

1) COLORADO

THE STATE AGRICULTURAL COLLEGE.

2)
THE AGRICULTURAL EXPERIMENT STATION.

3) _____
BULLETIN NO. 30.



I—FARM NOTES FOR 1894.

Home Station, Fort Collins, Colorado.

II—NOTES ON TOMATOES.

Home Station, Fort Collins, Colorado.

Approved by the Station Council,

ALSTON ELLIS, President.

FORT COLLINS, COLORADO,

FEBRUARY, 1895.

Bulletins will be sent to all residents of Colorado, interested in any branch of Agriculture, free of charge. Non-residents, upon application, can secure copies not needed for distribution within the State. The editors of newspapers to whom the Station publications are sent are respectfully requested to make mention of the same in their columns. Address all communications to the

**DIRECTOR OF THE EXPERIMENT STATION,
FORT COLLINS, COLORADO.**

Agricultural Experiment Station,

FORT COLLINS, COLORADO.

THE STATE BOARD OF AGRICULTURE.

| | Term Expires. |
|---|------------------------|
| HON. JOHN J. RYAN | Fort Collins,.....1897 |
| HON. A. L. EMIGH | Fort Collins,.....1897 |
| HON. J. E. DuBOIS | Fort Collins,.....1899 |
| HON. JOSEPH S. McCLELLAND | Fort Collins1899 |
| HON. JAMES L. CHATFIELD | Gypsum.....1901 |
| HON. A. LINDSLEY KELLOGG..... | Rocky Ford,1901 |
| HON. ALVA ADAMS..... | Pueblo,.....1903 |
| MRS. JOHN L. ROUTT..... | Denver,.....1903 |
| GOVERNOR ALBERT W. McINTIRE, } PRESIDENT ALSTON ELLIS..... } | EX-OFFICIO. |

EXECUTIVE COMMITTEE IN CHARGE.

HON. J. S. McCLELLAND, HON. JOHN J. RYAN,
HON. A. L. KELLOGG,
THE PRESIDENT OF THE BOARD AND THE PRESIDENT OF THE COLLEGE.

STATION COUNCIL.

ALSTON ELLIS, A. M., PH. D., LL.D.,..... PRESIDENT AND DIRECTOR
WELLS W. COOKE, B. S., A. M.,..... AGRICULTURIST
C. S. CRANDALL, M. S.,..... HORTICULTURIST AND BOTANIST
WILLIAM P. HEADDEN, A. M., PH. D.,..... CHEMIST
L. G. CARPENTER, M. S.,.... METEOROLOGIST AND IRRIGATION ENGINEER
C. P. GILLETTE, M. S.,..... ENTOMOLOGIST
DANIEL W. WORKING, B. S.,..... SECRETARY
LATHROP M. TAYLOR, B. S.,..... STENOGRAPHER

ASSISTANTS.

FRANK L. WATROUS,..... AGRICULTURIST
M. J. HUFFINGTON,..... HORTICULTURIST
CHARLES J. RYAN,..... CHEMIST
CHARLES F. BAKER, B. S.,..... ENTOMOLOGIST
R. E. TRIMBLE B. S.,..... METEOROLOGIST AND IRRIGATION ENGINEER

SUB-STATIONS.

F. A. HUNTLEY, B. S. A., SUPERINTENDENT,
Arkansas Valley Station, Rocky Ford, Colorado.
J. H. McCLELLAND, SUPERINTENDENT,
Divide Station, Monument, Colorado.
CHAS. A. DUNCAN, B. S., SUPERINTENDENT,
San Luis Valley Station, Monte Vista, Colorado.
J. B. ROBERTSON, SUPERINTENDENT,
Rain-Belt Station, Cheyenne Wells, Colorado.

Farm Notes For 1894.

BY W. W. COOKE AND F. L. WATROUS.

WHEAT.

Several varieties of wheat were sown in small plats on April 2d. They were irrigated May 23d and June 20th, and harvested August 11th.

The Polish wheat was sown March 15th, irrigated May 15th and June 22d, and harvested August 8th.

Polish wheat is more commonly known in this State under the name of Mammoth Spring Rye, but the latter name is misleading. It is a true wheat, but of a different species from ordinary wheat. The Polish wheat was grown this year, under bad conditions of land and water and the yield of twenty-five bushels to the acre was much more than ordinary wheat would have been under the same conditions. It is a very hard wheat and when fed whole to our sheep was largely passed undigested. It does not make good flour but, when cracked, is an excellent stock food.

| Variety. | Area of Plat in Acres. | Yield per Plat in Bushels. | Yield per Acre in Bushels. |
|-----------------------------|---------------------------|-------------------------------|-------------------------------|
| Saskatchewan Fife..... | 0.25 | 6. | 24 |
| Velvet Chaff Blue Stem..... | 0.25 | 5. | 20 |
| Marvel..... | 0.25 | 4.5 | 18 |
| Belotourka..... | 0.0067 | 0.11 | 17 |
| Dur de Medeah..... | 0.0067 | 0.13 | 20 |
| Polish..... | 12.00 | 304. | 25 |

OATS.

Last season was especially favorable for oats. Copious rains came at just the right time to make the heads fill well and the oat crop of the Poudre Valley has never before been equalled. Nearly all the kinds raised on the farm did well and most of them very well. The three-acre plot of Silesian

oats was a red clover sod plowed in the fall after being irrigated, but nevertheless it was so dry in the spring that after being sown April 6th it had to be irrigated May 17th to make the seed germinate. When it did come, it made an almost perfect stand.

All the other varieties were sown on unfertilized land that had been cropped with grain the previous year. The oats were sown March 30th, irrigated May 25th and June 20th, and harvested August 11th.

| Variety. | Area of Plat in Acres. | Yield per Plat in Bushels. | Yield per Acre in Bushels. |
|-----------------------------|---------------------------|-------------------------------|-------------------------------|
| Calgary Gray..... | 0.10 | 6.5 | 65 |
| White Scotch..... | 0.33 | 12. | 36 |
| Badger Queen..... | 0.10 | 5. | 50 |
| White Russian..... | 0.25 | 15. | 60 |
| Yellow French..... | 0.25 | 16. | 64 |
| Negro Wonder..... | 0.33 | 18. | 54 |
| American Banner..... | 0.33 | 22. | 66 |
| Red Rust Proof..... | 0.33 | 16. | 48 |
| Race Horse..... | 0.20 | 10. | 50 |
| Great Northern..... | 0.33 | 20. | 60 |
| White Bonanza..... | 0.40 | 16. | 40 |
| Lincoln..... | 0.40 | 16. | 40 |
| Irish..... | 0.40 | 16. | 40 |
| Silesian and Excelsior..... | 1.00 | 48. | 48 |
| Excelsior..... | 4.00 | 24.1 | 60 |
| Silesian..... | 3.00 | 22.5 | 75 |
| Totals and Averages..... | 11.75 | 70.2 | 59.75 |

BARLEY.

While Colorado is not particularly adapted to barley and comparatively little of it is raised, yet the fine crops that are sometimes grown show what may be done with good conditions and good seed.

Barley grows in Colorado with a very short straw, but the heads and the grain compare well with the growths of any country. All the varieties grown the past season were in small test plats. They were sown April 2d and May 12th; the first sowing irrigated May 23d and June 16th, and the last irrigated June 25th, and harvested August 1st to 12th.

The Nepaul and Black barleys are hullless i. e., in threshing, they separate from the hull like wheat. The rest of the kinds retain the hulls in threshing. The California barley deserves special notice for its drouth resisting qualities and its productiveness. It is the only cereal that withstood the severe drouth of last season at the Cheyenne Wells sub-station and the yield of fifty bushels to the acre that we obtained here was re-cleaned, fine seed weighing fifty-six pounds to

the bushel. The California barley was sown May 12th, irrigated June 25th, and harvested August 12th.

| Variety. | Area of Plat in Acres. | Yield per Plat in Bushels | Yield per Acre in Bushels. |
|---------------------|---------------------------|------------------------------|-------------------------------|
| Champion..... | 0.17 | 8.5 | 51 |
| Nepaul..... | 0.17 | 8.5 | 27 |
| Black..... | 0.17 | 4.0 | 24 |
| Manshury..... | 0.33 | 11.5 | 34 |
| New Zealand..... | 0.014 | 0.75 | 51 |
| California..... | 0.50 | 25.0 | 50 |
| Italie..... | 0.0067 | 0.15 | 23 |
| Celeste Petite..... | 0.0067 | 0.17 | 23 |

RYE.

