

Increased Brix – Norfolk Soil and Crop Improvement Association Three Year Asparagus Trial

Overview

Boreal (SRC) was involved in a three-year trial with the Norfolk Soil and Crop Improvement Association. The trial was on a new asparagus plantation. The plot was set up in alternating 32-foot strips covering 9 acres. The application rate was 1300 lbs/acre per year for a total of 3900 lbs/acre. The control plot was fertilized with 150lbs Nitrogen, 60 lbs Phosphate and 175 lbs Potash per acre. The SRC plot received no additional soil amendments.

The Norfolk sand plain is a coarse well-drained soil subject to acidification. The heavy use of fertilizer and excessive cultivation has accelerated soil aging resulting in soil metal toxicities, particularly aluminum. Crop monitoring performed by A&L Laboratories in this region confirmed this problem.

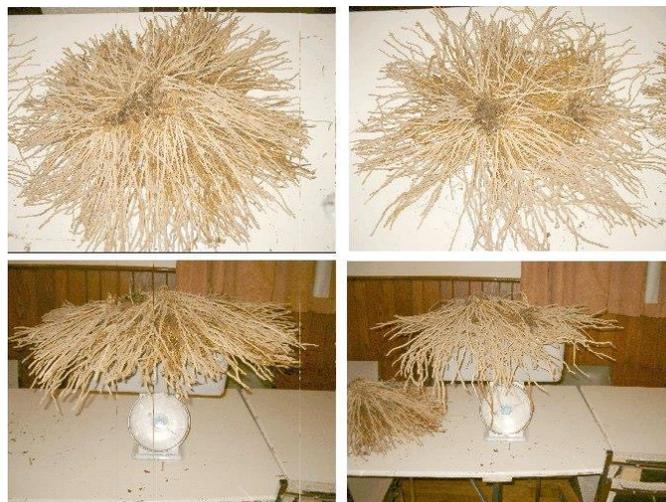
June 24, 2004 - Forth Year - First Full Harvest

Root development was evaluated before harvesting commenced. The results showed a very significant difference in plant development over the four year test period. The SRC plot root mass and spear numbers were double that of the control plots.

Asparagus harvesting continues until brix levels drop between 7 and 8%. If brix is allowed to drop below this level there will not be enough energy in root systems to produce fern for the following year's crop. The control strips as of June 24th measured between 7 and 8%. The Spanish River Carbonatite (SRC) plots brix readings all averaged between 12 and 13%. This meant that harvesting could have continued from the SRC plots while the control plots had to stop.

The yield calculation for the control plots was 5242 lbs. The final production on the SRC plots was 5832 lbs per acre for a 10% gain in productivity. If harvesting was to continue based on brix levels continued production from the SRC would have resulted in a much higher final yield.

Root Mass Observations



Spanish River Carbonatite Plot

Inputs: 1300 lbs/acre SRC

Weight was 17.5 lbs

Comments: root mass produced 64 spears

Control Plot

Inputs: 150 lbs/acre Nitrogen

60 lbs/acre Phosphate

175 lbs/acre Potash

Weight was 10.0 lbs

Comments – root mass produced 30 spears

The results of the three asparagus trial showed the following results:

- Spanish River Carbonatite outperformed chemical fertilizer.
- Higher brix indicating higher nutrient value.
- Increased plant vigor;
 - Larger root mass.
 - Greater spear production.
- Higher yields

Improvements to soil quality were not evaluated but based on mineral constituents of SRC; reactive calcite, apatite, biotite and trace elements, positive soil development would occur, particularly the elimination of aluminum toxicity typical of the Norfolk sand plain.

