New York Agricultural Experiment Station.

PETER COLLIER, DIRECTOR.

BULLETIN No. 30—NEW SERIES.

MAY, 1891.

CABBAGE AND CAULIFLOWER.

A COMPARATIVE TEST OF IMPORTED VERSUS AMERICAN GROWN SEED.

TOMATOES.

A COMPARISON OF YIELDS OF SEVERAL VARIETIES GROWN BY DIFFERENT METHODS.

A DESCRIPTION OF VARIETIES.

TESTS WITH SEED FROM GREEN AND RIPE FRUITS.

GENEVA, N. Y.

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BULLETIN No. 30—NEW SERIES.

CABBAGE AND CAULIFLOWER.

A COMPARATIVE TEST OF IMPORTED VERSUS AMERICAN GROWN SEED.

For several years the market gardeners through the Eastern States have found that seed from a carefully selected strain of several of the leading varieties of cabbage grown in this country, gave better results than imported seed of the same varieties, but it has been only recently that the claim that the cauliflower seed could be grown here that would approximate in value seed grown in Germany or France. Especially has the claim been made that cauliflower and cabbage seed grown on Puget Sound, Wash., excelled all others in vigor of product.

In order to investigate this matter, there was a trial made in 1889 between two varieties from eastern grows seed, and two vareities from seed grown in Washington. The results of this trial as given in table No. 1, were in favor of the Washington grown seed. But to test the matter further the same test was continued in 1890, using both cabbage and cauliflower seed from three different sources, imported, Long Island grown and Washington grown. Tables Nos. 2, 3, 4 and 5 will give the results obtained. It will be noticed that while there is a wide difference in the weight of a given number of seeds of some of the varieties, notably the Improved Jersey Wakefield cabbage (March), the results do not show that any advantage is thereby obtained in the marketable product, but the data gathered through the growing season shows that the largest and heaviest seed made a quicker germination and a more vigorous growth immediately after being transplanted. These are both valuable considerations, as it often happens that a severe drouth, or the attacks of the flea beetle,

cause the loss of a large number of plants in the seed bed or before they recover from the shock of transplanting.

As each head was allowed to attain its maximum growth the record of earliness has been omitted, but there was but little difference in the time of edible maturity of the cauliflower or between the early varieties of cabbage. Tables No. 2 and 4 give results from seed sown in greenhouse February 24, pricked out into pots April 2, and set in open ground April 29. In order to make the test as complete as possible, two plantings were made, the first as recorded, the second from seed sown in cold frame April 22 and set in open ground July 8. The late set plants of each variety were a continuation of the rows of those set early. See tables 4 and 5. The results seem to show that neither the Long Island nor the Puget Sound grown seed are in any way inferior to the imported seed, and as it is claimed it can be grown and sold cheaper than the imported seed, there is no doubt that the industry of growing these seeds will be developed to quite an extent.

It will be seen by the tables that only about half of the early planted cauliflowers developed heads, 58.46 per cent., while 96.12 per cent. of the late planted reached maturity. In the case of the cabbage 75.61 per cent. of those planted early made marketable heads, although half of the varieties were those usually termed winter cabbage and seldom planted for summer use. The late planting of cabbage gave 96.34 per cent. of marketable heads. The varieties usually grown for an early crop giving better results than the same varieties sown early. At the time the largest per cent. of the early sown cauliflower and cabbage were of marketable size the wholesale price of them was cauliflower $12 a hundred, cabbage $6 per hundred, while at the time of cutting the bulk of the later sowing the price had declined to $6 for cauliflower and from $2.50 to $3.00 for cabbage, thus making the early planting of both more remunerative than the late ones, even with the low per cent. of heads.

In conclusion it might be well to say that of the many varieties of both cauliflower and cabbage planted there was found only two spurious plants, those occurring in an early variety of cabbage. This speaks well for the careful methods of the seedsmen from whom we received the seeds necessary to carry on the test.

TABLE I.

CAULIFLOWER.