A sixth of an acre of Prolific Spring Rye yielded four bushels, or twenty-four bushels per acre. It was sown, irrigated and harvested at the same times named in connection with the wheat.

BUCKWHEAT.

The farmers of Colorado seem to raise but very little buckwheat, and apparently the reason is not that buckwheat will not grow, but that it shells and wastes so in harvesting.

The small plats raised on the farm this season were cut by hand with great care, carried in a canvas to avoid loss and threshed by hand, and yet it is probable that the amount saved represented not much more than two-thirds of the seed grown by the plants.

Two distinct kinds of buckwheat were grown. The Asiatic and the Angled are like the ordinary Silver-hull or Japanese buckwheat. While the other two varieties have a smaller berry shaped more like a kernel of wheat or rye from which it gets its name of rye-buckwheat. This kind is new to Colorado but has been long raised in New England under the name of India wheat or Nigger wheat. Its special characteristic is that it will grow on soil too poor to raise anything else. All varieties made a rank, vigorous growth, but owing to the losses in harvesting it is doubtful whether any of them would prove profitable on land rich enough to grow other grains.

Some second sowing, made in the middle of summer, proved a complete failure. The varieties reported on below

were sown in drills May 25th, irrigated June 28th, and harvested August 20th.

| Variety. | Area of Plat in Acres. | Yield per Plat in Bushels. | Yield per Acre in Bushels. |
|--------------------|---------------------------|-------------------------------|-------------------------------|
| Tartarian | 0.0067 | 0.17 | 26 |
| Rye-Buckwheat..... | 0.0067 | 0.18 | 28 |
| Aangled..... | 0.0067 | 0.16 | 24 |
| Asiatic..... | 0.0222 | 0.16 | 7 |

MILLET.

Millet was grown as an early crop for seed and as a late crop for hay. In both cases it did not make a satisfactory growth. Although an abundance of good seed was used on land in good condition and that raised large crops of other grains on neighboring plats, yet the stand of the millet was poor and the growth not vigorous.

The millets grown were of two classes, those with the solid, round head, represented by the Hungarian and California and those with the loose head comprising the remainder of the varieties. These latter varieties are called "broom corn millets" from the resemblance of the head to broom corn and the four varieties grown are apparently the same millet, modified slightly by different conditions of soil and climate.

| Variety. | Area of Plat in Acres. | Yield per Plat in Pounds. | Yield per Acre in Pounds. |
|------------------|---------------------------|------------------------------|------------------------------|
| Hungarian..... | 0.033 | 15 | 450 |
| California..... | 0.055 | 11 | 220 |
| Manitoba..... | 0.055 | 30 | 549 |
| Russian..... | 0.007 | 5 | 755 |
| Hog Millet | 0.180 | 124 | 704 |
| Red French..... | 0.100 | 74 | 740 |

BEETS.

Both stock and sugar beets were grown both with and without irrigation. What is called in the table "west field" is a piece of low land that is coming into alkali from a ditch on the upper side. It was raw sod broken in the spring of 1893 and re-plowed six inches deep in the spring of 1894. It was so filled with alkali that scarcely anything would grow on it and yet, under these very bad conditions, we obtained a crop of about thirteen tons per acre of beets.

The "east field" is a piece of land that used to be a cat-

tail swamp but has been reclaimed by tile draining.

The beets were planted with an ordinary Buckeye grain drill, two out of each three holes being stopped up, making the rows twenty-four inches apart. They were sown in the west field May 21st, cultivated June 9th, 27th, and July 2d, and thinned July 14th. Those in the east field were sown May 12th, cultivated June 6th, 18th, and 27th, thinned July 3d, and irrigated August 2d. The west field was not irrigated. All the kinds were stored in the root cellar and have kept remarkably well. They are being fed to steers, sheep, hogs, cows, and horses with satisfactory results, especially in the case of the hogs.

| Variety. | Area of Plat in Acres. | Yield per Plat in Pounds. | Yield per Acre in Tons. |
|-------------------------------|---------------------------|------------------------------|----------------------------|
| WEST FIELD: | | | |
| Yellow Globe Mangel | 0.80 | 19879 | 12.4 |
| Red Mangel..... | 0.60 | 19413 | 16.2 |
| Mette Sugar..... | 0.48 | 9069 | 9.4 |
| EAST FIELD: | | | |
| Mette Sugar | 1.33 | 33372 | 12.7 |
| Lane's Sugar..... | 0.58 | 21663 | 18.8 |
| No. 4 Sugar..... | 0.17 | 4360 | 12.6 |
| Total and Average..... | 3.96 | 108116 | 13.6 |

POTATOES.

The principal work done with potatoes was the testing of the effect of commercial fertilizers on their growth and the results are printed in full, not because they show any large advantage to have come from the use of the fertilizer but because they show in a striking manner what may be expected from such work under irrigation. The fertilizers used were "tankage" and "bone meal," both made by the Armour Packing Company, Kansas City, Missouri. They both consist of the refuse from slaughter and rendering houses, dried and ground, but not dissolved with acid, so that the fertilizing elements exist in a form not soluble in water. The tankage is the richer in nitrogen, the bone meal in phosphoric acid. Neither contains but a small amount of potash. They constitute the only forms of commercial fertilizers that are now for sale in Colorado markets.

The fertilizer was sown in the drill at the rate of 400 pounds per acre and intermediate plats left without fertiliza-

tion. The arrangement of plats and yields are given in the following lists:

| Variety. | Fertilizer. | Yield of larger Potatoes per Plat in lbs. | Yield of small Potatoes per Plat in lbs. |
|--|-------------|---|--|
| Early Ohio..... | None | 16 | 22 |
| “ “..... | Tankage | 28 | 16 |
| “ “..... | Bone Meal | 22 | 26 |
| “ “..... | None | 16 | 17 |
| “ “..... | Tankage | 9 | 10 |
| “ “..... | Bone Meal | 18 | 13 |
| “ “..... | None | 13 | 14 |
| Rose Seedling..... | None | 30 | 38 |
| “ “..... | Tankage | 39 | 41 |
| “ “..... | Bone Meal | 26 | 30 |
| “ “..... | None | 24 | 28 |
| “ “..... | Tankage | 30 | 39 |
| “ “..... | Bone Meal | 28 | 33 |
| “ “..... | None | 38 | 45 |
| Average of all Plats..... | | 24 | 26 |
| Average of Plats with no Fertilizer..... | | 23 | 27 |
| Average of Plats with Tankage..... | | 26 | 26 |
| Average of Plats with Bone Meal..... | | 23 | 25 |

The point that shows most clearly is the great difference between neighboring and similarly treated plats. This can always be expected in irrigated ground. The yield depends very largely on the moisture of the ground and even under the best of irrigation this is much more irregular than where water is supplied by rain.

The second point is that the differences between plats similarly treated are greater than between the average of plats differently treated. This shows the necessity in work of this kind of having duplicate plats.

The fertilizer has on the average, increased the yield but it has not had the large and decided effect that is produced by a soluble fertilizer used in a country where the soil is moist in early summer. Both bone meal and tankage require moisture to allow the acids of the soil to act on them and make them soluble and under Colorado conditions, where there is but little rain and no irrigation water is applied until the middle of summer it is not surprising that they do not prove successful.

NON-SACCHARINE SORGHUMS.

In the eastern part of Colorado and the western portions of Nebraska and Kansas, the non-saccharine sorghums, such as Kaffir Corn, Jerusalem Corn, Milo Maize, etc., have come to be largely grown because they require so little water to

make a reasonable crop.

A test was made at the College farm to see whether they would yield enough more under irrigation to prove a profitable crop.

