Kanzi appels

坎兹苹果

Gelderland, 2013

海尔德兰省，2013

The entrepreneur has a conventional cultivation. His focus with the trial was to see if he could get the crops healthier and more resilient

坎兹苹果是一种传统的商业品种，本试验的目的是探讨 Immutines™ 的应用是否能够提高该苹果的健康水平以及果实的坚韧度。

Due to intensive spraying with pesticides it was decided not to use Immutines™ as a foliar fertilizer, but adding it to the irrigation water.

由于需要对果树喷洒大量的杀虫剂，我们并没有采用 Immutines™ 叶面追加法，而是将 Immutines™ 追加到灌溉水中，进行试验。

Amount: 25 ltr/ha, divided over the entire growth season.

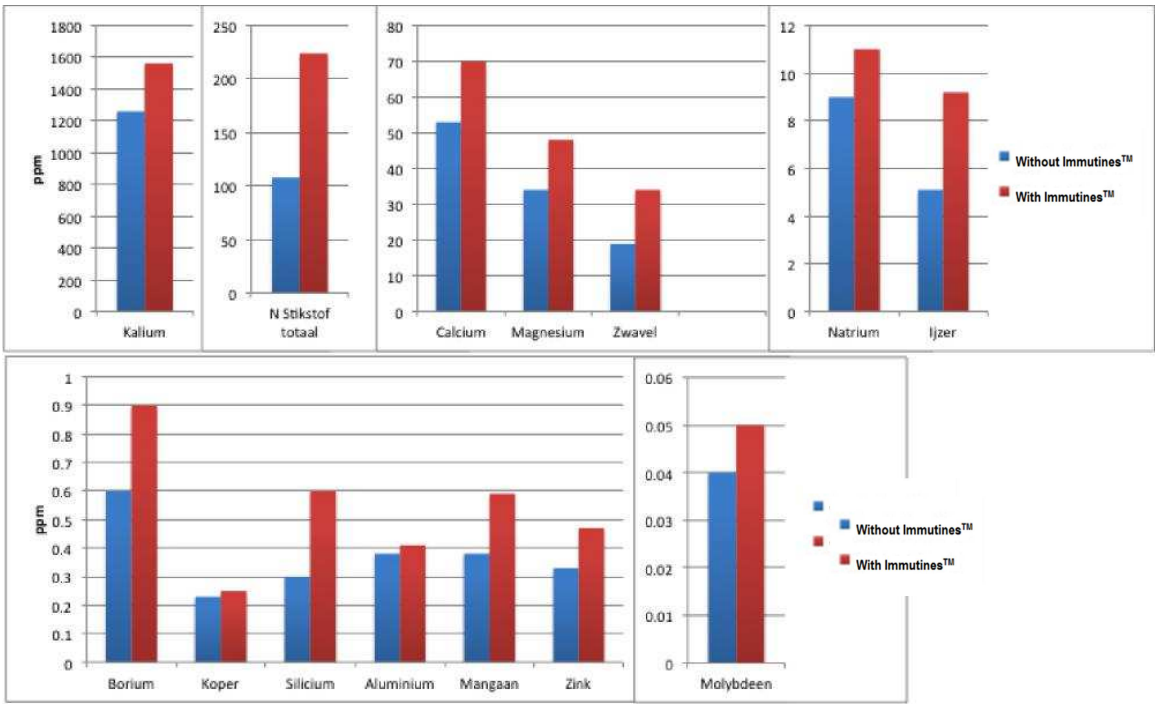
总用量：25 升/公顷，分批追加于一个生产季。

Results:

- Much more minerals in the apples. This is analyzed several times, both in the juice as well as in the dry matter. See the graphs and certificates of analysis certificates on the following pages.
- Brix values: approximately 10% higher
- Redox and pH show a lower degree of oxidation which results in a better shelf life.

