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ALL DEPARTMENTS.

PRESS BULLETIN EXCERPTS.

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STILLWATER, OKLAHOMA.

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PRESS BULLETIN EXCERPTS.

EDITED BY F. A. WAUGH.

The Oklahoma Experiment Station issues two regular series of bulletins. One series is issued quarterly, and is mailed to all applicants in the Territory. The other series, designated as Press Bulletins, is issued monthly, and is mailed to the newspapers of the Territory and to certain agricultural papers throughout the United States. The quarterly bulletins endeavor to present, with considerable system and completeness, the definite results of special lines of work. The Press Bulletins give brief notes of such matters of current interest as do not seem to justify a more extended notice.

The issue of these Press Bulletins was begun in March, 1893, since which time there have been published fifteen numbers. The present bulletin, which belongs to the quarterly series, contains excerpts from these fifteen Press Bulletins. This publication is felt to be justified for two reasons: In the first place, many of the paragraphs published in the Press Bulletins, though brief, are of more than temporary interest, not to say of permanent value. It is thought well worth while to make them permanent and accessible in this form. In the second place, the matter presented in the Press Bulletins does not reach all of the readers of the quarterly bulletins. Press Bulletins are mailed only to the newspapers; and though the matter contained is widely printed, it is certain that very few of the papers use it all. The Home, Field and Forum, of Guthrie, which is a strictly agricultural journal, is the only paper which, to our knowledge, has printed all the matter. The objects of this bulletin are, then, to preserve the most valuable parts of the Press Bulletins, to put the matter in shape for reference, and to reach a new circle of readers.

It might be well to suggest that those who are interested in reading the Experiment Station notes as they are issued, should encourage their local papers to print more of the paragraphs. The Press Bulletins are sent monthly as copy for the newspapers especially to be printed by them for the general readers.

Department of Entomology and Botany.

J. C. NEAL, ENTOMOLOGIST AND BOTANIST.
A. N. CAUDELL, Assistant in Entomology.

No. 1.—MARCH, 1893.

RASCAL LEAF CRUMPLER, (Minneola indiginella.)—The farmer should at once look over his trees, gather and burn the bag worms, and clumps of leaves found clinging to the limbs that harbor the Rascal Leaf Crumpler, as well as various weevils and other injurious insects.

TWIG GIRDLER, (Oncideres cingulatus.)—If a limb is partly broken, look for the twig girdler, though, if there be a small hole near the break, it may be the borer beetle. In either case, cut off the limb an inch or so below the break, and in all cases burn the limbs.

BLIGHT.—Especially examine pear twigs, and if they show signs of blight, as becoming shriveled, or turning black, cut off the limbs and burn them.

PEACH BORER, (Sannina exitiosa.)—This most destructive enemy of the peach, plum, nectarine, apricot and cherry, should be looked after at once.

Look for the exuding "gum," or "sawdust," that betrays the presence of the worms, or larvae, and with a wire, or a sharp knife, follow the tunnels they make, killing all grubs found, then apply a heavy coat of whitewash, or better, use the following recipe:

Soak a pound of glue in water over night, then melt in a pan set in a vessel of hot water, add enough hot water to make two gallons of solution, and to this stir in a spoonful of Paris Green, or London Purple. When thoroughly mixed to an uniform color, paint the trunk, from the collar to the first branches. Then hill up the tree 6 or 8 inches, and pack the soil around the trunk tightly.

Dr. McCarthy, of the North Carolina Experiment Station, recommends this: Sour milk, 1 gallon; hydraulic cement, 5 tablespoonsful; mix, and with a brush or rag coat the trunk for a foot or more above the ground. During April the female moth lays her eggs on the trunk of the trees above mentioned, as near the ground as possible; the eggs hatch into grubs that soon burrow into the bark, and working downward often girdle the tree.

The cement makes a coating too hard for the worm, the glue destroys it, besides discouraging the attacks of "Brer Rabbit."

No. 2.—MAY, 1893.

SQUASH BUGS, (Anasa tristis and Diabrotica sp.)—The Oklahoma Experiment Station has lately received many complaints of insect pests, with request for relief. The cutworm family and the squash bugs seem to be the worst offenders, and really are difficult to manage. I recommend, for the various squash bugs, the use, in spray, of soap suds, to which has been added enough Paris Green to give a decided tinge of color to the solution. Older plants should also be hilled up to the first leaf. If the stems show signs of decay, it is from the presence of

the larvae, or maggots producing the squash bugs, and the vines should be pulled up and burned, without delay. The moths that are so common around the lamps, these warm evenings, are in most instances the perfect insects of some of the cutworm families, and should be destroyed.

CUTWORM (Agrotis sp.) TRAPS.—Into a pan pour an inch of water and a tablespoonful of kerosene. Into this set a lighted lantern, or lamp, and place where the moths can be attracted by the flame, and dashing down, fall into the oil and die. If this plan were pursued by our farmers persistently, in the early spring, for a few years, the cutworm plague would be a thing of the past.

No. 3.—JUNE, 1893.

LOCO WEEDS, (Astragalus mollissimus.)—The Oklahoma Experiment Station would be glad to get specimens of the so-called "loco weeds" when in flower. Wrap the plants in damp paper or cloth, then in several thicknesses of dry paper, tie securely, and address Dr. J. C. Neal, Director, Stillwater, Okla. If practicable, send also, full particulars separately on a postal card or in a letter.

No. 4.—JULY, 1893.

HORNFLY, (Hematobia serrata.)—The hornfly is again in the land and is causing considerable trouble among cattle. It will be remembered that the Oklahoma Experiment Station issued a special bulletin on this subject last year. In it was recommended the use of kerosene emulsion sprayed upon the cattle. They are now using on the cattle at the Station an emulsion made by dissolving three ounces of soap in three pints of water and adding one and one-half pints of kerosene. This mixture is agitated until an emulsion is formed, and is then diluted to make three gallons. When this is sprayed upon the cattle it keeps the hornflies away.

HORSE NETTLE, (Solanum rostratum.)—I would call the attention of the Oklahoma farmers to a plant that already shows a dangerous tendency to spread and become a pest. This is the horse nettle, bull nettle, or prickly potato. This vicious plant has leaves strongly like the citron melon, a yellow flower, and a stem thickly set with sharp, stinging spines. It should not be allowed to make seed, but should be cut off and a pinch of salt applied to the part remaining in the ground.

WORST WEEDS.—Many of the native plants of Oklahoma will dispute the right of the farmer to the land, and, if not properly treated, will become weeds difficult to subdue, and thus add greatly to the cost of culture. The Oklahoma Experiment Station at Stillwater will at an early date prepare a descriptive list of these noxious plants, and the Director invites correspondence from all parts of the Territory. Write him what are the worst weeds in your section.