Several varieties were sown May 17th in drills thirty-six inches apart on seepage ground near a ditch where they had an abundance of water all the season. They were cultivated and hand hoed. On August 18th, notes were taken of their stage of growth as follows:

Yellow Milo Maize. Three feet high, leafy, stocky, most advanced stems, just heading at four feet.

White Milo Maize. Much the same. Not quite so full of heads.

Evergreen Broom Corn Five to eight feet high; good stand and heavy yield; heads just beginning to show blossoms.

Japan Broom Corn. Same as the Evergreen but more leafy and not so far advanced.

African Millet. Two and a half to three feet high, very few heads, rather uneven, but pretty good stand.

Jerusalem Corn. Three and a half feet high, a few heads, the most advanced turning down, not yet in blossom.

Red Kaffir Corn. Fairly heavy growth, three to three and a half feet high, no heads showing even in the stalk.

White Kaffir Corn. About like the last.

The sorghums were harvested at various times from September 16th to 27th. They were put in the silo, heads and stalks. Each of them, even the broom corn, made excellent ensilage.

Yellow Milo Maize. This made the heaviest growth, ripened earliest, and produced the most seed of all varieties, though none of the plats had what would be considered a good yield of grain. The whole plant weighed 19.3 tons per acre, containing 30 per cent. of dry matter or 5.8 tons of dry matter per acre. This 19.3 tons was divided into fifteen tons of stalks and 4.3 tons of heads. The heads contained thirty-four per cent. of dry matter or 1.46 tons of dry matter per acre, and yielded twenty-seven bushels of seed per acre.

African Millet. This seems to be practically the same thing as the White Milo Maize. It produced at the rate of 18.4 tons per acre, divided into 2.7 tons of heads and 15.7 tons of stalks and leaves.

Red Kaffir Corn. Only a few heads, just going out of blossom; stalks short, averaging scarcely three feet high, heads quite large but few. Whole crop, seventeen tons per acre.

White Milo Maize. This gave a total crop at the rate

of eighteen tons to the acre, containing 29 per cent. of dry matter, or 5.2 tons of dry matter per acre.

Egyptian Corn. The poorest stand of all, with a few scattering but large heads. The whole crop yielded at the rate of eleven tons to the acre, containing 37.5 per cent. of dry matter, or 4.1 tons of dry matter per acre.

The two Broom Corns did not ripen the brush very well, but they grew an enormous amount of fodder per acre. If this had been dried and fed to stock, it would have been poorly eaten, but being preserved wet in the silo it was eaten readily. The Evergreen Broom Corn yielded twenty tons of fodder per acre, and the Japanese twenty-two tons per acre. They averaged 38.5 per cent. of dry matter, or over seven tons of dry matter per acre.

Such material, with 32 to 38 per cent. of dry matter, is as dry as it is safe to put in the silo.

FORAGE PLANTS.

During the season of 1894, nearly seventy-five varieties of forage crops were grown in large and small plats on the College farm. Many of them need continued tests to furnish a basis for an intelligent judgment.

Flat Pea. (*Lathyrus sylvestris*). A great many letters have come to the Station asking about this new forage plant. It has not been tried sufficiently yet to show whether it will ever return a profitable crop, but it is certain that it never will be largely grown in Colorado. It needs to be planted in well prepared soil, carefully hand weeded and cultivated a whole season, and then transplanted the next season to its permanent place. The crop the second year is not enough to pay expenses. So that it is not until the third year, after an investment of as much money as several years' crops will be worth, and the loss of the use of the land for two years, that the crop begins to make any return. There has nothing yet come to light in its history at this Station or at any other to indicate that when fully set and grown, it is even as good as alfalfa.

We have a considerable quantity of it sown at the College, but it has not made so large a root growth as it should under the favorable conditions surrounding it.

Sacaline. (*Polygonum sachalinense*). This plant is getting an immense amount of advertising at the present time

and many inquiries have come to the Station concerning it.

Roots and seed were imported from France by this Station during 1894, and were tried under various conditions. The seed failed entirely to grow, though tried in field culture, garden plats, and by greenhouse methods. Some roots started in the greenhouse during the latter part of winter, were well grown when set out in rich ground the first week in May. They were near a hydrant, where they could be watered abundantly and seemed in vigor all the summer. But the amount of growth was disappointing. The most vigorous plant did not grow two feet tall. For a few days during the hottest part of the summer, the plants seemed to make a vigorous growth, but with the first chilly nights the growth ceased. They blossomed but ripened no seed. The climate is apparently not warm enough for the plant to make a profitable growth.

Rape. For many years rape has been grown in France and Germany for the oil contained in its seeds, and in England as a forage crop. Within the past five years, it has been introduced into Canada, and a few experimental patches have been grown in the United States. The most flattering accounts of it from either England or Canada, do not credit it with a vigor of growth equal to that it displayed on the College Farm the past season. An excellent crop in Canada is considered to be from nine to thirteen tons per acre. Of all the plats grown on the farm none yielded so low as the higher of these numbers. It was sown at different times and by different methods, and several varieties, and the smallest yield of all was twenty-two tons to the acre. One plat doubled this and a spot of special luxuriance gave a yield of fifteen pounds from four square feet or at the rate of seventy-five tons per acre.

There would seem to be no question about the plant's being adapted to Colorado soil and climate, the points now to be worked up are the best methods of planting, harvesting, and feeding. On these the Station is planning to do considerable work, the present season.

For the benefit of those not familiar with the plant, we may say that it looks and grows like a rutabaga turnip with an extra large top and a small tough root. The top is the part eaten. It is sown in drills or broadcast, any time from April 20th to August 5th. The seed is very cheap, costing less than twenty-five cents to seed an acre. The plant is ready to pasture or to harvest at sixty days from planting. Two crops can be grown on the same ground the same season. It takes a hard freeze to injure it. It cannot be dried for hay, but is pastured or cut for a soiling crop or for ensilage. It is

just about as watery as sugar beets and much the same composition as alfalfa. It will bloat an animal if given in too large quantities the first day. By feeding some dry fodder in connection with the rape, it is easy to prevent the bloating, and after the first few days all danger is past. The rape grew well for us last summer on ground so alkaline that even sugar beets could not succeed.

Its best use at present seems to be for sheep pasture in summer and early fall. If ensilage ever is adopted in Colorado this plant will rival corn as an ensilage crop.

CORN.

During the season of 1894, many varieties of corn were raised on the farm. The particular object in view was the comparison of the large southern corns, with the smaller varieties in common use. This was the first time that large fodder corn had been raised on the College Farm and almost the first ever seen in this vicinity. All the varieties were planted the same day, May 15th, with a hand planter, in hills three feet apart each way, allowing about five kernels to the hill. They were harrowed June 4th, and during the next three weeks were cultivated three times both ways, and the weeds in the hills cut out with hoes. They were irrigated July 2nd, and afterwards cultivated again both ways. Half of each variety was on land freshly manured with stable manure, the other half on fairly good land, the second year from red clover sod. Both fields turned out to be very uneven in character and drainage, so much so that it was deemed best in making comparisons to select one hundred hills of each variety, taken half from the manured and half from the other piece and selected to give as nearly as possible a correct comparison of the different varieties. The yields given in the following tables are calculated from these hundred hills, and represent what any farmer can fairly expect to obtain on medium land, well cultivated and irrigated. These yields are on the average a little less than the crops we obtained the same season from our fields that were planted entirely to large fodder corn, i. e., the land selected for the variety test was not quite so good as the average of our tillable soil.

The varieties were harvested September 25th, after several moderate frosts. Notes were taken on the growth from time to time.

Each variety will be described by itself, and then the large and small varieties compared.

Samples of each variety were taken at the time of harvesting to determine the amount of water and dry matter in the crop. The ears were spread out to dry in the corn house for three months and then shelled and weighed.

Both flint and dent varieties were raised, and both small and large kinds of each. The flint corn varied from the little Wills' Gehu Seventy-Day Corn with some ripe ears at three feet high, to the Giant Long White Flint that at eight feet high had not even by harvest time grown an ear fit to roast. Equal differences existed in the dent corns, the earliest and smallest being represented by the Wisconsin Yellow Dent, while the Brazilian Flour Corn represents the other extreme of no ears at all when killed by frost.

