THE GREAT CARROT TRIAL

The usual advice to gardeners is to rotate crops, preferably on a four-year basis, to reduce the possibility of diseases peculiar to a vegetable being passed on the following year. The purpose of "The Great Carrot Trial" was to see if there were indeed problems of that nature caused by growing carrots in the same soil year after year after year. (I had grown climbing French beans and runner beans in the same soil for 20 years and potatoes in the same soil for 10 years with no apparent adverse effects.)

I have had my allotment since 1973 and converted to "no-dig" in the year 2000. After 4 years of not digging, and adding farmyard (ie cow) manure to the surface, I noticed there was a sudden increase in the size of some of my vegetables, especially carrots and beetroot. In my opinion the reason for the sudden increase in the size of vegetables was that, after 4 years, the beneficial soil mycorrhizal fungi had come back to do their good work. I mentioned the increases in size to Matthew Adams of the Good Gardeners' Association and was asked to grow a row of carrots the following year in exactly the same soil as the soil which produced massive carrots. During the years of the Great Carrot Trial I also grew at least one "control" row of carrots a few feet away from the trial row, usually in soil in which carrots had not been grown for a considerable time. My rows are 38 feet long. For all the years of the trial the same seed were used – Carotte de Colmar, a variety of maincrop carrot purchased in France. Often the same packet of seed was used for several years. I have been growing that variety for at least 25 years. I should add that my soil is classified as "clay loam" and that most gardeners in this part of the Chilterns cannot grow carrots. Few try – carrots prefer sandy soil.

YEAR 1 – 2004. This was the first year of growing carrots in that position, when I reported that I had simply enormous carrots. One which did not fork weighed 2 pounds 13 ounces after washing and without its top.

YEAR 2 – 2005. I grew carrots in exactly the same row as in 2004. The March sowing had poor germination owing to adverse weather. I re-sowed in the gaps in May but the results of the re-sowings were poor as usual. But…… the carrots from the March sowing were simply enormous. I did not have time to thin them out so the carrots simply elbowed each other out of the way. The heaviest weighed 1 pound 5.3 ounces. That the size was less than in 2004 I put down to a difficult growing season and the fact that I did not thin them.

YEAR 3 – 2006. It was time for the soil of my trial row to receive a 3 inch layer of farmyard manure – which would have inhibited seed sowing!! So I made a large Vee in the manure, filled it with spent garden centre compost and sowed the carrot seeds in it (in March). The seed had been collected by myself from carrots left for a second year to set seed. Even though I covered the row with fleece not a single seed germinated owing to the extremely cold weather. I re-sowed in May but germination was poor owing to very cold weather. The summer was one of the hottest and driest on record. I did not water. Nevertheless, the carrots which did germinate grew to a very large size. The slugs, instead of attacking the tops of the carrots attacked the bottoms – possibly a consequence of growing the carrots in spent compost. In the gaps I transplanted young beetroot of a type which grows under the ground. The results for the beetroot were amazing – some between 8 and 10 pounds. Carrots and beetroot really love my no-dig soil!

YEAR 4 – 2007. Germination under fleece in March was good. I kept the fleece on until mid-June. April was very hot and dry and we had a huge amount of rain in June and July. I was not around at the appropriate time for thinning but that did not matter; the enormous carrots simply elbowed each other apart. The heaviest weighed 3 pounds 0.9 ounces. Many carrots were forked, owing to the very rich soil, but since each of the forked roots was larger than a normal carrot that did not matter. An unusual problem was that several carrots had "canker", similar to parsnip canker. I had never had that problem before – nor since, so it did not persist in the soil. The canker may have been a consequence of the unusual weather. Some other vegetables that year were huge – a turnip at 2 pounds 7 ounces, an outdoor cucumber at 6 pounds, a Swede at 3 pounds 7 ounces and a parsnip at 2 pounds 9 ounces – so the weather that year was very good for vegetables.