No. 5.—AUGUST, 1893.

TEXAS CATTLE FEVER.—The return of Texas cattle fever to our Territory makes it practical to publish a resume of special bulletin No. 1 of the Oklahoma Agricultural Experiment Station.

I. PREVENTIVE TREATMENT.—It is well known that the mixing of cattle from the infected with those of the non-infected districts during the summer months, will probably result in an outbreak of the disease among the latter. It

is therefore clear that the cattle must not only be kept separate, but northern cattle must not be allowed to occupy a pasture previously used by southern cattle. It is now known that the cattle ticks transmit the disease in question. Destroy the ticks. This requires constant care and labor. They are readily killed with oils or any greasy substance mixed with sulphur, carbolic acid, creosote, or kerosene, thus: 1 pint lard, 2 oz. kerosene. This should be applied to those portions of the body attacked.

II. CURATIVE TREATMENT.—Medical treatment has not been satisfactory. With calves and yearlings we can expect a recovery, but with matured animals, especially if they are fat and of the Durham or Hereford breed, they usually die. The few that recover do not thrive. When the first symptoms of the fever appear, and these are easily detected by the listless attitude. the drooping ears, etc., give a tablespoonful of the following mixture in one-half pint of water: Salol, 4 oz.; Iodol, 1 oz.; Benzol, 4 oz.; Alcohol, 12 oz. Mix. The frequency of the dose will vary with the temperature, from 2 to 4 hours.

No. 6.—SEPTEMBER, 1893.

HINDOO BEAN, (Mochai Cottai.)—The results of the trials of the new forage plants at the Oklahoma Experiment Station show that it is probable that one or more of the crops grown in Hindostan will prove valuable acquisitions. Mochai Cottai, (Dolichos cultratus,) and Phaseolus aconitifolius have shown surprising growth and resistance to heat and drought. Some 54 new plants are now being tested at the Station in this experiment.

No. 8.—NOVEMBER, 1893.

TWIG BORER, (Amphicerus bicaudatus.)—A beetle that is found in apple, pear and quince twigs during the winter, has made its appearance at the Oklahoma Experiment Station, and the Director has ascertained it to be the apple twig borer, an insect that merely uses these trees as hiding places during the winter. It would be well to spray or wash the limbs and trunks of small trees with a solution of caustic potash, or concentrated lye, and thus, in a measure, render the trees obnoxious to the beetle. Use one box of lye to a common pail of water. It would also be well to cut off and burn twigs showing small holes in the bark.

CHUFA, (Cyperus esculentus.)—One of the best food plants for hogs, turkeys and chickens that has been tried at the Oklahoma Experiment Station is the earth-nut or Chufa. Without any cultivation whatever after planting, and on the poorest land on the farm, this plant yielded at the rate of 1,200 pounds per acre of delicate, sweet. nut-like tubers, that matured early in the fall and remained in the soil without loss till wanted. This food plant should be tried by every farmer raising hogs, as they only need to be turned into the Chufa field to do the harvesting of the crop. The meat from Chufa fed hogs has a rich flavor, and the fat is firm, making this food very desirable, and withal very cheap.

CHINCH BUGS, (Blissus leucopterus.)—Several hundred packages of infected chinch bugs were sent out this spring and summer to applicants, by the Oklahoma Experiment Station. From the reports sent in, one thing seems reasonably proven—that the infection does not spread if used during a drouth. In

several instances it seemed to act admirably, but only when used just before a rain. In view of the fact that much loss has resulted from the close contact of wheat and corn fields, rendering the migration of the chinch bugs an easy affair, I recommend the farmers of Oklahoma to place at least an interval of 100 feet between these crops. Then the space can be easily kept clean, and the farmer have the chance to prevent the transfer of the bugs from the wheat or oats to the corn or sorghum.

FLAT-HEADED APPLE BORER, (Chrysobothris femorata.)—At the Oklahoma Experiment Station this year, the flat-headed apple borer has done considerable damage. This beetle has been reported from every part of the Territory, and bids fair to be one of the enemies the Oklahoma orchardist will have to contend against. It is a little late to prevent the beetle from entering the trees, but it will be well for every one having an orchard to go over the trees and note the indications of the beetle, which are dark spots on the bark, usually on the southern side of the trunk. The remedy is to use the knife freely, following up the track till the borer is reached. This should be done without delay, as in a few weeks the beetle will bore to the center of the tree, where it will be out of reach.

No. 13.—APRIL, 1894.

SWEET CLOVER (Melilotus albus) made a good growth during the year, on the Experiment farm, and may become a fine forage crop for Oklahoma.

SAINFOIN (Onobrychis) also has stood both drouth and cold, and looks exceedingly well.

No. 15.—JUNE, 1894.

ROSE CHAFER, (Macrodactylus subspinosus.) The Rose Chafer, a long legged, grey-brown beetle, has been very troublesome to the grapes, apples and other fruit this season, and much complaint has been made to the Experiment Station. The insect having other food plants, such as the common sumach, will be hard to manage. Hand picking in the cool of the evening, or shaking off the vines or trees into a pan of kerosene is about the only thing that can be recommended at present.

FLEA BEETLE, (Graptodera.)—A small, steel-blue beetle is quite common, and is reported as being very destructive to young grape vines. This insect jumps like a flea when disturbed, and both the mature beetle and the larvae feed upon the leaves and the tender buds. Spraying with kerosene does but little good, but using a powder composed of one part strong insect powder and nine parts fine sulphur, dusting freely when the dew is on, or at dusk, gives good results.

GRAPE WORM, (Deilephila lineata.)—The larvae or worm stage of a pretty moth has done some damage in nurseries and vineyards this spring. This worm appears in two forms: one, yellow-green with small oval yellow and black spots on each side of the body; the other, nearly all black, with yellow spots and lines. Both forms have a horn on the hind end of the body. This is the white lined Sphinx, (Deilephila lineata), and will soon prune off all the young leaves, twigs and tender buds from a vine or graft. Fortunately it is easily seen, as it soon attains the size of three or four inches in length. Hand picking or snipping

in two with a pair of pointed scissors is perhaps the best method of meeting its ravages.

DIRECTIONS FOR THE USE OF THE CHINCH BUG INFECTION.—Prepare a tight box with a close fitting lid. Make of 1 inch stuff, 2 feet long, 3 inches deep, and 18 inches wide,

First, sprinkle the sides of the box till quite wet, then cover the bottom with two or three folds of damp cotton goods, then a layer of leaves of wheat, corn, oats, or sorghum.