SMALL FLINT CORN.

Golden Dew Drop. This is one of the smaller flint corns, showing the first tassels August 1st, and the first roasting ear, August 25th.

On August 18th it was low and leafy, four to five feet high, small stalks, not well eared, ears just showing cob.

September 25th it was scarcely ripe. Total crop, 8.4 tons per acre, containing 31.57 per cent. of dry matter, or 2.65 tons of dry matter per acre. The green ears weighed 4,820 pounds, dried down to 2,772 pounds of ear corn, and 34.4 bushels of shelled corn per acre.

Wills' 70-Day Gehu. This is smallest and earliest of all the varieties grown. First tassels appeared July 22d, and by August 14th, some of the ears were ready to roast. On August 18th, only five feet high, very many suckers, heavily eared, some ears being within six inches of the ground; extra good stand, no replanting, very irregular in ripening; most advanced ears already glazing; many ears only showing cob, most of the ears in full milk. Average per hill, thirteen stalks, six tassels and six ears.

September 16th; ripe and dry. Total crop, 7.1 tons per acre, containing 32.76 per cent. dry matter, or 2.33 tons of dry matter per acre. The ears at harvesting weighed 4,900 pounds, dried down to 2,694 pounds of ear corn, and 37.8 bushels of shelled corn per acre.

King Philip. A red flint corn very early for its size

showing tassel July 29th. On August 18th, extra good growth, eight to nine feet high, well eared, very small stalks, almost half the ears at the boiling stage, and a few beginning to glaze. The average hill contained ten stalks, five tassels, and four ears. The ears did not set well, nor fill out, and the yield of shelled corn was much less than would have been expected from its condition in August.

September 16th; ripe and dry. Total crop 9.6 tons per acre, containing 25.06 per cent. of dry matter, or 2.41 tons of dry matter per acre. The ears at harvesting weighed 3,600 pounds per acre, and dried down to 1,639 pounds ear corn, and 18.9 bushels shelled corn per acre.

Sanford. A white flint, with very long ears, medium early. Is almost sweet and makes a nice table corn. It showed the first tassel August 3d; August 18th, very leafy, seven to nine feet high, considerable replanting, only medium earing, small stalks heavily suckered. The average hill contained nine stalks, five tassels, and three ears.

September 25th, well ripened but poorly eared and badly eaten by worms. Total crop, 11.7 tons per acre, containing 32.07 per cent. dry matter, or 3.75 tons of dry matter per acre. The green ears weighed 5,302 pounds per acre, and dried down to 2,651 pounds ear corn, and 32.3 bushels shelled corn per acre.

Longfellow. A medium yellow flint corn, that is much grown in some parts of the country. First tassel August 1st, and first roasting ear August 28th. On August 18th, fully tasseled at six to seven feet. Ears low, some only one foot from the ground; well eared, ears showing cob. The average hill contained ten stalks, five tassels, and three and one-half ears, thus being heavily suckered.

September 25th; ears well ripened, but not well filled; rather poor as a whole, but some nice ears. Total crop, 9.8 tons per acre, containing 31.03 per cent. of dry matter, or 3.04 tons of dry matter per acre. The ears at harvesting weighed 3,856 pounds per acre, which dried down to 1,928 pounds of ear corn, and 23.7 bushels of shelled corn per acre.

Minnesota King. This can be classed as either a flint or a dent corn, as part of the kernels are dented and others are typical flint shape. On August 18th, poor stand with some replanting, irregular, tasseled at six to eight feet high; the first tassels having appeared July 29th. Well eared, ears long, almost to roasting stage, only a few suckers. The average hill contained three stalks, three tassels, and two ears.

September 25th. Ears fully ripe and all the kernels

apparently true flint. Total crop, 7.1 tons per acre, containing 28.30 per cent. of dry matter, or 2.01 tons of dry matter per acre. The green ears weighed 2,892 pounds per acre, and dried down to 1,687 pounds of ear corn, and 21.05 bushels of shelled corn per acre. This is probably not a fair exhibition of the general character of the corn.

LARGE FLINT CORN.

Thorburn's White Flint. One of the late flints that will not ripen in this State. The first tassels did not appear, until August 7th. On August 18th, quite low, many tassels at three feet. About half tasseled, leafy, and some suckers six to eight feet high.

September 25th; fairly well eared, but no ears beyond roasting, ears long and slim. Total crop, 9.3 tons per acre, containing 26.35 per cent. dry matter, or 2.45 tons of dry matter per acre.

Giant Long White Flint. Much like the last, but showing the first tassels six days earlier. On August 18th, small stalks, with a few ears, showing cob, fairly good stand by some replanting. The average hill contained nine stalks, four tassels, and three ears.

September 25th. No boiling ears, large, long cobs. Total crop, 10.2 tons per acre, containing 25.23 per cent. dry matter, or 2.57 tons dry matter per acre.

SMALL DENT CORN.

Queen of the Field. A medium sized yellow dent corn showing the first tassel July 28th, and the first roasting ear August 22d. On August 18th, all tasseled, stalks small, six to eight feet high, fairly eared, and showing kernels; corn worm already working badly. Average per hill, four stalks, three tassels, and two ears.

September 25th, ears fairly ripened. Total crop, 11.4 tons per acre, containing 32.2 per cent. of dry matter, or 3.67 tons of dry matter per acre. The green ears weighed 6,266 pounds per acre, dried down to 2,531 pounds ear corn, and

30.1 bushels shelled corn per acre.

Huron. Quite like the last and ripening at the same time. On August 18th, stalks quite slim, seven feet high, ear medium, extra good stand; average per hill, five and one half stalks, five tassels, and three and one-half ears.

September 25th; ears fairly ripened. Total crop 9.2 tons per acre, containing 32.2 per cent. of dry matter, or 2.96 tons of dry matter per acre. The green ears weighed 5,423 pounds per acre, dried down to 2,892 pounds of ear corn and 43.0 bushels shelled corn per acre.

White Pearl. A medium sized white dent corn, showing the first tassel July 28th, and the first roasting ear August 22nd. On August 18th, halfway between the two last; ears quite large and chunky, the most advanced almost to roasting; average per hill, four stalks, three tassels, and two ears.

September 25th, ears nearly ripe. Total crop, 10.7 tons per acre, containing 31.27 per cent. of dry matter, or 3.35 tons of dry matter per acre. The green ears weighed 6,869 pounds per acre, dried down to 3,133 pounds of ear corn, and 43.0 bushels of shelled corn per acre.

Wisconsin Yellow Dent. As small as most of the flint corns showing first tassel August 4th, and first roasting ear August 25th. On August 18th, it was fully tasseled at six to seven feet high, very small stalk and, not many ears, the ears just showing cob, extra good stand without replanting. The average hill contained five stalks, three tassels, and two ears.

September 25th. Corn well ripened and ears well filled out. Total crop 10.8 tons per acre, containing 31.03 per cent. of dry matter or 3.35 tons of dry matter per acre. The green ears weighed 5,905 pounds per acre, and dried to 2,772 pounds of ear corn and 38.7 bushels of shelled corn per acre. This indicates a rather small proportion of cob to shelled corn for Colorado.

Pride of the North. A standard dent corn that has been long raised in Colorado. It was one of the first to show tassel July 28th, and to show a roasting ear August 24th. On August 18th, seven feet high, all tasseled, well eared showing kernels, but no roasting ears. The average hill contained five stalks, three tassels, and three ears.

September 25th. Total crop 12.4 tons per acre, containing 35.88 per cent. of dry matter or 4.45 tons of dry matter per acre. The ears at harvest were nearly ripe and weighed 5,784 pounds per acre. They dried to 2,531 pounds ear corn and 32.3 bushels shelled corn per acre.

Stewart's California Yellow. A medium dent corn, one

of the best. On August 18th, stalks medium, well leafed, tasseling at seven to eight feet, showing silk on one-fourth of the stalks, extra stand with but little replanting. It is a good looking corn now, and looks good for much more growth.