VARIETIES.	Seeds from.	Origin of seed.	No. plants set.	No. heads harvested.	Average diameter.	Average weight.
					Inches.	Lbs.
Early Puritan.....	Ferry ...	Eastern....	20	13	5½	5½
Early Erfurt	March...	P. S.....	20	19	8½	5¼
Snow Ball..	March...	P. S.....	20	20	7½	3
Vick's Ideal.....	Vick	Eastern....	20	20	7	2¾

TABLE II.

EARLY CAULIFLOWER.

VARIETIES.	Seed from.	Origin of seed.	Weight of 300 seeds in grains. *	Number of plants set.	Number of heads harvested.	Average diameter.	Average wt.
						Inches.	Lbs
Early Padilla.....	Till		15.430	20	12	7	4
Early Snowball.....	Till	Imp. Germany	18.312	20	10	7¾	2¾
Erfurt Dwarf Earliest.....	Hal	Imp. Germany	15.632	20	14	7	2¼
Early Alabaster.....	J. & S.		19.922	20	10	7¼	2¼
Erfurt Dwarf Earliest.....	March	P. S.....	13.742	20	20	7¼	3½
Early Padilla.....	Till	P. S.....	16.819	20	11	9	4
Kronk's Perfection	Far.....	Imp. France...	18.173	20	11	8	3
Landreth's First...	Land...	Imported.....	14.881	20	10	7½	2¼
La Normand.....	Vil.....	Imp. France...	11.535	20	6	7	2
La Normand.....	Hal	Imp. France...	10.346	20	5	10	2½
Perfection.....	March	P. S.....	17.502	20	14	8	2¾
Snowball.....	March	P. S.....	17.607	20	14	8	2
Thorburn's Gilt Edge.....	Thor ...		22.682	20	15	8	2¾

*Grains reckoned as Troy weight.

TABLE III.

LATE CAULIFLOWER.

VARIETIES.	Seed from.	Origin of seed.	Weight of 300 seeds in grains.	Number of plants set.	Number of heads harvested.	Average diameter.	Average. wt.
						Inch's.	Lbs.
Early Padilla.....	Till		15.430	18	15	5⅔	1¼
Early Snowball.....	Till	Imp. Germany	18.312	20	19	6¼	2½
Erfurt Dwarf Earliest.....	Hal	Imp. Germany	15.632	20	20	7	2½
Early Alabaster.....	J. & S..		19.922	20	20	7	2¾
Erfurt Dwarf Earliest.....	March	P. S.....	13.742	20	18	6½	2½
Early Padilla.....	Till	P. S.....	16.819	20	19	5¾	1¾
Kronk's Perfection	Far.....	Imp. France...	18.173	20	19	5¾	2¼
Landreth's First...	Land...	Imported	14.881	20	20	5½	2½
La Normand.....	Vil	Imp. France...	11.535	20	20	7¾	2¼
La Normand.....	Hall ...	Imp. France...	10.346	20	20	5	2½
Perfection	March	P. S.....	17.502	20	18	5½	2¾
Snowball.....	March	P. S.....	17.607	20	20	7¾	2¼
Thorburn's Gilt Edge.....	Thor ...		22.682	20	20	5¾	2¼

TABLE IV.

EARLY CABBAGE.

VARIETIES.	Seed from.	Origin of seed.	Weight of 300 seeds in grains.	Number of plants set.	Number of heads harvested.	Average diameter.	Average wt.
						Inch's.	Lbs.
All Seasons..	Till	P. S	17.245	20	17	8½	6½
Brunswick	Till	Imp. France	12.241	20	16	7½	4½
Bleichfield's Giant	Hen	Imp. England	15.896	20	18	3⅔	6⅞
Burfee's All Head Early	Bur		14.879	20	14	4½	8
Cleveland's Conqueror	Cleve	L. I	17.823	20	16	5½	8
Cleveland's Intermediate	Cleve.	L. I	18.164	20	7	8½	4½
Etamps	Vil	Imp. France	12.859	20	10	7½	3½
Early Jersey Wakefield	Till	P. S	17.257	20	7	5½	3
Early Winnigstadt	Till	P. S	12.082	20	17	7½	3¼
Improved Early Jersey Wakefield	March	P. S	53.317	20	17	6	2¾
Excelsior Flat Dutch	Till	P. S	17.585	20	18	8	5
Henderson's Early Summer	Till	P. S	18.837	20	19	7½	4
Milan	Vil	Imp. France	11.772	20	20	8¾	7¼
Mann Rock Red	Cleve	L. I	14.492	10	2		—
Marblehead Mommoth	Til	P. S	23.745	20	18	11⅓	13
Oxheart	Vil	Imp. France	16.282	20	9	5½	7½
Premium Flat Dutch	Hal	L. I	18.127	20	16	10¾	6
Premium Flat Dutch	Till	P. S	20.877	20	17	9	7
Premium Flat Dutch	Till	P. S	23.048	20	19	8½	6
Vandegaw	Till	L. I	14.341	20	14	7	4½
Vandegaw	Hal	L. I	17.005	20	19	7	5