Sprinkle the white, mildewed bugs sent you over the leaves, and then a pint or so of living, freshly gathered bugs from the field. Place the lid on tightly, set the box in a cool place, such as the cellar, bottom of a dugout, storm cave, or the shady side of a sod house. In four days the infection will be seen on the bugs as a white fungus or mildew. Take out the diseased bugs and scatter through the field, one or two bugs in a place, especially where the bugs seem piled up in the blades of corn or sorghum.

If a box cannot be obtained, I have had good success in using a half-gallon can. In the bottom place a damp cloth, then the diseased bugs, then the wheat, etc., then a pint of living bugs and seal tightly. Keep in a cool place for the four days.

As fast as bugs are taken out, they should be replaced with fresh ones, and those infected scattered over the field every other day for a week, or until it is seen that the bugs are dying in numbers. If the weather is not too windy and dry, this is certain to kill them very rapidly.

Later on, I earnestly advise you to gather up all the white, fungus covered bugs you can find, dry them in the shade on paper, and when dry, put in small tin cans, seal up with paper and keep in a cool place, where they will not freeze, for use next year. They will thus keep for a year, and by an early start in the spring, you will save time.

It will be remembered that this infection acts like mildew, rust, or the yeast plant, and that in dry, hot weather it may fail, just as yeast will sometimes fail, when the conditions for its spread are not favorable. With careful attention to these directions, after a rain or even a heavy dew, the chances are that the infection will do the work.

In case of failure, write me the conditions, and get a fresh supply with directions.

Each applicant must send me a box of live bugs. Send in a tight tin box by mail. Don't punch holes in the box. Put in some green wheat or corn leaves, but NO DIRT. Send, if possible, a pint of bugs. Put your name on the box, and send me a postal card giving your address.

HOG FOODS.—It is the intention of the Experiment Station to determine as far as possible the best crop to plant as food for hogs, especially in regard to quantity, quality and cheapness of pork produced.

Corn, wheat, chufas, African peanuts, artichokes, and sweet potatoes will be put in competition this fall, and tests made with all the safeguards possible to ensure thoroughly reliable results.

INSECT TRAPS.—A large number of old fruit cans were placed around the Experimental orchard early this spring, partly filled with sweetened water, and a prodigious number of May beetles, click beetles and other noxious insects were killed by this simple trap.

LOCUST, (Cicada septendecim.)—In various places in Oklahoma the XVIII brood of the 13-year locust (Cicada) has made its appearance, and where the orchard was near the place of emergence, the limbs of fruit trees were badly injured.

All the limbs showing punctures should be cut off and burned, which will lessen the damage that will occur in 1907.

OKLAHOMA WEEDS.—The following preliminary list is thought to include the most common weeds in the section around the Experiment Station, and perhaps it will answer for the greater part of Oklahoma.

Most of these are native to the prairie, but show staying qualities and a tendency to invade cultivated ground.

Achillea millefolium,	Yarrow.
Amarantus albus,	Tumble weed.
Amarantus blitoides,	Careless weed.
Amarantus retroflexus,	Careless weed.
Ambrosia psilostachya,	Prairie ragweed.
Amorpha canescens,	Wild indigo.
Andropogon provincialis,	Blue stem.
Apocynum cannabinum,	Dogbane.
Asclepiodora viridis,	Milkweed.
Baptisia australis,	Blue shoestring.
Baptisia leucophaea,	White shoestring.
Cassia Chamaechrista,	Sensitive Cassia.
Chenopodium album,	Lamb's quarter.
Cnicus undulatus,	Prairie thistle.
Croton monanthogynus,	Colic weed.
Cyperus strigosus,	Sedge.
Erigeron Canadensis,	Horse tail.
Euphorbia maculata,	Carpet weed.
Grindelia squarrosa,	Asthma weed.
Helianthus annuus,	Sunflower.
Lepidium Virginicum,	Peppergrass.
Oenothera biennis,	Evening primrose.
Oxalis violacea,	Sheep sorrel.
Panicum capillare,	Tickle grass.
Panicum Crus-Galli,	Barnyard grass.
Panicum sanguinale,	Crab grass.
Panicum virgatum,	
Passiflora incarnatum,	Passion flower.
Plantago Patagonica,	Hairy plantain.
Polygonum aviculare,	Knotgrass.

Polygonum Convolvulus	Bindweed.
Polygonum tenue,	
Portulaca oleracea,	Pursley.
Psoralea tenuiflora,	Sampson root.
Pyrrhopappus scaposus,	Oklahoma Dandelion.
Rumex crispus,	Dock.
Solanum rostratum,	Beaked Bull nettle.
Solanum Torreyi,	Bull nettle.
Vernonia Baldwinii,	Iron weed.

Especial attention is called to the Prairie thistle and the ragweed as being very aggressive, and hard to extirpate.

Pursely, Crabgrass, Knotgrass, Careless weed and the beaked Bull nettle are rapidly getting a place in cultivated land and will soon be pests if not attended to at once.

Department of Agriculture.

A. C. MAGRUDER, M. S., AGRICULTURIST.

No. 1.—MARCH, 1893.

OATS.—On comparing the test of nine varieties of oats grown at this Station last season with the same varieties grown at the Experiment Stations of Kansas, Missouri, Kentucky, Ohio and Illinois, it was found that the yield here was from one to nine bushels per acre greater than the average of the five states mentioned, and the weight of one bushel of grain was from one-half to five and one-half pounds greater in favor of Oklahoma.

Only in one case was the average yield of the five states greater than ours. This was in case of the variety "Black Tartarian," a very light oat weighing from 25 to 33 pounds per bushel, according to reports from the states used in the comparison. The same variety averaged four pounds heavier than our seed.

In connection with the oat test on the Station farm last season, it is observed in bulletin No. 4 as follows: "It may be said by way of explaining the general low yield of oats, and in fact all the crops grown this year on the farm, that, 1st, the soil is not considered so good as the average land of this section of the Territory; 2nd, the treatment which the oat land had received prior to our taking charge, was very imperfect. Part of the land was broken in June, 1890, part in June, '91, and all planted in corn in '92. The crop was gathered the following fall and soon after we took possession of the land as a part of the College Farm. No fertilizers, either commercial or home-made, were used."

No. 2.—MAY, 1893.

DITCHING FARM LANDS.—Ditching farms in Oklahoma is not thought by most of the farmers to be practicable. To the extent in which ditching can be done economically, however, this seems to be a mistake. Water which stands on a field, even for a few hours only after a rain is over, does more damage than good. For the most part the farm of the Oklahoma Experiment Station is a model as to ditches. Here during the recent heavy rains many practical points in the art of ditching were illustrated in a way that would interest any of the farmers. The points best emphasized were the need of a uniform fall and the danger of sharp curves in a ditch which has a considerable grade. In places where open ditches changed from one grade to another not so steep, large quantities of soil were deposited, soon filling up the ditch and causing the water to overflow the adjacent land. Where sharp turns are made it is found necessary to repair the ditch after every rain of any consequence.