September 25th. Ears fairly well ripened. Total crop, 11.2 tons per acre, containing 33.98 per cent. of dry matter, or 3.87 tons of dry matter per acre. The green ears weighed 6,250 pounds per acre, and dried down to 3,374 pounds of ear corn, and 34.4 bushels of shelled corn per acre.

LARGE DENT CORN.

Mastodon. A large, late ensilage corn, showing no tassel until August 8th. On August 18th, nine to eleven feet high, about the best in the field at this date. Very leafy, a little silk, showing a fair stand, with some replanting; a few suckers.

September 25th. Fairly eared, in roasting stage; very large, heavy ears but not many of them. Total crop, 12.5 tons per acre, containing 23.91 per cent. of dry matter, or 2.79 tons of dry matter per acre.

Chester County Mammoth. One of the standard large, late corns, showing the first tassel August 10th. On August 18th, fairly good stand, with little replanting, extra good growth, nine to ten feet high; heavily eared for an ensilage corn. Ears in silk.

September 25th. Full roasting stage, fairly well eared, large, nice ears, but none ready to glaze. Total crop 10.6 tons per acre, containing 27.42 per cent. of dry matter, or 2.91 tons of dry matter per acre.

Red Cob. This is an excellent corn, but the seed planted on this part of the farm, proved poor. The Red Cob was used as the principal field corn on the farm and gave good results, but the seed used for the main crop was from a different source. On August 18th, poor stand, with much replanting, badly mixed seed, tasseling very low, four to six feet high, to top of tassel, very unsatisfactory looking; only a few large stalks. In the main crop at harvest time many stalks were found with the bottom of the ear seven feet from the ground.

September 25th. Ears large, a few in the roasting stage. Total crop, 11.6 tons per acre, containing 25.43 per cent. dry matter, or 2.96 tons dry matter per acre.

Champaign County Prolific. Ripening about the same time as the Red Cob and showing no tassel till August 5th. On August 18th, a good stand after much replanting, stalks about medium, seven to ten feet high, no ears.

September 25th. A few ears, and those, in the roasting stage or earlier, about one tenth beginning to glaze. Total crop, 11.5 tons per acre, containing 24.95 per cent. of dry matter or 2.87 tons of dry matter per acre.

Leaming. One of the best of the medium late fodder corns showing the first tassel August 9th. On August 18th, tasseling at eight to nine feet, leafy, vigorous, not large stalks, showing a few ears and some silk, no boiling ears. The average hill contained four stalks, three tassels, and one ear. There were no suckers; the extra stalks seemed to be from replanting.

September 25th. Well eared, part of the field almost ripe, but the ears not well filled out, the end third almost bare of corn, badly eaten by worms. Total crop, 15.4 tons per acre; containing 29.31 per cent. dry matter or 4.51 tons of dry matter per acre.

Giant Fodder. One of the latest corns grown. On August 18th, the tassels were just showing on the most advanced; no ears or silk; quite leafy with long, broad leaves; medium stalks for so large a corn, seven to eight feet high, an extra good stand.

September 25th. Ears large, a few just showing kernels. Total crop, 17.5 tons per acre; containing 23.06 per cent. dry matter, or 4.04 tons dry matter per acre.

Virginia Mammoth. A large, late white corn, rather late for Colorado. On August 18th, no ears, scarcely tasseled, and seven to eight feet high; at this date a pretty fair corn.

September 25. No ears but an occasional nubbin. Total crop, 10.4 tons per acre, containing 22.16 per cent. of dry matter, or 2.30 tons of dry matter per acre

Brazilian Flour Corn. The latest variety of all, and also the variety that produced the largest growth of stalk and the most dry matter. On August 18th, seven to eight feet high, all leaves, many suckers, no tassels, will make an extra heavy yield. The first tassel did not appear until August 24th.

September 25th. No ears and scarcely any tassels. Total crop, 18.6 tons per acre, containing 24.87 per cent. of dry matter, or 4.63 tons of dry matter per acre.

In order to give a better idea of the comparative yield of the different varieties, there are given in the tables below, the total yield of the crop for each variety, the amount of dry matter contained, and the yield of shelled corn:

| Variety. | Total Crop per Acre in Tons. | Total Dry Mat-ter per Acre in Tons. | Shelled Corn per Acre in Bushels. |
|-------------------------------|------------------------------|-------------------------------------|-----------------------------------|
| SMALL FLINT CORN: | | | |
| Golden Dew Drop..... | 8.4 | 2.65 | 34.4 |
| Will's 70-Day Gehu..... | 7.1 | 2.33 | 37.8 |
| King Philip..... | 9.6 | 2.41 | 18.9 |
| Sanford..... | 11.7 | 3.75 | 32.3 |
| Longfellow..... | 9.8 | 3.04 | 23.7 |
| Minnesota King..... | 7.1 | 2.01 | 21.5 |
| Average..... | 8.95 | 2.70 | 28.1 |
| LARGE FLINT CORN: | | | |
| Thorburn's White Flint..... | 9.3 | 2.45 | none |
| Giant Long White Flint..... | 10.2 | 2.57 | " |
| Average..... | 9.75 | 2.51 | " |
| SMALL DENT CORN: | | | |
| Queen of the Field..... | 11.4 | 3.67 | 30.1 |
| Huron..... | 9.2 | 2.96 | 43.0 |
| White Pearl..... | 10.7 | 3.35 | 43.0 |
| Wisconsin Yellow Dent..... | 10.8 | 3.35 | 38.7 |
| Pride of the North..... | 12.4 | 4.45 | 32.3 |
| Stewart's California Yellow.. | 11.2 | 3.81 | 34.4 |
| Average..... | 10.95 | 3.60 | 36.9 |
| LARGE DENT CORN: | | | |
| Mastodon..... | 12.5 | 2.79 | none |
| Chester County Mammoth... | 10.6 | 2.91 | " |
| Red Cob..... | 11.6 | 2.96 | " |
| Champaign County Prolific. | 11.5 | 2.87 | " |
| Leaming..... | 15.4 | 4.51 | " |
| Giant Fodder..... | 17.5 | 4.04 | " |
| Virginia Mammoth..... | 10.4 | 2.30 | " |
| Brazilian Flour Corn..... | 18.6 | 4.63 | " |
| Average..... | 13.51 | 3.38 | " |

The average of all the varieties is 11.2 tons of total crop, containing 3.09 tons of dry matter. Those varieties that ripened, averaged thirty-five bushels of shelled corn per acre.

It is evident on the whole, that the dent corns were more productive than the flint, in total crop, in dry matter, and in shelled corn. When a comparison is made between the small and large kinds of each, the difference is not so great. The large, late flint corns are, evidently, not so well adapted to Colorado conditions as the smaller and earlier kinds, but the choice among the dents is not so apparent. Most of them have done well and some of them very well. Any corn that produces four tons of dry matter per acre has made an excellent growth. According to the figures given above the small dent corns average a trifle more dry matter per acre than the large and later varieties. There has always been a dispute among farmers as to whether this dry matter from mature and immature corn had an equal feeding value,

pound for pound. The careful experiments made by the Maine Experiment Station through a series of years seem to show conclusively that the dry matter of the mature corn has the higher feeding value. For every one hundred pounds of dry matter in ripe corn they found seventy-three pounds digestible, while from an equal weight of immature corn, but sixty-five pounds were digested.

If we use these figures we find that of the 3.60 tons of dry matter per acre, yielded on the average by the small dent corns, 2.63 tons are digestible, while of the 3.38 tons yielded by the large dents, 2.20 tons are digestible, showing a difference of 0.43 tons, or sixteen per cent. in favor of the smaller varieties.

The Brazilian Flour corn gave the greatest yield of dry matter per acre. If we consider sixty-five per cent. of this as digestible, we get 3.01 tons of digestible matter per acre. The Pride of the North gave 4.45 tons of dry matter per acre, being the largest yield of the small dents. If seventy-three per cent. of this is digestible, it would give 3.25 tons of digestible matter. Thus, the Pride of the North had more feeding value in its crop, and this crop could be harvested with the labor of handling six tons less weight than the Brazilian Flour Corn. It has the added advantage that if used for ensilage, it will occupy less space and usually keep better and be less acid.