TABLE V.

LATE CABBAGE.

VARIETIES.	Seed from.	Origin of seed.	Weight of 300 seeds in grains.	Number of plants set.	Number of heads harvested.	Average diameter.	Average wt.
						Inch's.	Lbs.
All Seasons	Till	P. S	17.245	20	20	9½	12
Brunswick	Vil	Imp. France	12.241	20	20	7½	8
Bleichfield's Giant	Hen	Imp. England	15.896	20	19	8	10
Burfee's All Head Early	Bur		14.879	20	19	7½	7½
Cleveland's Conqueror	Cleve	L. I	17.823	20	20	8½	8¼
Cleveland's Intermediate	Cleve	L. I	18.164	20	20	9½	7¾
Etamps	Vil	Imp. France	12.859	20	15	6	3¾
Early Jersey Wakefield	Till	P. S	17.257	20	20	7¾	7¾
Early Winnigstadt	Till	P. S	12.082	20	5	5	5¼
Improved Early Jersey Wakefield	March	P. S	53.317	20	19	7¾	4¼
Excelsior Flat Dutch	Till	P. S	17.585	20	20	9⅓	9
Henderson's Early Summer	Till	P. S	18.837	20	20	8¼	9½
Milan	Vil	Imp. France	11.772	20	7	9¼	
Mann Rock Red	Cleve	L. I	14.492	10	20	7	8
Marblehead Mammoth	Till	P. S	23.745	20	17	7	
Oxheart	Vil	Imp. France	16.282	20	20	7½	9
Premium Flat Dutch	Hal	L. I	18 127	20	20	8½	9
Premium Flat Dutch	Till	P. S	20.877	20	20	7¾	9
Premium Flat Dutch	Till	P. S	23.048	20	20	8	7½
Vandegaw	Till	L. I	14.341	20	20	9	9
Vandegaw	Hal	L. I	17.005	20	20	9	9½

TOMATO TESTS.

A COMPARISON OF YIELDS OF SEVERAL VARIETIES GROWN BY DIFFERENT METHODS.

In these tests seven plants each of nineteen of the newer varieties of tomatoes were used. The plants were set in a young vineyard that had been top-dressed with bone meal at the rate of two hundred pounds per acre, the soil being in a good state of tilth. In setting the plants, each row was run east and west. A wire trellis was then run north and south, to which the eastern plant of each variety was trained. The next plant in each row was trimmed at frequent intervals, thus allowing the sunlight to penetrate to the soil and also reach every fruit. The three following plants were allowed to grow at will. The sixth plant was trained to a stake being tied up as required, and the extreme western plant was trained to a wire trellis. The trimmed plants in almost every case gave the first ripe fruits, but both the west trellis and staked plants ripened ten fruits as early as did the trimmed plants.

It will be noticed also that both the west trellis and staked plants of every variety yielded a very small crop. This is accounted for by the fact of there being a heavy clay knoll running through the vineyard. While this knoll was well manured the previous year, and was in good tilth when the plants were set, the rains of the early summer caused it to become very heavy and to bake through the hot season. This baking or drying of the soil may have had the effect of hastening the ripening of the fruits on the staked and west trellis plants. During the fruiting season there was a very heavy rainfall, there being for the months of August and September over ten inches, notwithstanding which there was very little of the tomato rot; and the only effect of the frequent showers was to retard the ripening of the fruits. In fact it has been generally noticed that the tomato ripened slowly through this section of the state. By referring to the table it will be seen that in every case but one the yield of ripe fruit was smaller than the yield of green fruit, making the yield of ripe tomatoes fall below the average. In this immediate vicinity the green fruit sold for about as much as the midsummer and late ripe ones, causing but little loss to the grower. It will

also be noticed that the plants allowed to grow at will gave a larger yield per plant than any others, but the fruit was much later in ripening, in fact the greater portion of green fruits were picked from those plants.