GRASSES.—Station Bulletin No. 6 gives the results of one year's observations with forage grasses on the Station farm. About 100 varieties of grasses and clovers were grown there last year. Some of these have entirely failed to make a stand. This spring it is found that 41 out of the 73 species of grasses are entirely dead, 23 have done fairly well, and nine have done well. Besides a full discussion of these successes and failures, there will be given chemical analyses of first and second cuttings of prairie grass for hay. These analyses indicate that the second cutting is richest in food elements, especially protein. Analyses of cow peas cut for hay will also be given. These analyses show that cow pea hay is richer than clover or alfalfa, and so considerably better than prairie hay or Kentucky blue grass. An average of all the analyses made at the Oklahoma Station gives the composition to be: protein, 19.15 per cent.; fiber-20.58 per cent.; carbhydrates, 45.43 per cent., and fats 6.17 per cent. Comparing this composition with that of prairie hay analyzed at the same Station, it is found that one ton of cow pea hay is worth almost exactly three tons of prairie hay. Since 1 1-2 to 2 tons of cow pea hay to the acre is not an unusual yield, it will be seen that the value of cow peas as a forage crop is seldom over-estimated.

No. 4.—JULY, 1893.

GRASSES.—Drought and tame grasses do not go well together. Farmers have been trying for many years to find some good tame grass which would withstand the dry spells to which we are subject in the west. The recent dry, warm weather has tried tame grasses enough to show that some are weaker than others. Some of the tender ones have been nearly killed. In the experimental plats of the Experiment Station grasses sown this year show a vast difference in their drought-resisting qualities. Among those which are reported to have done the best thus far are Bermuda grass, Orchard grass, Awnless brome grass, Perennial rye grass, Lolium perenne, Italian rye grass, and Lolium Italicum. Among the clovers, alfalfa has stood dry weather best. Common red clover has done very well, Crimson clover made a splendid start, but has suffered severely during the late trying weather. All interested in this subject of tame grasses ought to write to the Experiment Station at Stillwater for the bulletin on grasses.

RUST AND SMUT.—Rusts of all sorts have been found this year on small grains in Oklahoma, though not in quantity enough to do any great damage. The Experiment Station reports smut and red rust on oats, black and red rust and stinking smut on wheat, and red rust on barley. Oats given the Jensen hot water treatment before sowing show much less smut than untreated plats. This experiment in prevention of smut, which will be reported more fully later, will be of great interest and may be expected to teach some practical lessons to our farmers.

No. 5.—August, 1893.

NON-SACCHARINE SORGHUMS.—The feeding of those sorghums included in the non-saccharine varieties is receiving due attention in the Experiment Station. Six varieties are being tested as to the amount of forage they will produce an acre. Each plat is divided into sub-plats and then cut at different stages of growth, allowed to grow up from the stubble and cut again. Analyses of first, second, and third cuttings will be made. The effect of second growth sorghum on cattle is also embraced in the plan of this experiment. The yields of the first cuttings in pounds an acre made when the stalks were from three to four feet high are as folows:

Yellow milo maize	Green,	4800;	Dry,	3660
White milo maize	"	6460;	"	4444
Kafir corn	"	4960;	"	3132
Jerusalem corn	"	1373;	"	1046
African millet	"	2910;	"	2152

It must be remembered that this is not the total yield of any one of the above varieties. The fourth sub-plat of each variety was left to mature and will greatly exceed the above yield. The second and third cuttings must still be added to the plats here reported to obtain their total yield. Again, the variety yielding the greatest number of pounds to the acre may not contain nearly so much nutritious food to the ton as some other. This can only be determined by analysis and actual feeding.

TREATMENT OF SOD FOR TAME GRASSES.—The experiment with grasses and clover on sod treated in different ways at the Station has been partially destroyed on account of having to use the land for general pasture for the Station stock, but even now, since the cattle have tramped over the plats for nearly a month, the Japan clover (Lespedeza striata) is taking the land nicely where it was broken and disked. The plat that was well harrowed after breaking shows well. It failed to "catch" on the sod that was only disked, as also on the sod that was merely harrowed, but where the sod was first broken, then well disked, it is making a good stand. This is one of the forage crops most appreciated in the South, and Lespedeza hay ranks well with timothy and peavine hay. One of its characteristics is its adaptability to poor soils. This clover with cow peas is bringing the worn out cotton fields of the South into a better state of fertility. It would be well if each Oklahoma farmer could learn a lesson of our southern brothers, and, instead of letting our lands be exhausted by the one crop system, making some restorative crops and commercial fertilizers necessary

in a very few years, begin now to grow crops that will maintain the soil's natural fertility and add more plant food to it.

COWPEAS.—Cowpeas planted on the Experiment Station farm the 13th of April ripened the 14th of July, the time from planting to maturity being just ninety-one days. The seed gathered on the 13th was planted on the 15th, and at this writing the vines are five and one-half inches high—seventeen days old. It is thought that these vines will mature peas this season. If they do, another laurel will be awarded the cowpea for being able to make two crops in one season. The variety making this record was the blackeye, a medium-sized, white pea with a black spot on what is known as the eye, hence the name. It is a runner, as is also the clay pea.

No. 6.—September, 1893.

GRASSHOPPERS do some damage at times, even when they do not come in flocks. The Experiment Station notes that some of the farmers who have been experimenting with cowpeas report the crop completely destroyed by grasshoppers during July. The trouble, however, has not been general.

BERMUDA GRASS planted this spring in the grass garden of the Department of Agriculture of the Oklahoma Experiment Station, is finely matted and stands twelve inches high. Dry, hot weather does not, seemingly, interfere with its growth.

COWPEA HAY is quoted in southern markets at ten dollars a ton, the same as timothy and red clover.

The horses and mules of the Experiment Station farm are fond of cowpea hay. The cattle of the Station leave corn and bran in their mangers when fed pea vines.

GRASS.—TEXAS MILLET.—The Texas millet grass on the Oklahoma Experiment Station farm has given good results, and bids fair to be one of the very few new grasses worth recommendation.

No. 7.—October, 1893.

AUSTRALIAN WHEATS.—New varieties of wheat to the number of twenty-nine, received from Queensland, Australia, will be entered in the experiments of the Department of Agriculture of the Oklahoma Experiment Station the coming year. Most of these new varieties are crosses made with a view to eliminate as far as possible the susceptibility to rust. Of the 250 varieties of wheat tested at the Station during 1893, the best will be retained and continued under test during 1894. These comparisons will be watched with interest. It is expected soon to issue a bulletin giving the results of this year's tests with extended comparisons of all the varieties grown on the Station grounds.

