should be plainly written. The sender's name and address should be in small letters on the left. Mail at once if possible. If not, keep package in cool place until deposited in post office.

R. L. WATTS,
Horticulturist.

GRASS SEEDS AND PLANTS.

The Station has established upon the farm a garden of perennial grasses for the careful test of such species and varieties as will probably be of value upon the various soils of the State. This garden was laid out in the fall of 1891; the first grass roots were set out November 13th, and by the first of May, 1892, the entire series of fifty plats were occupied by thirty-one varieties of perennial grasses. Each plat was carefully cleared of all weeds and of all other grasses except the single variety planted thereon. For certain varieties two plats were set apart, that experiments might be made as to the effects of fertilizers, of cutting at various stages of growth, etc. On nine of the plats a mixture of grasses, from four to six varieties, were grown from seed to test the probable value of

each when sown thus mixed. These plats have now been under observation nearly three years. Of the thirty-one varieties with which the experiments began, we have surviving twenty-two. Of this number we regard fifteen as being of such character and value as to deserve wide distribution throughout the State. Four grasses of special importance, because adapted to a wide diversity of soils and conditions, we have already distributed to various sections of the State. Seed of *Festuca rubra* var. *glaucescens*, (Tennessee Fescue, Glaucous creeping Fescue); of *Poa arachnifera*, (Texas Blue Grass); and *Poa compressa*, (English Blue Grass, Flat Stemmed Blue Grass), have been sown in small plats by a number of our correspondents. We have had few accounts of success from those to whom seed were sent. To some parties we have sent roots of these grasses, as well as roots of *Cynodon dactylon* (Bermuda Grass). From these we have, almost without exception, reports of success. We have, therefore, enlarged our plantings of the grasses above referred to, and will be ready this spring,—March 20th to May 1st,—to send to a limited number of applicants, or to as many as our supply will permit, roots of Texas Blue Grass, Flat-Stemmed Blue Grass and Tennessee Fescue. All three of these grasses are valuable additions to pastures in any part of the State.

CHAS. F. VANDERFORD,

Secretary.

Bulletins of the Agricultural Experiment Station of the University of Tennessee.

VOLUME I., 1888.

- No. 1.—History and Reorganization. Dehorning Cattle.
 - No. 2.—The Experiment Station, Building and Laboratories. Germination of Seed Corn. Analyses of Commercial Fertilizers.
 - No. 3.—Weeds of the Farm.
- First Annual Report, 1888.

VOLUME II., 1889.

- No. 1.—Notes on Fertilizers and Fertilizing Materials.
 - No. 2.—Diseases of the Irish Potato.
 - No. 3.—Cotton-seed Hulls and Meal as Food for Live Stock.
 - No. 4.—Grasses on Mountain Meadows and Deer Parks. Chemical Composition and Tests of Varieties of Strawberries.
- Second Annual Report, 1889.

VOLUME III., 1890.

- No. 1.—Experiments in Growing Potatoes.
- No. 2.—Tests of Varieties of Barley, Corn, Oats, Wheat and Sorghum; Methods of Culture of Wheat, and Effects of Fertilizers on Oats and on Clover.
- No. 3.—Points about Country Roads.
- No. 4.—Practical Experiments in Reclaiming "Galled" or Washed Lands, with Notes on Mulch and Mulch Materials.
- No. 5.—Fruit Trees at the Experiment Station.
- No. 6.—Index to Volumes I., II. and III.

SPECIAL BULLETINS.

- B.—Analyses of Commercial Fertilizers.
 - C.—Treatment of Certain Fungous Diseases of Plants.
 - D.—Potash and Paying Crops.
 - E.—The Cotton Worm. The Hessian Fly.
- Third Annual Report, 1890.

VOLUME IV., 1891.

- No. 1.—Crab-grass Hay. Sorghum as a Forage Plant. Test of Feed-value of First and Second Crop of Clover. Pasture Grasses. Black-knot of the Plum and Cherry. Pruning Fruit Trees. The Glassy-winged Soldier-bug. Diseases of Live Stock. Experiment Station Record.

- No. 2.—The Peanut Crop of Tennessee, Statistics, Culture and Chemistry.
 - No. 3.—The True Bugs, or Heteroptera of Tennessee.
 - No. 4.—Some Fungous Diseases of the Grape.
 - No. 5.—A Chemical Study of the Cotton Plant.
- Fourth Annual Report, 1891.

VOLUME V., 1892.

- No. 1.—Fruit Trees and Experiments with Vegetables.
 - No. 2.—The Grasses of Tennessee. Part I.
 - No. 3.—A Contribution to the Study of the Economies of Milk Production.
 - No. 4.—Experiments with Fruit Trees and Vegetables.
- Fifth Annual Report, 1892.

VOLUME VI., 1893.

- No. 1.—Some Injurious Insects of the Apple.
 - No. 2.—The Rational Use of Feeding Stuffs. Winter Dairying in Tennessee.
 - No. 3.—Small Fruits: Strawberries, Raspberries, Blackberries, Grapes.
 - No. 4.—Field Experiments with Tomatoes and Onions. The Boll-worm, Corn-worm, or Tomato-worm (*Heliothis armiger* *Hubn.*)
- Sixth Annual Report, 1893.

VOLUME VII., 1894.

- No. 1.—Grasses of Tennessee. Part II.
- No. 2.—Fruits: Grapes, Strawberries, Raspberries, Blackberries, Pears, Apples, and Peaches.
- No. 3.—Co-operative Experimentation.
- No. 4.—Dehorning Cattle. Notes to Correspondents.