The fruits on plants tied to trellis or stake were on an average of larger size and more symmetrical. For a small garden either system will be found preferable to allowing the vines to grow at will, but in commercial growing the advantages are not enough to pay. The Chemin, Early Ruby and Cleveland's No. 115 proved the best of the early varieties. Matchless, McCullums and Cleveland's No. 57 giving the largest yield. Least anyone should be deterred from planting a quantity of tomatoes by the small yield obtained here, it will be well to state that this locality is not considered equal to other parts of the state as a tomato growing section.

TOMATOES—TABLE OF YIELD.

Varieties.	East trellis.		Matted plants.		Trimmed plants.		Staked plants.		West trellis.		Average yield per plant.	
	No. fruits.	Wt. fruits	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.	No. fruits.	Wt, fruit.
		Lbs. Oz.		Lbs. Oz.		Lbs. Oz.		Lbs. Oz.		Lbs. Oz.		Lbs. Oz.
Ripe Atlantic Prize	33	10–12	92	30–4	42	13–8	9	3–8	12	3–8		
Green " "	22	4–	156	26	11	2	28	3–4	22	3–4		
Total	55	14–12	248	56–4	53	15–8	37	6–12	34	6–12	61	14–1
Ripe Brandywine	29	18–8	59	25–4	28	10–4	13	6	7	3		
Green "	94	21–12	184	37–12	60	11	28	5–4	17	4		
Total	123	40–4	243	63	88	21–4	41	11–4	24	7	74	21–5
Ripe Chemin	26	8–12	108	31–12	12	3	24	7	15	4–4		
Green "	80	25–12	276	42	100	12	55	6	48	6		
Total	106	34–8	384	73–12	112	15	79	13	63	10·4	106	20–15
Ripe Dwarf Champion	15	6–12	41	15–12	12	3–8	16	4–12	5	1·12		
Green " "	50	13–12	122	32	41	6–4	11	3	24	6		
Total	65	20–8	163	47–12	53	9–12	27	7–12	29	7·12	47·6	13–2

TOMATOES—TABLE OF YIELD.

VARIETIES.	East trellis.		Matted plants.		Trimmed plants.		Staked plants.		West trellis.		Average yield. per plant.	
	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits	No. fruits.	Wt. fruits.
Ripe Early Ruby	34	12 4	72	21-12	40	11-12	10	3	13	4		
Green "	53	18-4	162	20-4	39	5-4	43	6	31	2		
Total	87	30-8	234	42	79	17	53	9	44	6	71	14-3
Ripe Glen Cove	24	8-12	81	32·8	20	10	9	4-12	6	2-8		
Green "	106	22-12	185	36-12	85	26-8	17	2	49	6		
Total	130	31-8	266	69-4	105	36·8	26	6·12	55	8-8	83-1	21-5
Ripe Haines No. 64	36	16·4	65	26	24	9-12	12	4	11	5-8		
Green "	99	24-12	135	27-4	70	13	36	3-4	40	5		
Total	135	41	200	53·4	94	22-12	48	7-4	51	10-8	75·3	19-1
Ripe Ignotum	30	15	55	27-4	12	5-8	7	4	22	7-8		
Green "	77	25-8	130	33-12	36	9-12	28	7-4	40	7		
Total	107	40-8	185	61	48	15-4	35	11-4	62	14-8	62-6	20·2

TOMATOES—TABLE OF YIELD.