June 21st, 1894.—Note.—All Australian wheats winter killed. Replanted in spring. Many are rusting badly now.

TEOSINTE.—The result of one year's work by the Department of Agriculture of the Oklahoma Experiment Station with the forage crop "teosinte" shows a yield of 1580 pounds of forage to three-tenths of an acre; or 5260 pounds on the acre. The plant resembles corn in growth, does not mature seed in this latitude, and stools out from 40 to 60 stalks from one seed. Chemical analyses

are being made by the Department of Chemistry of the Station with a view to showing the feeding value of the fodder. This is one of the most promising introduced forage plants. Its luxuriant growth is very striking and its behavior in drought recommends it. Seed can be obtained of almost any reliable seedsman.

No. 8.—NOVEMBER, 1893.

COWPEAS.—Very gratifying reports of the cowpea test have been received from farmers all over the Territory. The crop has succeeded beyond what was expected. Reports show a yield of three and four tons of vines and from ten to thirty bushels of peas to the acre on sod, as well as on land one, two and three years from the sod. The most beneficial results will be the equal distribution of the seed throughout Oklahoma. It does not take farmers long to find out a good thing when they can try it on their own farms.

No. 9.—DECEMBER, 1893.

KAFFIR CORN is a non-saccharine sorghum and is cultivated for both forage and grain. The yield in green fodder is from three to six tons per acre. Taking an average yield of four tons per acre, each acre will produce 156.8 lbs. ash; 288.5 lbs. protein; 551.9 lbs. fiber; 1071.6 lbs. nitrogen free extract, and 69.9 lbs. fat. Assuming a coefficient of digestibility equal to that of corn, it can readily be seen that this is a very good forage crop. Prof. Holter, Station chemist, who furnishes us these figures, does not have sufficient data at hand to determine satisfactorily to what extent this crop exhausts the land. One good point in its favor is its succulence. Even when the stalks have become quite hard cattle will eat them with considerable relish.

No. 10.—DECEMBER, 1893.

VARIETIES OF WHEAT.—"Test of Varieties of Wheat" is the title of Bulletin No. 8 by the agriculturist of the Station. The following conclusions give in a condensed form the more important results of the test:

1. The varieties yielding the largest amount of grain to the acre are Silver Chaff Bearded, Michigan Amber (from Kansas), Missouri, and Currell, in the order named.

3. The ratio of grain to straw was least in Missouri, there being one pound of grain to every one and thirty-six hundredths pounds of straw.

4. Silver Chaff Bearded produced the most grain to the acre—24 bushels.

5. Mediterranean Red Chaff produced the most straw to the acre—3020 lbs.

6. None of the varieties were up to the standard in weight, the heaviest being German Amber and weighing 57.7 pounds to the bushel.

7. The varieties gaining weight per bushel over seed sown were: Earnhardt, Rural No. 5, and Michigan Wick. Highest gain, 1.3 pounds.

8. The early seeded plats gave the best returns except in case of Mennonite. This was planted more than a month later than plats one and fifty-two inclusive; but matured with them and yielded better returns than forty of the early seeded varieties.

9. The following varieties gave very satisfactory results for unmanured upland: Currell, Hybrid No. 9, Missouri, Dehl-Egyptian, Michigan Amber (from

Kansas), Silver Chaff Bearded, and Mennonite.

10. The late seeded varieties giving best returns are: Mennonite, Boyer, Extra Early Oakley, Tasmanian Red, in order named, ranging from sixteen to eighteen and three-tenths bushels to the acre.

11. Total number of inches of rainfall from first seeding to maturity of all the wheat was 19.86. Amount of rainfall reckoned necessary for a successful wheat crop is two inches a month if equally distributed.

WHEAT.—In Bulletin No. 8 of the Experiment Station on "Wheat" is given detailed descriptions of the six varieties out of two hundred and fifty-four which made the best returns. We give part of these descriptions below, as they will prove interesting to our farmers:

SILVER CHAFF BEARDED.—Planted Oct. 10th, '92, "in the dust." Seed came up well after first rain and gave a good stand of healthy looking plants; 216 days from planting to heading, and 247 days to maturity; harvested June 16th, '92; height of straw, two feet, two inches; heads bearded, broad, loose and flat; length of head, 2 1-8 inches; grain dark red, medium sized, shrunken. Yield of grain per acre, 24 bushels; yield of straw per acre, 2680 pounds. Ratio of grain to straw as 1 to 1.08.

MICHIGAN AMBER.—Planted Oct. 10, '92, "in the dust." Stand good; 215 days were required to time of heading, and 244 days to maturity; harvested June 17th, '93; height of straw, two feet, one inch; heads 2 3-4 inches long, smooth, loose, and tapering; grain dark red, short, shrunken. Yield of grain per acre, 24 bushels; yield of straw per acre, 2960 pounds. Ratio of grain to straw as 1 to 2.05.

TO PREVENT SMUT.—It was proved by experiments conducted on the Station farm last year that as much as five bushels of oats per acre were lost on account of smut. Experiments were also instituted to reduce the per cent. of smut, and to this end the Jensen or hot water method was used successfully. This consists in placing the seed oats in water at a temperature of 135 degrees Fahr. Be careful that the water does not vary either way more than two degrees at any time during the treatment. Put the seed in a sack or basket, and let it remain in the water not less than 13 nor longer than 15 minutes. As soon as the seed is removed from the bath, dip it in cold water to cool, then spread out to dry. The only things necessary are a good Fahrenheit thermometer, a bushel basket or sack, and a vessel for the hot water. This treatment involves some additional labor in seeding, but the increase in yield makes the method practicable. Many practical trials have shown that this treatment pays.

COWPEA HAY.—In the continuation of the experiment with cowpea hay in this country, it is found that the hay stored under shelter keeps bright and green, does not mould—if not wet when put up—and is eaten greedily by all kinds of stock. That stacked outside and capped with prairie grass is nearly as good as that housed, but suffers a greater percentage of loss from the outside by stock. Cattle, however, eat that from the outside of the stack almost as eagerly as the hay from the inside.

No. 11.—FEBRUARY. 1894.

CORN.—LISTED AND DRILLED.—In the test of corn listed vs. corn drilled, made by the Department of Agriculture, results show that for last season the listed corn was superior to the drilled; the yield of listed corn and stover being nearly double that of the drilled. It will be remembered that the season was extraordinarily dry. The rainfall from April to September was only 16.75 inches. For the first two or three months the drilled corn made the better appearance; but dry weather brought out the merits of the practice of listing.

