A CONTRIBUTION TO AGRICULTURAL BOTANY: BEING LESSONS FROM TURNIP SINGLING

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A Contribution to Agricultural Botany: Being Lessons from Turnip Singling by A. Stephen Wilson

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A. STEPHEN WILSON

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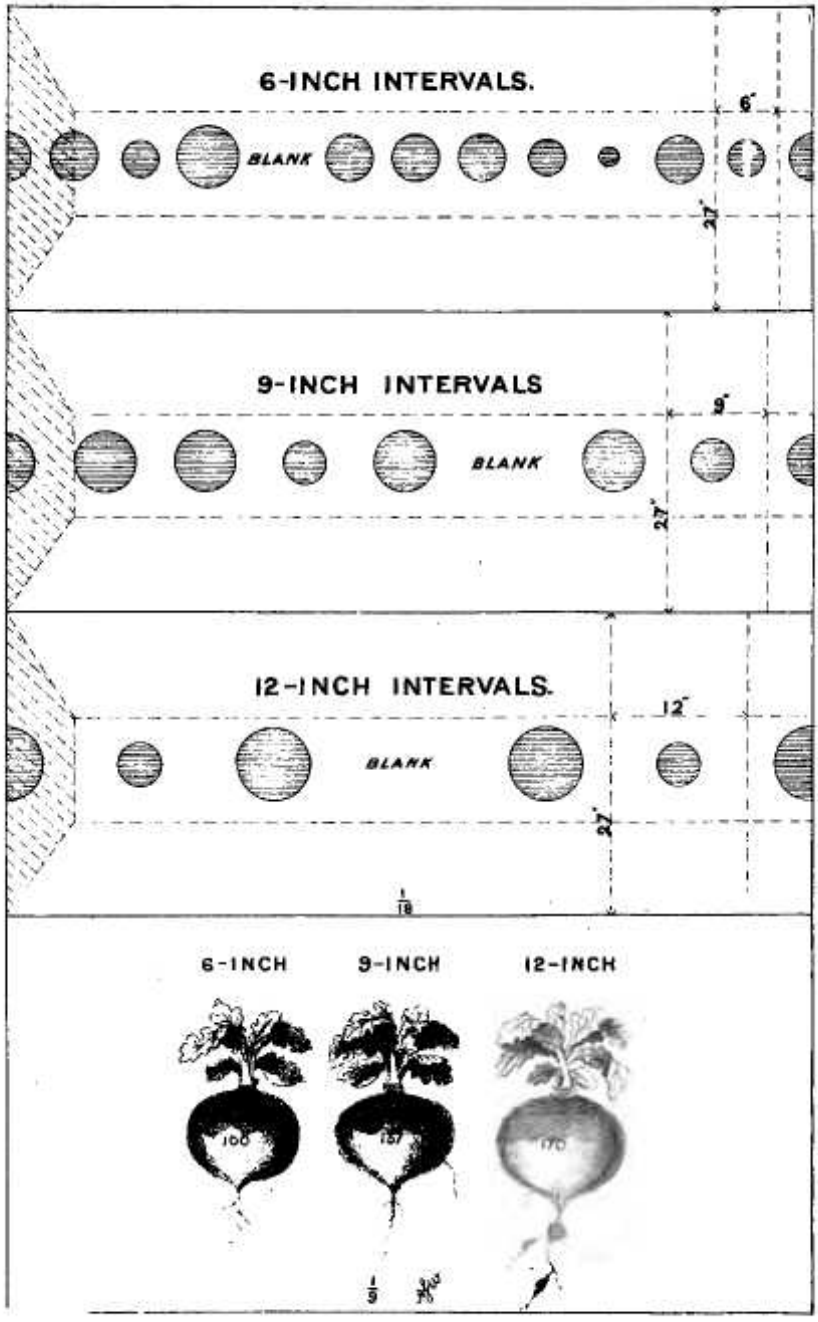
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A CONTRIBUTION

TO

AGRICULTURAL BOTANY:

BEING

LESSONS

FROM

TURNIP SINGLING.

By A. Stephen Wilson,

Author of "The Botany of Three Historical Records."

ABERDEEN: JOHN RAE SMITH.

1879.

NOTE.

There are two principles on which, in any given state of Agriculture, the produce of the land may be augmented: (1) increase of cost, and (2) increase of care. In the present condition of the markets, probably, on all our better-farmedsoils, any augmentation of produce, secured by increased outlay, would result in dimiinshed profits. But increased carefulness is necessarily accompanied by augmented profits; and the present papers, reprinted from the *Daily Free Press*, illustrating one example of augmented produce arising from increased attention, may help to recommend the principle thus suggested.

May, 1879.