Varieties.	East trellis.		Matted Plants.		Trim'd plants.		Staked plants.		West trellis.		Average yield per plant.	
	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.
Ripe Ignatum, ex. select'd	19	11-4	54	26-8	19	10	8	4	29	5-12		
Green "	123	37-4	145	33-8	41	9-8	22	8	31	8		
Total	142	48-8	199	60	60	19-8	30	12	60	13 12	71-1	21-6
Ripe Matchless	15	8-12	61	26-12	24	9	22	9-8	20	8-12		
Green "	74	31	192	53	66	17	32	7-8	58	13-4		
Total	89	39-12	253	79-12	90	26	54	17	78	22	80	26-2
Ripe McCulloms	13	8	53	28	10	4	4	1-8	19	10		
Green "	69	27	162	45-8	38	19-8	64	18-4	67	21		
Total	82	35	215	73-8	48	23-8	68	19-12	86	31	72-5	26
Ripe Cleveland, No. 57	35	7-12	64	33-12	24	9-8	24	10-8	25	9-8		
Green "	76	17	134	28 4	42	10-4	42	11-8	82	13		
Total	111	24-12	198	62	66	19-12	66	22	107	22-8	80	215

TOMATOES—TABLE OF YIELD.

VARIETIES.	East trellis.		Matted plants.		Trim'd plants.		Staked plants.		West trellis.		Average yield per plant.	
	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.	No. fruits.	Wt. fruits.
Ripe Clevelands No. 115	55	14	148	41-4	40	13	38	8-12	42	7-12		
Green " "	94	19·8	211	27-4	70	8·8	78	11-12	91	9 4		
Total	149	33-8	198	68 8	110	21·8	116	20-8	133	17	122-3	23
Ripe Nichols Stone			47	12	55	15-12	11	6·4	17	8-12		
Green " "			115	32-12	27	9	56	13	30	5-8		
Total			162	44 12	82	24-12	67	19-4	47	14-4	35	14·3
Ripe Pres. Cleveland	33	9-4	74	24-12	35	8-8	18	6·8	4	1-8		
Green " "	108	30-4	211	44	78	17	57	14	24	5-12		
Total	141	39-8	285	68-12	113	25-8	75	20·8	28	7-4	91-5	23
Ripe Red Cross	29	9·12	92	31-12	28	11-4	5	2	7	2-8		
Green "	76	23-8	255	38	57	15	40	7-8	28	6-8		
Total	105	33 4	347	69-12	85	26-4	45	9-8	35	9	88	20-7

A DESCRIPTION OF VARIETIES OF TOMATOES TESTED.

Atlantic Prize. Of but medium growth. Not very productive, but early. Fruits of medium size, usually smooth and of good color.

Brandywine. Of rank growth. Foliage large and long leaf stalks. Very productive. Fruits average large size, smooth and a very fine shade of red. Showy when sliced. Season medium.

Chemin. Of rank growth. Plants very productive. Fruits under size, flattened on sides, giving them a squared appearance. Flesh of a mealy nature. Very fine flavor.

Dwarf Champion. This has not been as productive this year as last. Fruits of good size and fine quality. Season medium.

Early Ruby. Growth weak. Foliage finely cut. Fairly productive. Fruits small and irregular. Season early.

Glen Cove. Of rank growth and foliage large. Season medium. Very productive of large sized fruits. Smooth and of fine appearance. Very meaty.

Ignotum. This variety has become very popular on account of its productiveness, fine appearance and keeping qualities. It is certainly a fine acquisition.

Lorillard. Growth stocky, with dark green leafage. Fruits of medium size, round, smooth and fine color. Very meaty.

Matchless. Of rank growth. One of the most productive grown here this season. Fruits large and smooth, often showing flattened sides. Cells numerous, with a large quantity of seeds. Season medium.

McCulloms. This variety ripened its fruits earlier this season than last. Making it a medium season. One of the most productive varieties. Fruits of good size, fine color and good quality.

Cleveland's No. 57. Of rank growth and large foliage. Productive. Fruits of medium size, smooth and very solid, often flattened on blossom end. Season medium.

Cleveland's No. 115. Growth weak and scant foliage. Very early and productive. Fruits of medium size, very solid, often ribbed. A very promising early variety.

Nichols Stone. Vines of vigorous growth. Fruits from large to very large size, firm and of good color. Season medium.