Date	1 - 10 C	11 - 20 T	21 - 30 C	31 - 40 T	41 - 50 C	51 - 55 C	56 - 60 T	61 - 65 T	66 - 70 C	71 - 75 C	76 - 80 T	81 - 85 T	86 - 90 C
May 8, 2004	1.5	2	1.5	2	1.5	2.5	2	2	1.5	1.5	2	2	1.5
May 11, 2004	4	4	3	4	4	12	13	13	18	14	15	15	14
May 12, 2004	5	6	5	5	5	8	8	15	15	8	8	13	10
May 13, 2004	7	6	6	6	6	16	15	16	15	14	15	16	14
May 14, 2004	6	6	6	5	5	16	14	15	13	10	12	12	10
May 15, 2004	4	4	4	3	4	10	10	9	4	3	6	4	4
May 18, 2004	6	6	6	6	6	18	19	19	19	19	20	20	18
May 19, 2004	4	3	3	3	3	10	9	10	9	8	12	12	10
May 21, 2004	6	5	5	6	6	17	15	15	14	12	14	14	12
May 22, 2004	3	3	3	3	3	10	8	4	4	8	6	5	8
May 24, 2004	4	4	4	4	4	6	6	12	11	10	10	12	10
May 26, 2004	3	3	3	3	3	4	5	9	4	4	9	7	5
May 28, 2004	3	3	3	3	3	9	8	5	4	8	8	7	6
May 29, 2004	2	3	2	2	3	6	6	6	5	5	6	6	5
May 31, 2004	4	3	4	3	4	11	10	6	5	5	7	7	5
June 1, 2004	1	2	2	2	1	5	5	6	6	5	5	6	5
Totals	63.5	63.0	60.5	60.0	61.5	160.5	153.0	162.0	147.5	134.5	155.0	158.0	137.5
June 3, 2004	1	2	2	2	2	5	6	6	5	5	6	6	5
June 4, 2004	2	3	2	3	2	2	6	6	4	4	6	6	4
June 5, 2004	1	1	1	2	1	2	4	4	4	4	5	5	4
June 7, 2004	3	3	3	4	3	4	5	5	4	4	5	5	4
June 8, 2004	2	2	2	2	2	3	3	3	3	4	4	4	4
June 9, 2004	3	3	2.5	3	2.5	4	4.5	4.5	3.5	3.5	4	4	3
June 10, 2004	2	2	2	2	2	3	2	2	2	2	2	2	2
June 12, 2004	1.5	1.5	1.5	1.5	1.5	2.5	2	2.5	2.5	2.5	2.5	2.5	2.5
June 14, 2004	4	4	3	3.5	3.5	5.5	5	5	5	5	5	5	4
June 15, 2004	2	2.5	2	2	2	3	3	3.5	3	3	3	3	2.5
June 16, 2004	2	2	2	2	2	3	2.5	2	2.5	2	2	2.5	2.5
Totals	23.5	26	23	27	23.5	37	43	43.5	38.5	39	44.5	45	37.5
Cumulative Total	87	89	83.5	87	85	197.5	196	205.5	186	173.5	199.5	203	175
June 17, 2004	2	1.5	1.5	1.5	1.5	2.5	2	2	2.5	2	2.5	2	2
June 18, 2004	1.5	1.5	1.5	1.5	1.5	2.5	2	2	2	2	2	2.5	2
June 19, 2004	1.5	1.5	1.5	1.5	1.5	2	2.5	2.5	2	2	2	2.5	2
June 21, 2004	2	2	1.5	1.5	1.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Totals	7	6.5	6	6	6	9.5	9	9	9	8.5	9	9.5	8.5
Cumulative Total	94	95.5	89.5	93	91	207	205	214.5	195	182	208.5	212.5	183.5
Total (lbs)	2350	2387.5	2237.5	2325	2275	5175	5125	5362.5	4875	4550	5212.5	5312.5	4587.5
lbs/acre	4351.8	4421.2	4143.5	4305.5	4212.9	6468.7	6406.2	6703.1	6093.7	5687.5	6515.6	6640.6	5734.3

Overall Average	5514	lbs/acre
SRC Test Plot	5832	lbs/acre
Control Plot	5242	lbs/acre