The question as to whether it is better to raise the large or medium dents will have to be settled largely by the conditions of climate. These experiments show that the Poudre Valley is at the extreme northern limit of latitude, at this altitude, for making a profitable growth of the larger varieties. At a lower altitude, or farther south, the larger varieties would do much better, while the smaller varieties would not show a proportional gain. If the results of this season's growth, fairly represent average conditions of this vicinity, the farmer who raises corn for fodder or for ensilage, would better plant about half and half of the medium and large varieties of dent corn. He will then be reasonably sure of good returns, whether the season be long or short, and the mixture of the two in feeding to steers or cows, is probably better than either separately.

Nothing has been said so far of the growing of corn for the grain. Until this past season Nebraska corn could be brought to Colorado about as cheaply as it could be grown. At this season's price of a cent a pound, corn growing would be profitable in most parts of Colorado, especially if care was taken to save the fodder as well as the grain. In the experiments given above, the dent corns yielded more bushels of

shelled corn to the acre than the flint corns, but the latter ripened the earlier. In most parts of Colorado where corn can be raised at all, the smaller dents are probably best for ear corn. Attention should be called, however, to the Wills' 70-Day Gehu, for this grew so rapidly and ripened so quickly that it seems adapted to many parts of Colorado that are considered too cold for corn growing. It did not ripen in seventy days, as its name would indicate, and probably would not do so anywhere in this latitude, but it was ripe long before the first light frosts. It is so small that the hills can be planted near together, even thirty inches apart, and still not be crowded. This distance gives twice as many hills to the acre as the ordinary planting of forty-two inches each way. Next to the Wills' 70-Day Gehu in earliness, come the King Philip, and the Minnesota King. The latter corn shows considerable promise.

ENSILAGE AND THE SILO.

The preservation of green corn by means of the silo has attracted but little attention in Colorado, and yet there is no part of the United States better adapted naturally for its use. The expense of the silo, and labor of filling it, have been the great objections urged against it. Incidentally it has also been claimed that the large corn generally used for ensilage could not be grown in Colorado. Most writers have put the cost of building a silo at \$2 for each ton capacity. This is on the supposition that it is made above ground with double walls to keep out the frost, and a roof to ward off rain and snow. The climatic conditions of Colorado enable a much simpler and cheaper silo to be made and used.

A silo was built on the College Farm the past season to ascertain how cheaply one could be made, and whether such a cheap affair would answer equally as well as the more expensive for the preservation and feeding of ensilage.

Silos in the East are not built below ground because during half the year the ground is saturated with water. No such trouble need interfere with the Colorado farmer. There are many places where a hole eight to twelve feet deep would remain dry the whole year, and such a spot on the College Farm was selected for the silo. It is on a slight slope, and a hole twenty-one feet square and eight feet deep, was dug out with the plow and scraper. The only hand work necessary

was in the corners and on the sides. The dirt was dumped as near as possible to the upper end and the two sides.

Inside this hole a 2x6 sill was laid on the ground, 2x6 studding, twelve feet long, erected every two feet, and a 2x6 plate put on top. This framework was then sheathed on the inside with a single thickness of unmatched, unplanned, rough boards, such as can be bought almost anywhere in the State for \$12 per thousand.

The inside was lined with a single thickness of tarred building paper, held in place by perpendicular slats. The floor was made by wetting and tramping the clay at the bottom, while the stars of heaven made an excellent and very cheap roof.

The dirt was filled in against the sides, and banked up to within two feet of the top, except on the lower side, where were doors reaching from near the top to within four feet of the bottom. Thus, our silo consists of a hole in the ground, lined with one thickness of inch boards and building paper, floored with dirt and without any roof.

The labor was done by the farm hands and teams, and could as easily be done by any farmer on his own farm.

The bill for material stands as follows:

240 feet 2x6 for sill and plate.
528 feet 2x6, twelve feet long, for studding.
960 feet rough boards for sides.

| | |
|---------------------------------------|---------|
| 1,728 feet lumber @ \$12 per M.,..... | \$20.74 |
| Nails, lath, and building paper..... | 7.00 |
| | <hr/> |
| | \$27.74 |

If the silo had a partition running through the middle, dividing it into two pits, each ten by twenty feet, it would make an additional cost of about \$5. Our silo has two such partitions, making four pits, each ten feet square, and the entire cost of materials was \$42.

Such a silo has a capacity of about sixty-four tons of ensilage, so that the cost of materials per ton capacity, varies from 43 to 65 cents, according to the number of partitions. Had the hole been two feet deeper, and the sides two feet higher, with one partition, the two pits would then have been each, ten by twenty feet, and sixteen feet deep, with a total capacity of one-hundred tons of ensilage; while the cost of materials would have been \$44. Thus, a silo can be built in Colorado for less than 50 cents for each ton capacity.

A silo twenty feet square, and sixteen feet deep, is large

enough for thirty head of cows or steers, from November 15th to April 15th.

The labor of filling the silo will always remain the principal objection to its use. Corn can be put in the silo whole, but the cost of filling the silo with whole corn is no less than with cut, while the feeding out of the cut, is so much less work, and it is eaten so much more readily by the cattle, that most corn is run through a fodder cutter before it is put in the silo. We cut the corn last fall into quarter inch lengths. Most farmers could hire the use of a threshing engine for power to run the cutter, but they would have to buy the cutter. This would represent an outlay of \$50 to \$75, or as much as the cost of the silo.

If all the labor and teams are hired, the cost of harvesting corn, cutting it in small pieces, and packing in the silo is about 65 cents per ton.

The ensilage put in the College silo last fall is now being fed out, and proves to have kept very well. When the silo was full it was covered with a small amount of straw and then the dirt from the sides thrown onto the top to form a layer six inches thick. Both the straw and the dirt were soaked with water to make them pack tighter. When the silo was opened, from two to three inches of ensilage were found to be spoiled, under the straw and in the corners, for a little greater depth. Below this the ensilage has kept remarkably well. No eastern silo with double walls of matched lumber could produce any better. The average losses in silos are about twenty to twenty-five per cent. of the weight of the corn put in, while so far, in our feeding, the losses have been but a little more than ten per cent.

THE LOSS OF FODDER CORN IN DRYING.

It is believed by most farmers that, in the dry climate of Colorado, fodder corn, where cut and shocked in good shape, cures without loss of feeding value, and that the loss of weight that occurs is merely due to the drying out of the water. A test of this question was made in the fall of 1893, and the results obtained seemed to indicate that fully a third of the feeding value was lost in the curing. This result was so surprising, that the figures were not published, fearing that some error had crept in, though we could not see where there was the possibility of a mistake.

In the fall of 1894, the test was repeated on a larger scale. A lot of corn was carefully weighed and sampled. It was then divided into three portions; one was spread on the ground in a thin layer, the second part was set up in large shocks, containing about 500 pounds of green fodder in each, while the rest was shocked in small bundles. After remaining thus for some months, until thoroughly cured, the portions were weighed, sampled, and analyzed separately. The table gives the losses that occurred in the curing:

| | Large Shocks. Small Shocks. On the Ground. | | |
|-------------------------|--|-----|-----|
| Total Weight. | | | |
| When Shocked..... | 952 | 294 | 186 |
| After Curing..... | 258 | 64 | 33 |
| Loss in Weight..... | 694 | 230 | 153 |
| Per Cent. of Loss..... | 73 | 78 | 82 |
| DRY MATTER. | | | |
| When Shocked..... | 217 | 77 | 42 |
| After Curing..... | 150 | 44 | 19 |
| Loss in Dry Matter..... | 67 | 33 | 23 |
| Per Cent. of Loss..... | 31 | 43 | 55 |

So far as could be told by the eye there had been no loss. The fodder had cured in nice shape, and the stalks on the inside of the bundles retained their green color, with no sign of moulding or heating. And yet the large shocks had lost thirty-one per cent. of their dry matter, or feeding value, the small shocks forty-three per cent., and the corn spread on the ground fifty-five per cent.