YEAR 5 – 2008. The weather was awful. I sowed under fleece in March as usual and not a single seed germinated. I re-sowed in May, germination was good and I decided to keep the fleece on for most of the growing season to keep the dreaded carrot fly at bay. It did not work! I had imprisoned emerging carrot flies under the fleece and they welcomed the environment and laid their eggs amongst my carrots. The carrot fly damage was massive. So that was a drawback to growing carrots in the same soil, year after year, with fleece over. The carrots were very good, with tops up to 30 inches, despite being grown under fleece. (I simply drape the fleece over the carrots and hold it down with bricks.)

YEAR 6 – 2009. Disaster. Zero germination in the trial row yet good germination in the control row. Both rows were from the same packet of seed, sown on the same day, under fleece. The carrots in the control row grew very well and the fleece was kept on until cropping. I had zero carrot fly damage and one top measured 34 inches. Clearly, something in the soil of the trial row must have inhibited germination. The Good Gardeners' Association arranged for a qualitative test of the soil microbiology in both rows. The trial row had bacteria 7000 against 6000 in the control row. The trial row had 15% fungi against 0% in the control row. Both rows had zero protozoa and nematodes. Those differences did not appear to give a clue as to the zero germination.

YEAR 7 – 2010. From a March sowing germination in both rows was good, with just a few gaps. Therefore, whatever it was in the soil which had inhibited germination in the trial row in year 6 had gone away. Strange. I was then asked by the Good Gardeners' Association to try out an aerobic compost tea on half of each row, which they supplied and I applied in early April. Thus I had four half-rows as follows:

A - trial row without tea
B - trial row with tea
C - control row without tea
D - control row with tea.

2010 was hot and dry from the beginning of May until the end of July. Because of the fleece I did not see that a great number of the immature carrots had died because of lack of water. For half-row D the length of fleece was about 8 feet short, so I had about 8 feet of carrots in that half row (the rest, under fleece, died). The other half rows were not too badly affected by the drought, but the final crop size was down on normal since the carrots did not get going until the end of July (at which point I thinned them to 2 inch spacing). The great surprise was the size of the carrots in trial row with tea B, which were enormous and much bigger than those in the trial row without tea A. It must have been the tea, which was supposed to have

been aerobic but may have been anaerobic because of a brewing error. Is anaerobic tea a growth stimulant?

YEAR 8 – 2011. As in 2006, it was time for the trial row to receive 3 inches of farmyard manure, so I made a large Vee in the manure, filled it with spent garden centre compost, and in March sowed the carrot seed in it. I treated the adjacent row, the control row, exactly the same except that half the control row had the same seed as the trial row and the other half had seed for yellow carrots. I put fleece over both rows. We then had the hottest and driest period on record from March to July. Germination in the control row was good but growth was inhibited owing to the lack of rain. Germination in the trial row was poor – about 25%. Nevertheless, carrots in the trial row were very big, the largest weighing 3 pounds 12.4 ounces (washed, no tops). In the control row, the largest yellow carrot weighed 3 pounds 11.1 ounces and the tops measured 35 inches, so growing under fleece with bricks holding down the fleece did not inhibit growth. It was a year for very large vegetables generally, despite the unusual weather. The edible part of a red cabbage weighed 6 pounds 2.7 ounces and a white cabbage 10 pounds 6.8 ounces.

CONCLUSION

After 8 years of the trial, growing the same variety of carrots in the same soil year after year, there was no sign of disease. The size of the carrots was truly remarkable, even though many were forked owing to the very rich soil. Slugs and carrot flies were problems, as was the splitting of many carrots because of their enormous size. However, there were definitely difficulties in getting the seed to germinate in the trial row, especially in years 6 and 8, when germination in the control row was good. The cause of poor germination must be because the carrots were sown in the same soil year after year, but the mechanism for inhibiting germination is not known. On the whole the trial rows were very worthwhile because of the enormous size of the carrots – which were tender right to the core.

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