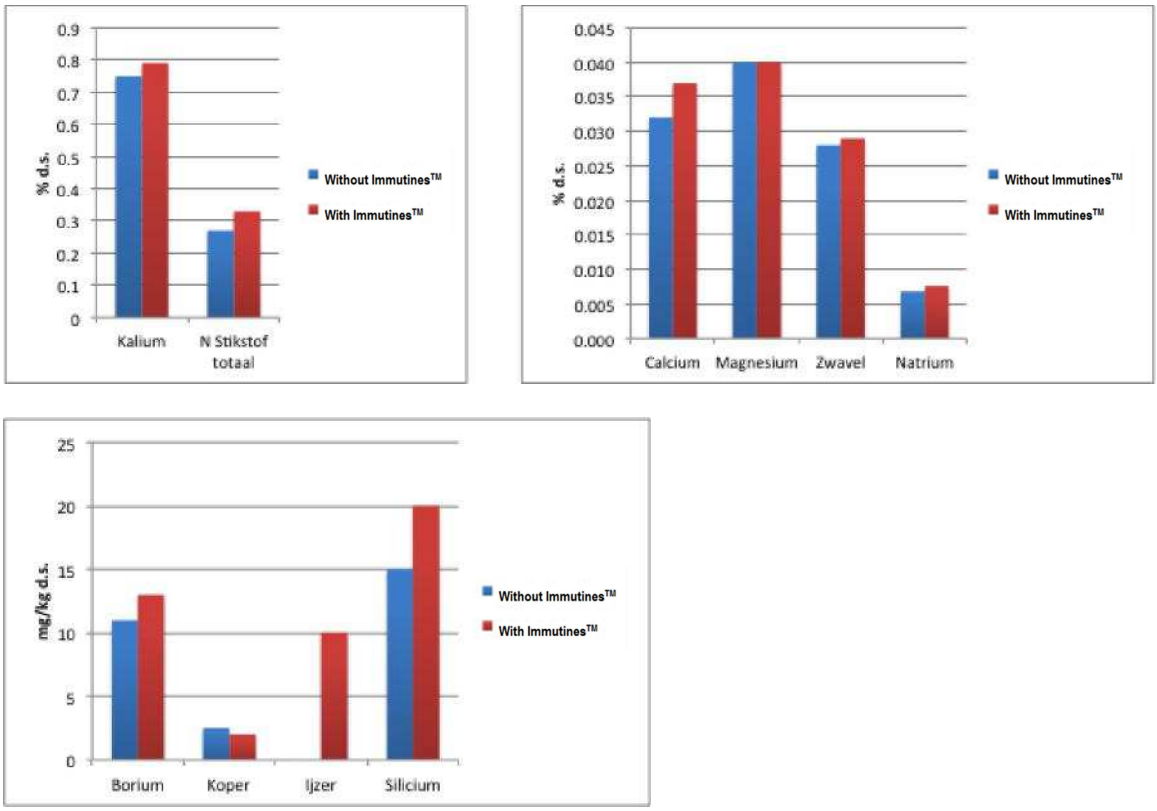
试验结果：

- 对果汁及干物质样品进行多次采样分析，苹果中的矿物质含量明显提高， 详见以下图表；
- 苹果中的可溶性固形物含量提高了约 10%；
- 氧化还原反应及 pH 值实验表明，产品的抗氧化能力提高，产品有更好的货架期。



Minerals in Kanzi appels just harvested (from Nova Crop Control)

采摘时坎兹苹果中的矿物质含量比较（来源于 Nova Crop Control）



Minerals in Kanzi appels ten weeks after harvested (from Zeeuws/Vlaanderen)

贮藏 10 周后坎兹苹果中的矿物质含量比较(来源于 Zeeuws/Vlaanderen)

Analysis data from NovaCropControl(02-10-2013)

NovaCropControl 分析数据(02-10-2013)

指标(item)	**单位(unit)**	**含量(amount)**	**备注(remarks)**
糖 (sugar)	%	14.8	
pH		3.1	
电导率 (EC)	ms/cm	2.9	
钾(K)	ppm	1560	
钙(Ca)	ppm	70	
钾/钙 (K/Ca)		22.29	
镁(Mg)	ppm	48	
钠(Na)	ppm	11	
铵盐(NH4)	ppm	14	
硝酸盐(NO3)	ppm	94	
硝酸盐中的氮 (N from NO3)	ppm	21	
总氮量(Total N)	ppm	224	
氯(Cl)	ppm	17	
硫(S)	ppm	34	
磷(P)	ppm	74	
硅(Si)	ppm	0.6	
铁(Fe)	ppm	9.20	
锰(Mn)	ppm	0.59	
锌(Zn)	ppm	0.47	
硼(B)	ppm	0.90	
铜(Cu)	ppm	0.25	
钼(Mo)	ppm	0.05	
铝(Al)	ppm	0.41	

Analysis data from ZEEUWS-VLAANDEREN(27-12-2013, control without Immutines)