On breaking or cutting the stalks, these losses were explained. The juice was acid, and there was a very strong acid odor, showing that an active fermentation was taking place in this seemingly dry fodder. We had noticed this strong odor the fall before and all through this winter. When the fodder corn for the steers is put through the feed cutter, that same strong smell is present.

It can be said, then, that the dryness of the climate in Colorado does not prevent fodder corn from losing a large part of its feeding value through fermentation. Indeed the loss from this source, is fully as great as in the damp climate of New England.

As compared with the losses by fermentation in the silo, the cured fodder shows considerably the higher loss.

GROWTH OF FODDER CORN.

Several of the eastern experiment stations have done considerable work in testing the growth of the corn plant. They find that the corn keeps on growing until cut down by

the frost, and that its growth is most rapid during the month of September. To ascertain whether the same was true for Colorado the following experiment was planned: A plat containing 600 hills of Red Cob corn was divided into halves, September 5th, by cutting alternate hills diagonally across the piece. The 300 hills cut, weighed 1,642 pounds, or thirteen tons per acre. The corn contained 22.80 per cent. of dry matter, or 2.96 tons of dry matter per acre.

On September 29th the other 300 hills were cut, and weighed 1,555 pounds. It contained 23.90 per cent. of dry matter, or 2.94 tons of dry matter per acre. Thus it had dried out a little, and the increase in per cent. of dry matter just balanced the decrease in weight.

During these three weeks, that were expected to show great growth, the plant had practically remained without gain. The days were hot but the nights so chilly that the cold seems to have checked the growth of the corn, although the slight frosts that occurred on several nights scarcely touched the ends of the leaves.

The figures seem to show that, in this part of Colorado, so near to the foothills, corn cannot be depended on to grow after the first week in September, and such varieties should be chosen as will reach the glazing stage by that time.

Notes On Tomatoes.

BY M. J. HUFFINGTON.

The work carried on with this fruit for the season of 1894, was of the nature of a variety test. Most of the new kinds offered in 1893 and 1894 were tried by the side of the leading standard sorts. Only a few of the novelties tried were equal to such standard sorts as Beauty, Perfection, Acme, or Ignotum. The two varieties, Rose Bub, and Seedling No. 2, sent us for trial by Hoover and Moore, of Antlers, Colorado, showed decided merit.

Seeds of the varieties herein described were sown in flats in the forcing house on March 5th, and on March 27th, when about three inches high were transplanted to plant boxes, six by ten inches, partitioned off so that each box held six plants. On April 21st the plants were transferred to a house where the temperature was not so high as in the forcing

house, proper: here they were allowed to remain until June 1st, when they were set in the garden. After setting, a good shower fell and nearly every plant grew. On June 30th, the plants were manured with well rotted compost, two shovels full being placed around each plant and well worked into the soil. Water was applied on the following dates: June 11th, July 3d, July 15th, and July 27th. The ground was thoroughly cultivated after each irrigation, as soon as in proper condition to work. From this year's experience we believe that one or two applications of water, after the fruit begins to ripen, are necessary in order to get the best results. In 1893 water was withheld after the first fruits were picked, and the vines did not seem to suffer for lack of moisture at any time; the same course was followed this season, but not attended with the same degree of success as in 1893, as during the latter part of the summer the vines clearly showed the lack of the proper amount of moisture necessary to perfect the fruit. On September 20th, the vines were cut by frost after which they were pulled and the green fruits gathered.

The accompanying table shows the comparative earliness of the varieties:

| | Date of First Ripe Fruit. | | Date of First Ripe Fruit. |
|---------------------|------------------------------|---------------------|------------------------------|
| Acme | August 15 | Long Keeper | August 15 |
| Aristocrat | " 15 | Meteor | July 24 |
| Atlantic Prize..... | " 15 | Mansfield Tree..... | August 23 |
| Beauty | " 23 | Matchless..... | " 15 |
| Bond's Early Min- | | Maule's Earliest of | |
| nesota | " 15 | All | July 21 |
| Buckeye State | Sept. 8 | Mitchell's New.... | August 15 |
| Chemin Market ... | August 15 | New Stone..... | " 15 |
| Comrade..... | " 23 | Northern Light... | July 30 |
| Crimson Cushion.. | Sept. 8 | Perfection | August 15 |
| Cumberland Red .. | August 15 | Picture Rock..... | " 20 |
| Dwarf Champion .. | July 30 | Potato Leaf..... | " 15 |
| Early Ruby..... | August 20 | Ponderosa..... | " 23 |
| Early Michigan... | July 25 | Puritan..... | " 20 |
| Everett's First of | | Red Cross..... | July 30 |
| All | " 30 | Rosebud | August 15 |
| Fordhook First.... | August 23 | Royal Red..... | " 23 |
| Gold Ball | July 25 | Seedling No. 2 | " 27 |
| Ignotum | August 23 | Table Queen | " 20 |
| Improved Chemin | | Trucker's Favorite | " 20 |
| or Apple..... | " 20 | Vaughan's Earliest | |
| Logan's Giant Seed- | | of All | " 15 |
| ling | " 20 | | |

VARIETIES.

Acme. Seed from Vaughan. This variety is more generally cultivated for market than any other. It is productive, early, fruits large, smooth, color a dark red, solid, and a good shipper. It is largely grown at the south for the northern markets.

Aristocrat. Seed from Livingston, the originator. A dwarf variety more erect than Dwarf Champion, a strong, stocky grower, and early. It possesses the advantage of ripening its fruit rapidly, a desirable feature in a market sort. The fruits are of a medium size, smooth and solid, and of a beautiful scarlet color. Aristocrat has proven to be the best dwarf variety that we have tested.

Atlantic Prize. Seed from Vaughan. A variety which originated in New Jersey, a few years ago. The chief and only merit of the kind is its earliness, it being one of the very first to ripen; fruits of medium size, generally rough, color, a shade of scarlet; rather tender, will not sell when smooth varieties are offered in competition.

Beauty. Seed from Vaughan. This popular variety was originated, and introduced a few years since by Livingston, the tomato specialist of the country. The type is well established. Its season is medium early, fruits large, roundish, smooth, and firm, color, as in Acme; productive, and regarded as one of the very best sorts for market and canning.

Bond's Early Minnesota. Seed from Iowa Seed Co. An early variety, which is only fairly productive; fruits small, roundish, smooth, medium solid, color of Acme. There are other early varieties much better than this.

Buckeye State. Seed from Livingston. This is another of Livingston's productions, though not one that can be recommended for general cultivation, as it is late and ripens very slowly. Where the season is long it would, no doubt, prove very desirable. The fruits are of the largest size, regular, roundish, very smooth, fairly solid, color of Acme.

Chemin Market. Seed from Vaughan. This is a variety of French origin, medium early in ripening, very productive, fruits of medium size, oblong roundish, very uniform, remarkably smooth, fairly solid, of a light scarlet color. This is an excellent variety for home use, but has not been sufficiently tested to be recommended as a market sort.

Comrade. Seed from Gregory & Son. A variety which originated in New England. Its season is second early, ripening with Beauty; fruits of fair size, roundish, smooth,

light scarlet in color; a good variety for home use, but tender for distant shipping.

Crimson Cushion. Seed from Henderson. Originated by Peter Henderson & Co., and introduced by the same firm in 1894. The variety is of the Ponderosa class, and ripens several days later than that sort; fruits large, furrowed at stem, and also rough at blossom end; a shade of purple, solid, and a good keeper. We cannot see wherein this variety is preferable to Ponderosa.

Cumberland Red. Seed from Gregory & Son. A medium early variety, which is quite productive; fruits of fair size, smooth, color as in Ignotum. There are other sorts in the list that are more desirable.

Dwarf Champion. Seed from Vaughan. This is an early sort, which in many sections is highly prized for garden culture, being an upright grower, and thus permitting of close planting. The fruits are of medium size, smooth and solid, color as in Beauty. Altogether, for a dwarf variety, we prefer Aristocrat to Dwarf Champion.

Early Ruby. Seed from Gregory & Son. An early variety which originated in Monmouth county, New Jersey, and was introduced by Peter Henderson & Co., in 1890. The open habit of the plant is a distinctive feature of the variety, and this manner of growth accounts in part for its earliness, as the sun has a better chance to reach and ripen the fruits than with varieties of dense and more upright growth. Fruits are of medium size, generally rough, some fairly smooth, light scarlet in color, rather tender.