CULTIVATION OF CORN.—Twenty-eight plats of listed and drilled corn were used in the test of frequency and depth of cultivation as made by the Experiment Station. The conclusions show that the largest yield of grain in listed corn was from plats cultivated shallow ten times, while the largest yield of grain in drilled corn was from plats cultivated shallow five times. The best yield of stover in drilled corn was from plats cultivated deep three times, while the largest yield of stover in listed corn was from plats cultivated five times.

SEED CORN.—An important experiment begun last year at the Experiment Station with corn, was to determine the best locality from which to secure seed for Oklahoma use. It was apparent from the results (which showed it in nearly every individual instance) that seed brought from the north produced here more grain and less stover than seed from the south; while the reverse is of course true, that southern grown seed produced more stover and less grain than northern grown seed. This experiment will receive close attention this coming season. It is intended to compare southern and northern grown seed with seed grown in Oklahoma. Oklahoma grown seed will be sent south and north to be grown and returned for trial on the Station farm. This is done in order that there may be no uncertainty as to variety. Results of this valuable piece of work will be watched with interest, not only by Oklahoma farmers, but by Station workers throughout the United States.

No. 14.—MAY, 1894.

GRASS.—The all important question of "Grass for Oklahoma" is not lost sight of in the work of this Department this season. I am testing, on a larger scale than heretofore, the four varieties of grasses and clovers which have proved best so far. These are: 1st, Bromis inermis—Awnless brome grass;—2nd, Alfalfa; 3rd, Cynodon dactylon—Bermuda grass;—4th, Lespedeza striata—Japan clover. Two of the above—Brome inermis and Alfalfa—have been secured from the north and west. The other two, Bermuda grass and Japan clover, are southern plants.

NOTE.—June 21.—Red clover was substituted for Japan clover. All are doing well.

BERMUDA GRASS.—Many people from the south of us, who have been raised up with Bermuda grass, condemn it on account of its staying qualities. They say that in a few years it will "take a place" and there is no successful farming with it. That is partly true in the more southern states, but experiments conducted at the Station show that late fall or winter plowing, exposing the roots during the winter, will kill it out. Bermuda is not an early grass. It

is but about an inch and a half or two inches high now on the Station farm, but drought seems to have little effect on it. It is green and crisp the entire summer through, and if not cut or pastured too late it is green next to the soil nearly all winter.

No. 15.—JUNE, 1894.

FORAGE CROPS.—The agricultural practicum of the Sophomore Class of the Agricultural and Mechanical College is directed entirely to solving the question of forage for Oklahoma. Cowpeas, red and white Kaffir corn, Teosinte, Soy beans and Maize are included in the work. The object is to determine what crop planted in what way will produce the most and best forage. The students are required to make the investigations, each for himself, guided by the professor in charge. The results of this work will be given to the public at the close of the season.

Department of Horticulture.

F. A. WAUGH, M. S., HORTICULTURIST.

No. 2.—MAY, 1893.

NURSERY STOCK.—The character and condition of nursery stock exerts a far greater influence upon the success of an orchard than is usually supposed. With several hundred apple trees bought from a number of widely separated nurserymen last year, this point was quite noticeable. From one order of stock 29 per cent. were lost entirely and had to be replaced this spring. From another the loss was only 10 per cent., being about one-third what it was from the other. The trees from which the 29 per cent. were lost came a long way and were subjected to a heavy freezing in the transfer from the railroad to Stillwater; and it should be said that adverse circumstances with the whole planting explain the large total loss. Trees from Texas lost 10 per cent. as noticed; trees from southeastern Missouri lost 14 per cent.; trees from Kansas City lost 22 per cent.; and trees from Georgia lost the 29 per cent. mentioned above.

No. 3.—JUNE, 1893.

SLOPE OF VINEYARD.—A good vineyard on a farm adds hundreds of dollars to the general value. The location of the vineyard, including the slope of the ground, plays an important part in the results. In the part of the Station vineyard sloping to the east the grape vines started perceptibly earlier than those on the west slope, and the late frosts did comparatively greater damage among them. Such points as these should all be considered in putting out orchards and vineyards.

EARLY PLANTING.—Do not Oklahoma farmers usually plant too early? This year such has certainly been the case with many crops in many instances. Garden vegetables have suffered most from this undue forcing. In the hurry for early vegetables they have been planted much earlier than the season would do them justice. This is our experience this spring on the Station grounds and has been the observation among the farmers. Cucumbers, squashes, musk melons and water melons planted the 15th of April failed entirely to make a stand, while those planted the latter part of the month and up to the 20th of May made a full stand. Peas sown on April 11th were ready for market at the same time as those planted just one week later and no sooner. Beans sown April 17th are only a trifle in advance of those sown May 25th and have not nearly so good a stand.

No. 4.—JULY, 1893.

GRAPE TRELLIS.—Grapes have done wonderfully well this year in Oklahoma. Already we have some enviable vineyards in bearing. Good trellises for the new vineyards should always be provided. The one just completed at the Experiment Station is a model in its way, and illustrates to those who see it the system of trellising and pruning so successfully used by T. V. Munson in Denison, Texas. The posts stand five feet, eight inches out of the ground. To the top is nailed a 1x6 cross piece two feet long. Along each end of the cross piece a wire is run so that there are two top wires to the trellis two feet apart. Eight inches below them another wire is run, it being fastened directly to the post. The theory of this system provides that one strong cane shall be brought up to the lower wire. The top is then pinched off and two side branches are run along the wire, one each way. When the bearing branches appear the next year they are carried sidewise out over the upper wires. This leaves the fruit hanging down within easy reach for spraying and picking, and at the same time keeps the fruit in the shade of the foliage. The bearing wood is renewed from the top of the upright cane by two side shoots brought out each year.

GRAPE DISEASES.—Grape growers need not expect any immunity from the diseases which growers elsewhere have to fight. We have found undoubted cases of black rot and anthracnose on grapes in the vicinity of Stillwater. The diseases have not appeared to any alarming extent, however. It means only that farmers must be prepared to meet them when their vineyards come into bearing. These diseases can all be successfully fought with spraying mixtures.

No. 6.—AUGUST, 1893.

JUNE BEETLES are the enemies of the sunflower. They may often be found working on the roots of the wild ones in the fields. Some times June beetles attack growing crops in numbers large enough to do considerable damage. A small patch of cultivated sunflowers on the grounds of the Experiment Station was attacked and almost ruined by them. The damage was done by entering the ground and eating the integument off the roots. In some cases large parts of the roots were eaten. With but few exceptions the death of the plant ensued. The June beetles also attack nursery stock in the same way; and are especially destructive with cottonwoods, willows, and the various kinds of pop-

lars. The trouble is that no one has a good way to suggest for fighting them. If they would confine their depredations to the sunflowers of the cornfields, we could give them more encouragement.

No. 6.—SEPTEMBER, 1893.