ZEEUWS-VLAANDEREN 分析数据(27-12-2013, 无 Immutines 处理的对照组)

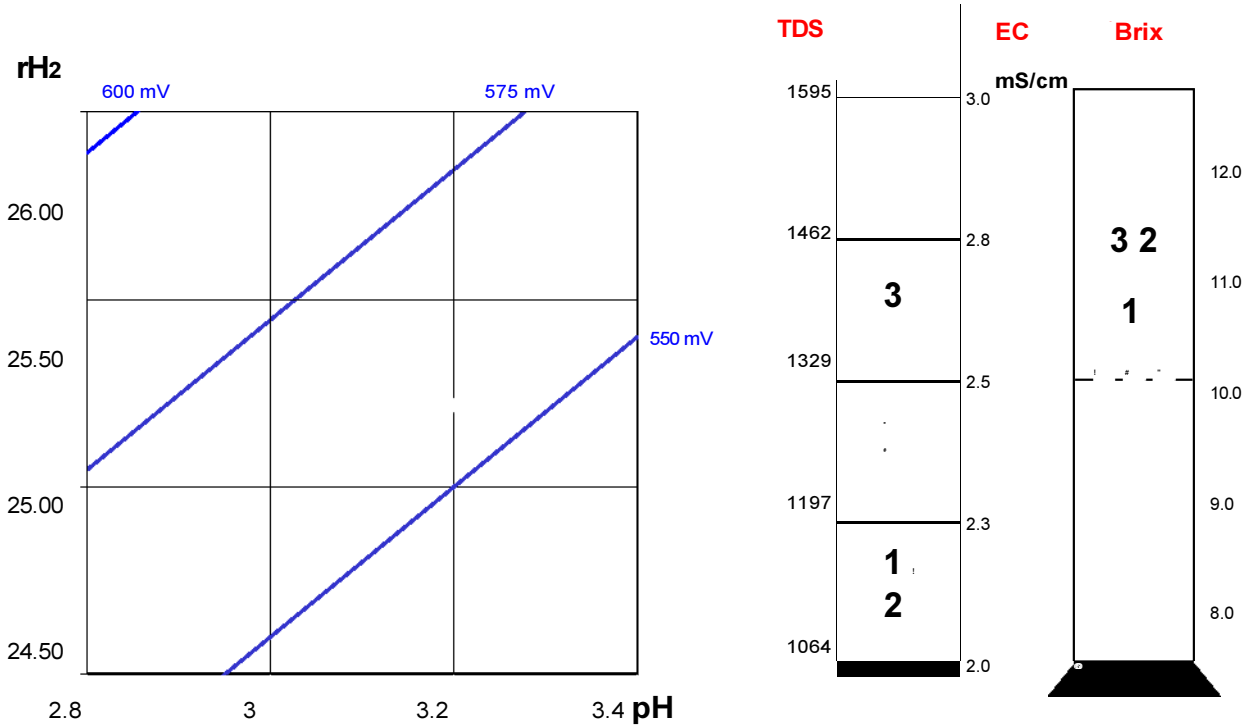
指标(item)	单位(unit)	含量(amount)	备注(remarks)
干物质(day matter)	% d.s.	14.5	d.s.=dry matter, the same below
钙(Ca)	% d.s.	0.032	
钾(K)	% d.s.	0.75	
镁(Mg)	% d.s.	0.04	
硫(S)	% d.s.	0.028	
铝(Al)	mg/kg d.s.	<27	
硼(B)	mg/kg d.s.	11	
铜(Cu)	mg/kg d.s.	2.5	
铁(Fe)	mg/kg d.s.	<9	
锰(Mn)	mg/kg d.s.	<5	
钼(Mo)	mg/kg d.s.	<0.18	
硅(Si)	mg/kg d.s.	15	
锌(Zn)	mg/kg d.s.	<5	
钠(Na)	mg/kg d.s.	68	
硼(B)	mg/1000g p	1.6	P=raw Product, the same below
钙(Ca)	mg/100g P	4.6	
钾(K)	mg/100g P	111.3	
铜(Cu)	mg/kg P	0.4	
镁(Mg)	mg/100g P	5.8	
锰(Mn)	mg/kg P	<0.9	
钼(Mo)	mg/kg P	<0.1	
钠(Na)	mg/kg P	10.4	
硅(Si)	mg/kg P	2.5	
铁(Fe)	mg/kg P	<1.8	
锌(Zn)	mg/kg P	<0.9	
硫(S)	mg/100g P	4.6	
铝(Al)	mg/kg P	<6.0	
氮(N)	% d.s.	0.27	d.s.=dry matter, the same below
磷(P)	% d.s.	0.06	
氮(N)	mg/100g P	40.5	P=raw Product, the same below
磷(P)	mg/100g P	8.7	