Early Michigan. Seed from D. M. Ferry & Co. This variety was introduced by D. M. Ferry & Co., in 1894. Its season is early, fairly productive, fruit small, smooth, the smoothest of the very early sorts, scarlet in color, not productive or large enough for a profitable market variety.

Everett's First of All. Seed from J. A. Everett & Co. A variety introduced by J. A. Everett & Co., Indianapolis, Ind. It is early, but not the earliest, medium productive, fruits of fair size, quite smooth, solid, light scarlet in color. The variety is not productive enough for a market sort.

Fordhook First. Seed from W. A. Burpee & Co. Originated and introduced by W. A. Burpee & Co., in 1894. It ripens with Acme and Beauty; fruits of good size, roundish, smooth and solid, color as in Beauty; not as early as some, but a sort that will give satisfaction.

Gold Ball. Seed from Henderson & Co. A rank growing variety, very productive for a tomato of its class; fruit small, oval, smooth, a beautiful golden yellow, firm and solid; fine for preserving or pickling, but its size, shape, and

color are against it as a market variety.

Ignotum. Seed from Michigan Agricultural College, in 1888. This variety originated at the Michigan Agricultural College, in 1887, and was introduced in 1889. It possesses many points of excellence; its season is early, fruits large, regular in shape, solid, and remarkably smooth, of a bright scarlet color; a desirable variety for market and canning.

Improved Chemin or Apple. A variety sent us for trial by Hoover & Moore, of Antlers, Colorado, which seems to be identical with Chemin Market obtained from Vaughan.

Logan's Giant Seedling. Seed from J. A. Everett & Co. A medium variety in time of ripening, fruits very large and the greater part of them very rough; a few fairly smooth, solid, of a pinkish purple color, resembles Ponderosa somewhat, though not so desirable as that variety.

Long Keeper. Seed from Vaughan. A variety ripening as early as any of the desirable market sorts; fruits of medium to large size, very smooth, walls thick and solid; an excellent keeper, color as in Beauty. This is a desirable tomato both for home use and for market.

Meteor. Seed from J. M. Thorburn & Co. A dwarf variety introduced by Thorburn & Co., in 1894, which resembles Aristocrat in habit of growth. The type does not seem to be well fixed; from twelve plants three types of fruit were noted, one of a bright scarlet, another similar to Acme in color, a third, a light scarlet and very much wrinkled. Aristocrat and Dwarf Champion are both preferable to Meteor.

Matchless. Seed from W. A. Burpee & Co. This is a variety of the Ignotum type, which was originated and introduced by W. A. Burpee & Co. It is medium early in time of ripening, fairly productive, fruits of good size, very smooth, of a beautiful scarlet; a good variety, though not as productive as some.

Mansfield Tree. Seed from Vaughan. A variety of the Ponderosa class, medium to late in time of ripening, productive, fruit large, quite firm, very rough, of a purplish color; not at all a desirable kind.

Maule's Earliest of All. Seed from W. H. Maule. This variety was introduced by W. H. Maule, of Philadelphia, in 1894. It was the first to ripen. It is productive, fruits of medium size, rough, of a light scarlet, rather tender. The variety is desirable only for its earliness.

Mitchell's New. Seed from Gregory & Son. A medium early variety, very much like Ignotum, fairly productive, fruits of good size, smooth and of an attractive scarlet. This is a good variety of the scarlet class.

New Stone. Seed from Vaughan. This is another of Livingston's productions, medium in time of ripening, fairly productive, fruits of good size, roundish, smooth, and very solid, light scarlet, an excellent shipper. Altogether this is a desirable sort.

Northern Light. Seed from J. M. Thorburn & Co. A dwarf compact growing variety, introduced by Thorburn in 1894. In this as in Meteor, the type does not seem to be well established; two forms of fruit were noted, one very small, smooth, bright scarlet; the other of good size, somewhat wrinkled at the stem, a shade of scarlet.

Perfection. Seed from Vaughan. A variety originated by Livingston, medium early in season, fruits of good size, smooth and solid color as in Beauty. This is a popular sort wherever grown.

Picture Rock. Seed from Iowa Seed Co. This new tomato was introduced by the Iowa Seed Co., in 1894. Its season is early, fairly productive, fruits of medium size, very regular and smooth, color a bright scarlet. The variety is worthy of trial.

Potato Leaf. Seed from Michigan Agricultural College. This is a distinct variety originated by Livingston & Son, and introduced by them in 1887. The foliage resembles that of the potato, as the name implies. It is medium early, productive, ripens rapidly, fruits of medium size, very smooth and solid, color as in Beauty; a fine tomato for canning and market.

Ponderosa. Seed from Peter Henderson & Co., who originated the variety, and introduced it in 1892. In 1893 the variety appeared to be not well fixed, there being four distinct types of fruit, but in 1894 every plant was true to the type. Its season is medium, fruits very large, some specimens weighing over a pound; quite smooth for so large a tomato, somewhat ridged about the stem, very solid, slow in ripening, color a pinkish purple.

Puritan. Seed saved at Michigan Agricultural College, in 1888. A variety of New England origin, introduced by Rawson, of Boston. Its season is early, productive, fruit large, occasionally slightly furrowed about the stem, of a bright scarlet color, a desirable tomato of the scarlet class.

Rcd Cross. Seed from Gregory & Son. A variety ripening medium early, fairly productive, fruits of medium size, smooth, of a light scarlet, rather tender for much handling, though good for home use. There are other varieties in the list that are far better.

Rose Bud. Seed sent us for trial by Hoover & Moore, of Antlers, Colorado. A strong growing variety of the Potato Leaf class, productive, early, ripening as early as Vaughan's Earliest of All, Bond's Early Minnesota, and Atlantic Prize, and before Fordhook First, and Early Ruby, although only a few days; the fruits are of good size, remarkably smooth, solid, color as in Acme and Beauty. We consider this a promising variety.

Royal Red. Seed from Livingston & Son, originators. This variety is medium in time of ripening, very productive, fruits of large size, generally smooth, solid, color a beautiful red. This is a desirable tomato either for home use, market, or canning.

Seedling No. 2. Sent us for trial by Hoover & Moore, of Antlers, Colorado. The variety ripens a few days later than Beauty, fruits of medium to large size, roundish, free from ridges or furrows, very solid, of an attractive scarlet. A variety that will give satisfaction.

Table Queen. Seed from Peter Henderson & Co., introducers. A variety ripening in mid season, productive, fruits of large size, fairly smooth, some specimens much wrinkled, color as in Beauty, solid, and apparently a good shipper.

Trucker's Favorite. Seed from Burpee & Co. This is a medium variety as to season, productive, but ripens slowly, requiring a long season to realize best results; fruits large, roundish, smooth, solid, walls thick, which renders it a good shipper, color as in Beauty.

Vaghan's Earliest of All. Seed from Vaughan, the originator. This is a variety, the only merit of which is earliness; fruits small, uniformly rough, of a light scarlet color, tender.

SUMMARY.

First: The six varieties producing the largest amount of fruit by weight, from August 20th to September 1st, were Maule's Earliest of All, Vaughan's Earliest of All, Atlantic Prize, Perfection, Rose Bud, and Ignotum. Each of the first three varieties yielded very nearly the same quantity of fruit within the period designated, which was from three and a half to six times as much as that produced by the three latter sorts.

Second: While the extra early varieties are desirable, where extreme earliness is aimed at, yet when the smooth, solid kinds come into market, there is little or no demand for the former which are generally rough and tender; hence those growing tomatoes for market should plant both the extra early and the second early or main crop in order to prolong the season.

Third: For second early, or main crop varieties, we recommend the following: Acme, Beauty, Perfection, Ignotum, Puritan, and Long Keeper.

Fourth: The best varieties for canning are Beauty, Perfection, Long Keeper, Puritan, Ignotum, and Royal Red. The three former varieties are of a dark red, or purplish color, and the three latter of a bright red or scarlet.