MUSK MELONS have been having a good season. Every man who really likes this delicious fruit has doubtless noticed that the small, spherical musk melons are superior to the large ones. All the best varieties in the experiments this year are of this general character. The best table variety is the Jenny Lind. The Early Nutmeg is second best. Banquet is a very pretty sort with golden yellow flesh, but the flavor is not so good as some others. Perfection is the best sort of larger size.

APPLE LEAF INSECTS.—Young pear and apple orchards have suffered a good deal in some places this fall and summer from the apple leaf crumpler (Mineola indiginella) and from the apple leaf webber and tyer. These insects have completely defoliated some trees. Such damage may be prevented by light spraying of Paris green or London purple. Spraying for all insects, and fungous diseases, ought to be almost as common as cultivating the orchard to keep out the weeds.

PLANT LICE.—The little green plant lice which fasten upon the leaves of cucumber and melon vines and suck the sap, can be killed with lime or weak kerosene emulsion. These insects are quite abundant this fall and have done a good deal of damage.

WATER MELON.—Jones' Jumbo is said to be one of the best varieties of water melons grown this year.

GRASSHOPPERS often do the young vineyards a considerable damage by girdling the new canes during the fall. Look at your vineyard and see if it is the case there.

No. 7.—OCTOBER, 1893.

WATER MELONS FOR SEED.—Water melons which have been affected with the rot—as a great number of melons have been this year—should not be considered in saving seed for next year. This rot of water melons has been quite general and very severe this summer and fall; and the disease is said to affect the seeds, so that melons raised next year from seeds of melons which had the disease this year, will be more likely to have the same trouble again. The Experiment Station has been studying this disease, and will continue experiments in treating it next year.

LATE BEANS.—Beans planted in the late summer make a very good crop. Some good results were obtained this summer with late beans. The two varieties which made the best showing were Early China Red Eye and White Prolific. They made a good crop planted in the early part of July. This would be late enough so that they might be grown after the early garden was all off.

No. 9.—DECEMBER, 1893.

GRAPE PRUNING may be attended to at any time from now till the buds start in the spring. The grapes at the Experiment Station get their pruning this month. The wood cut away may be made into cuttings and used for increas-

ing the stock next year. To do this, they should be cut into lengths of about three buds each, tied in bundles and stored in sand or buried butts up in a dry location till spring. Then they may be set in the open ground, and a good proportion may be expected to grow.

BORERS are so very common in the young orchards this fall that no man can afford to disregard them. In many cases these insects have already gained lodgment and must be cut out with the knife. But many of them may be killed and the hatching of fresh broods prevented by the use of a lye wash. An ordinary pound can of lye should be dissolved in a common pail of water, and this should be applied with a brush of old rags. It should be spread over the tree trunks, special attention being given to the forks of branches and to places where the bark is rough or broken, these being the places where borers oftenest hatch.

No. 11.—FEBRUARY, 1894.

JOHNSON GRASS has been found growing at large In Oklahoma. This grass has been collected and identified at Orlando and Marena. It was found in small quantities only at both places. Johnson grass is a terrible weed in some parts of Texas, and it may be forearming farmers to forewarn them that it has a start in Oklahoma. It is, however, quite possible that, under the influence of the different soil and climate it will not develop into such a pest as it is in Texas. We may hope that it won't.

No. 14.—MAY, 1894.

NATIVE GRASSES.—The abundance and variety of native grasses in Oklahoma gives some encouragement to those who hope to improve pastures and meadows by grass seeding. We can report the collection of fifty species last summer, though no effort was put forth to make extensive grass collections. Of these, several are well known for their value on the prairies, while many others are, of course, of no practical use.

OKLAHOMA TIMBER.—The natural timber of Oklahoma is known to be varied in its character and valuable in substance. No very complete survey has ever been made of what we actually have, all observations thus far having been scattering and unsystematic. In a list recently prepared we have enumerated, however, 73 species of trees, shrubs and woody timbers actually known to be native within Oklahoma and the Indian Territory. And that is not a bad showing for a preliminary survey. Of these there are many sorts of practical utility. There are, for instance, five species of grapes, four of plums, five species of oaks, and many other valuable trees.

SPRAYING MIXTURES are in demand by progressive horticulturists. The following directions for preparing them are the most useful and reliable formulas extant: For killing codling moths, curculios, gougers and insects which feed on the leaves of plants, spray with Paris green or London purple, using one pound of the poison to 250 or 300 gallons of water. For grape rot, anthracnose, mildew, apple scab, fruit rot, etc., spray with Bordeaux mixture. This is made by dissolving two pounds of blue vitriol in fifteen gallons of water; slacking two pounds of fresh lime in five gallons of water, and slowly mixing the two. Spraying with Bordeaux mixture should begin early in the season.

No. 15.—JUNE, 1894.

GRAPE TRAINING.—The training of grapes exerts an important influence on the fruit in some cases. The hot sun at this season of the year often dries and cracks the young fruit until it is almost worthless. It is plain, then, that if the grape vine is trained so as to provide shade for the fruit considerable advantage is gained.

BAGGING GRAPES.—For a few bunches of fine grapes for home use, it will pay to put on paper bags before the grapes ripen. To do this, use the ordinary paper sacks such as the grocerymen put up candy in. Slip one over a bunch and tie it lightly around the stem. This protects the fruit from birds, insects, diseases, hot sun and other dangers. It also causes the bunches to ripen more evenly and to remain on the vines in good condition much longer than when unprotected.

THE GINGKO TREE is one of the finest shade and ornamental trees that can be planted, though it is still so rare in this country that it cannot be used in large numbers. A few trees planted at the Experiment Station have lived and thrived exceedingly well under very trying circumstances. The tree is, so far as is known, entirely free from insects and fungous enemies.

Department of Chemistry.

GEO. L. HOLTER, B. S., CHEMIST.

No. 3.—JUNE, 1893.

MANURE VALUE OF DIFFERENT CROPS.—A very important question to which the farmers of Oklahoma should have their attention called, is the value of farm products as manure. It is a well known fact that the soil of the Territory is not deep. This is particularly true of the higher lands, and even in the rich creek and river bottoms it is the exception rather than the rule that a great depth of soil is to be found.

Should our farmers continue to raise crops year after year without paying any attention to fertilization, it will be a few years only until this exhaustion will be plainly seen. The sooner we recognize this necessity of fertillzation the better. It is not a question for the upland farmers alone, but for their neighbors on the bottom lands as well.

The three fertilizing ingredients of most importance are nitrogen, potash and phosphoric acid. Nitrogen is worth, we will say, eighteen cents per pound; potash five cents, and phosphoric acid eight cents. In one ton of wheat straw there are 11 pounds nitrogen, 12 pounds potash and 4½ pounds phosphoric acid. At the above valuation these are worth as manure $2.94.