AGRICULTURAL BOTANY.

TURNIP SINGLING.

Introductory.

A good deal has recently been done towards clearing up our views on certain points in the manuring of the turnip, and I have thought it might be of some interest to inquire in one or two directions in what way the turnip crop ought to be treated, so that manurial improvements might be more fully taken advantage of. A cattle-feeder does not think he has done all that can be done when he keeps his stalls replenished with the best food. He selects the sorts of cattle most easily fed and of most rapid growth. And he treats them in such a way as to make the food given most effective. The agriculturist must act in an analagous way with his turnips. He must not merely supply his seeds with the best manure; he must select the best seeds; he must find out the sorts which grow rapidly to the largest sizes consistent with the heaviest crops. He must give his plants the proper space to grow in. He must use them "as though he loved them."

Even from this pre-eminently turnip-growing country, the glory of discovering the true cause of finger-and-toe has been carried off by a Russian.

M. Woronin has clearly shown that the destructive clubs on our turnip roots are produced by a mere spore-bearing fungus: an organism which never ascends so high in the scale of vegetation as to produce the least particle of stem. Suppose a small puff-ball to burst within your turnip root, to scatter its spores through the tissues, and each spore to produce a new puff-ball, and you have some idea of a part of the genesis of this relentless enemy of the crucifers. Nothing is left for us but the inglorious drudgery of verification; the finding of a few additional facts; and, if it may be, the application of the whole to some theory of a cure.

I offer this slight contribution as an inducement to others, while not neglecting the chemistry of agriculture, to give a simultaneous attention to its botany.

Lessons from Turnip Singling.

There are about 140,000 seeds of common turnips in a pound, or about 20 seeds in one troy grain. When turnip seeds are sown in 27-inch drills at the rate of 3 pounds to the acre, about fourteen times as many seeds are planted as are intended to come to maturity. The weight of the seeds left to grow is about 3¼ ounces. The operation of leaving the plants of these seeds, and cutting out the other thirteen parts, is called singling.

Now, for what purpose is singling performed? It may be done for various purposes. It may be done in order to produce the largest individual plants; or it may be done to produce the heaviest

aggregate of plants. And the question immediately arises—are the two methods of singling here suggested consistent with each other? Can the heaviest possible aggregate be composed of the heaviest possible individual plants?

If 3 pounds of seed are sown at equal intervals on an acre of 27-inch drills, there will be 420,000 plants, each having a space to grow in of little more than half an inch. These plants will each have room to attain a weight of nearly half an ounce, making the total weight upon an acre about six tons. Experience has shown that fewer and larger plants will give a greater total weight. And the question how many fewer and how much larger will give the greatest possible weight? is a purely experimental question, to be answered only by actual experiment.

If, then, a turnip will not attain its greatest size in a lineal space of half-an-inch, there must be a lineal space in which a turnip will attain its greatest size. Let this length of drill, in which, under ordinary profitable cultivation, a turnip will attain its average maximum weight, be called the maximum individual unit. With the largest possible turnips growing at intervals of this unit, the balance will inform us what is the collective weight upon an acre.

The further question then presents itself, can two or more plants be grown within the length of the individual unit, which shall collectively have an equal, or a greater weight, than the plant in this unit? Whether upon trial, this question shall be answered one way or the other, there arises the idea of a maximum collective unit. And as it is conceivable that the heaviest possible individual plants might compose the greatest possible weight per acre, so it is conceivable that the maximum

collective unit might be the same length of drill as the maximum individual unit. But if two or more plants can be grown in the length of the maximum individual unit, which shall collectively be of greater weight than the single plant, then the maximum collective unit is less than the maximum individual unit, and the heaviest crops will consist of turnips less than the largest.

At the beginning of the present century, turnips were frequently sown broad-cast, and were then hoed so as to leave the plants and the rows at equal distances.* And supposing that it should be found profitable in some cases, to return to this mode of cultivation, the units of space here brought under notice, would be reduced to squares, the proper areas of which would have to be determined by experiment.

These units or spaces in which a turnip can grow to its greatest size, or in which it can grow to such size as to form a constituent of the greatest crop, are the chief objects of the present inquiry. They become amenable to scientific treatment, simply because a turnip is a definite product, and will grow only to a certain size. If a turnip would grow larger and larger by allowing it more and more room, any search after the law of a maximum individual unit would be useless. But as a turnip will grow as large upon a square yard as upon a square acre, we see that vegetable laws, put more or less strict limits on the produce of the land, which no manurial effort can overpass.

On the turnip crop of 1877, I made two experiments in singling, in order to find the interval

* Mr Barclay of Ury surpassed all the drilled crops of his neighbours by this method, producing crops of from 30 to 45 tons, the English acre.