Pres. Cleveland. Of vigorous growth and very productive. Fruits good market size, very meaty and mealy. Season late.

Red Cross. Growth rank and large foliage. Productive. Fruits of good size, very meaty and flesh of a fine color.

Table Queen. Foliage finely cut and very dark green. Fruits very irregular. Not productive. Season early.

TESTS WITH GREEN AND RIPE SEED OF TOMATO.

This test was started in 1883 and has been carried on up to date and in every case giving from seeds of green fruits a very early product.

The variety chosen for this test was Cook's Favorite, of which variety six samples were taken, the first showing no signs of maturity, the second pale green, the third showing a faint tinge of red, and so on to the sixth which was fully ripe. In the spring of 1884 these seeds were planted under uniform conditions and the results obtained are as follows: The plants from the greenest seed ripened ten fruits before those from any other sample had ripened one. The plants from ripe seed were the last to ripen fruits. The seeds from green fruits however vegetated very poorly, and the plants were not as vigorous as those from ripe seed, but were very prolific.*

In 1885 the test was continued; and to intensify the influence of immature seed, the seed was taken from plants grown from immature seed of the previous year. The results obtained are as follows: Both the plants from ripe fruits and those from green fruits ripened one fruit on the same day, but the first ten fruits were on plants from immature seed, a week in advance of those from mature seed. The foliage from those from green seed had a shrivelled appearance, and blighted badly. The fruits were small and decayed rapidly.†

In 1886 the results were the same, there being a difference of seven days in the ripening of the first ten fruits, the same weakened condition of the plants from green seed being noticed. In 1887 there was a difference of nineteen days in favor of the immature seed. The record for 1888 is not available, but in 1889

*See Third Annual Report N. Y. Agricultural Experiment Station (1884) page 224.

†Fourth Annual Report p. 182.

there was a very great difference in the ripening, it being twenty-three days from the ripening of one fruit on plants from immature seed to the ripening of one fruit on plants from mature seed. Notes taken that season say: Plants from mature seeds vigorous and fruits large; plants from immature seed fruits numerous but small; vines weak and fruits exposed to the sun. The season of 1890 gave much the same results, the plants from immature seed ripening fruits ten days in advance of those from mature seed: the growth of vines in 1890 were more vigorous than in previous years and the fruits larger. This was probably due to the fact that the specimen fruit selected for seed in 1889 was of large size, and while very green had nearly obtained its maximum development. It is evident that the immature seed gave the earliest fruits and also that such seed lack vitality to give a large per cent. of germinations, and a good growth of leafage, but it is yet a question of how much further towards a perfectly ripe fruit it will be best to go to procure seed that will give more vigor of plant and still retain the early ripening qualities of immature seed. (Dr. Sturtevant says in regard to this fact in *Garden and Forest*, July 23, 1890, p. 355, "A weakness in the plants has been a serious drawback, and while green seed seems unfitted for immediate use by the grower, yet it is by no means certain but that this feebleness may be trained out by the experimenter.") This will probably be done as suggested above by selecting a medium between very green fruits and entirely ripe fruits. If by being able to select fruits at the proper time we shall hasten the ripening of the largest part of the crop by one week, it will be of immense value to growers. These tests are still being carried on and hopes are entertained of the ultimate success of the experiment.

EXPLANATIONS.

Seeds From.

Till.	J. F. Tillinghast, LaPlume, Penn.
Hal.	V. H. Hallock & Son, Queens, N. Y.
J. & S.	Johnson & Stokes, Philadelphia, Penn.
March.	H. A. March, Fidalgo, Wash.
Far.	R. & J. Farquhar, Boston, Mass.
Land.	D. Landreth & Son, Philadelphia, Penn.
Vil	Vilmorin & Co., Paris, France.

Thor.	J. M. Thorburn & Co., New York, N. Y.
Ferry.	D. M. Ferry & Co., Detroit, Mich.
Vick.	James Vick, Rochester, N. Y.
Bur.	W. A. Burpee & Co., Philadelphia, Penn.
Cleve.	Cleveland Seed Co., New York, N. Y.
P. S.	Puget Sound, Wash.
L. I.	Long Island, N. Y.
Imp.	Imported.