In one ton of corn stalks there are 17 pounds nitrogen, 18 pounds potash and 10 pounds phosphoric acid, worth as a manure $4.76.

Too frequently the straw and stalks are burned or disposed of in some other manner and not utilized as a manure. These products usually remain on the farm.

Let us consider a few products that are sold. When the farmer has disposed of 35 bushels of wheat at 75 cents per bushel, he has in hand $26.25. If we care not for the value of our land and the necessity of maintaining fertility, the above statement is correct; but let us go a little further. In disposing of 25 bushels of wheat the farmer has taken from his soil 36 pounds nitrogen, 16 lbs. potash and 10 lbs. phosphoric acid, and has taken from the land $8.08 worth of fertilizing ingredients. If he sells the same number of bushels of corn, he has taken from his land 30 pounds nitrogen, 7 pounds potash and 10 pounds phosphoric acid, containing $6.55 worth of fertilizing ingredients. Should he sell 72 bushels of oats, he has taken from his land 37 pounds nitrogen, 8 pounds potash and 13 pounds phosphoric acid, which, in manurial value, is worth $8.10. What has been said of wheat, corn and oats may be said of everything that is raised on a farm.

While it is not advisable to use wheat, corn and oats for fertilizing purposes, it should not be forgotten that the ingredients they draw from the soil should be returned if we would maintain the fertility. The wisest thing for our farmers to do is to begin right now, and carefully and intelligently consider the question of how to best retain the present fertility of their soil.

Work all the straw you possibly can through your stables, and when this is done do not be afraid to haul manure. Do not have your stables located on the bank of a creek in such a way that every time it rains the water from your barn-yard will drain into said creek, for in this way the water soluble portion of the manure is carried off and nothing remains but fibrous matter, which, as a fertilizer, is of little value.

No. 4.—July, 1893.

DRINKING WATER.—Bulletin No. 7 of the Experiment Station treats of water analyses. While the samples analyzed are somewhat local, the results indicate that good water can be obtained. There were a few samples of bad water, but the pollution was generally traced to a local cause. In several instances the wells were too near barn-yards and not sufficiently well protected from drainage. In one particular instance the water from the barn-yard drained directly into the well. The analysis showed the well to contain water absolutely unfit for any use except as liquid manure. It too frequently happens that people are satisfied with salt water, when, by digging a new well, good water can be obtained. Considerable common salt is found in the water of the Territory, and in certain localities no inconsiderable amount of sodium and calcium sulphate is found. Aside from the presence of these undesirable elements, good water exists. Wells and springs should be carefully cleaned and kept free as possible from pollution.

No. 7.—October, 1893.

DRINKING WATER.—Oklahoma water has always been a subject of

question by those who were skeptical as to the advantages of the Territory. Does Oklahoma have good drinking water? This is the question which the Oklahoma Experiment Station has been endeavoring to answer. The results to date are set forth in Bulletin No. 7. In the introduction the bulletin says:

To a person who has always lived in a mountainous country, where good spring water is easily obtained, the well and spring water of this country would not be judged good. If by good water we understand it to be cool, clear and sparkling, then the question must be answered in the negative. In giving this reply I do not wish to be understood as saying that there is no such water in the Territory. Such a statement I am not prepared to make, since the samples for this bulletin have nearly all been taken in Payne county. I have sampled some water that was fairly cool and yet was not so cool as mountain water. But the question of temperature should not be too prominently considered, since cold water, which at the same time may be clear and sparkling, quite often is found to be very impure. No effort has been made to get the best samples. Neither have I tried to get the poorest, the samples being drawn from different parts of the county and represent, in my judgment, fairly the conditions as they are. It is shown by the analyses that the water is generally good from a sanitary point, and where a poor sample was found the source of the impurity was not hard to locate.

No. 9.—December, 1893.

COARSE FODDER CROPS.—In Oklahoma, prairie grass is not by any means a certain crop and up to the present time nothing definite has been determined as to the adaptibility of tame grasses to his dry and hot climate. Each year as the various farms are being improved the supply of prairie grass is constantly growing less, and this in spite of an ever increasing demand for hay. Now would it not be wise for us to pay more attention to some of the coarser fodders? No one will have the temerity to say that Oklahoma is not a corn producing country, and since it is a fact that large crops of corn are grown each year, we have in this product, when properly cared for, an excellent substitute for some of the grasses which we do not have. Each acre will produce from one to two tons of fodder (2240 pounds per ton), and each ton of this fodder, at a minimum valuation, will contain 1057.5 pounds water, 45.7 pounds ash. 61.0 pounds protein, 584.7 pounds nitrogen free extract, 482.1 pounds fiber, and 19.0 pounds fat. Of the above food elements there is digestible 68 pounds ash; 15.3 pounds protein; 433.6 pounds nitrogen free extract; 361.5 pounds fiber, and 15.2 pounds fat. Granting the above figures to be correct, is it economy on the part of Oklahoma farmers to ignore corn fodder as a food product? Of course good results cannot be obtained if the fodder is not properly cured and carefully prepared for feeding. Each farm should have a cutter and crusher and instead of throwing the prepared feed on the ground, mangers or troughs should be provided. It is not claimed that corn fodder will make cattle take on any considerable amount of fat, but when carefully fed it will carry them through the winter and bring them out in the spring in a fairly good condition. The point may be raised that this extra preparation of food will entail too much labor, but when we consider the benefit to be derived from such a course in the way of better conditioned stock and the accumulation of a large amount of manure, I think you will be well repaid for the labor expended, especially as this work is

done at a season of the year when there is not much else being done on the farm. The individual corn crops not being large, there is no reason why the entire crop should not be cut and the corn and fodder carefully put away before winter. The practice of leaving corn stand in the field until spring is a decidedly careless one and should be discontinued.

SOILING CORN.—Set aside from two to four acres of ground for this purpose and during the winter manure quite heavily. After plowing in the spring the ground should be harrowed, rolled and seeded, the seed being sown in drills about three feet apart and put on at the rate of four bushels to the acre. The crop should be cultivated frequently. When several acres are to be seeded, the entire crop should not be put out at one time, as it is not desirable to have it all mature at once. A week or ten days between each planting will answer the purpose very well, all depending of course upon your ability to use the several crops as they mature. You can begin to use when the corn is about four feet high. Soiling corn generally has a high coefficient of digestibility. With farmers engaged in the dairy business—and there are a great many in the Territory—the question of an early forage crop should receive careful consideration. By its use the early summer pastures may be protected and a great deal more hay stored for the ensuing winter.

BULLETIN NO. 11.—FREE.
OKLAHOMA EXPERIMENT STATION,
STILLWATER, : : OKLAHOMA.

Director.