Analysis data from ZEEUWS-VLAANDEREN (27-12-2013, with Immutines)

ZEEUWS-VLAANDEREN 分析数据(27-12-2013, Immutines 处理组)

指标(item)	单位(unit)	含量(amount)	备注(remarks)
干物质(day matter)	% d.s.	14.0	d.s.=dry matter, the same below
钙(Ca)	% d.s.	0.037	
钾(K)	% d.s.	0.79	
镁(Mg)	% d.s.	0.04	
硫(S)	% d.s.	0.029	
铝(Al)	mg/kg d.s.	<27	
硼(B)	mg/kg d.s.	13	
铜(Cu)	mg/kg d.s.	10	
铁(Fe)	mg/kg d.s.	2.0	
锰(Mn)	mg/kg d.s.	<5	
钼(Mo)	mg/kg d.s.	<0.18	
硅(Si)	mg/kg d.s.	20	
锌(Zn)	mg/kg d.s.	<5	
钠(Na)	mg/kg d.s.	76	
硼(B)	mg/1000g p	1.8	P=raw Product, the same below
钙(Ca)	mg/100g P	5.5	
钾(K)	mg/100g P	114.6	
铜(Cu)	mg/kg P	<0.4	
镁(Mg)	mg/100g P	5.6	
锰(Mn)	mg/kg P	<0.9	
钼(Mo)	mg/kg P	<0.1	
钠(Na)	mg/kg P	10.9	
硅(Si)	mg/kg P	2.9	
铁(Fe)	mg/kg P	<1.8	
锌(Zn)	mg/kg P	<0.9	
硫(S)	mg/100g P	4.2	
铝(Al)	mg/kg P	<6.0	
氮(N)	% d.s.	0.33	d.s.=dry matter, the same below
磷(P)	% d.s.	0.06	
氮(N)	mg/100g P	48.9	P=raw Product, the same below
磷(P)	mg/100g P	9.8	

Jan-Willem Berben



Comparison of indicators between Kanzi apple with sea-crop and control apple

坎兹苹果相关指标对照实验的测定结果

编号 NO.	对象 item	pH	Eh mV H	rH2	EC ms/cm	R Ω/cm	TDS mg/l	P μW	Brix
1	坎兹苹果 sea-crop	3.19	557	25.2	2.17	461	1,154	673.2	10.5
2	坎兹苹果 sea-crop	3.05	554	24.8	2.11	474	1,122	647.6	11.0
3	坎兹苹果 sea-crop	3.04	555	24.8	2.62	382	1,393	807.0	11.0
4	坎兹苹果对照组（control）	3.08	578	25.7	2.16	463	1,149	721.6	10.0
5	坎兹苹果对照组（control）	3.09	566	25.3	2.43	412	1,292	778.5	10.0
6	坎兹苹果对照组（control）	3.09	577	25.7	2.37	422	1,260	789.0	10.0

Sample data

样品信息

The samples are taken and measured on October 1, 2013.

送样及测定指标时间为 2013 年 10 月 1 日。

Remarks

建议及评论

Eris also looked at the sample if it was possible to determine the number of apples to count. The trees yield. This proved to be due to the large variation between trees possible. As a result, it was not possible to take that is large enough to get a representative picture.

不同果树间，果实的数量和产量有别，因此，理论上不太可能大规模取样，得到非常具有代表性的样品。

Notes on the charts

图例说明

In the left graph, the horizontal axis is the acidity (pH) and plotted on the vertical axis represents the degree of oxidation (rH 2). The degree of oxidation is calculated from the pH and the redox potential. The redox potential is shown in the figure, with the oblique lines. Fruits and vegetables are generally longer tenable as the redox potential is lower.

上述图中，左边那张图的横坐标代表 pH 值，纵坐标为氧化水平。果实氧化能力由果实酸度 pH 及氧化还原能力表征，果蔬的氧化还原水平越低，其抗氧化能力越强，果实就更易贮藏，货架期就会更长。

The middle graph is the conductivity (EC) is displayed. This is a measure of the amount of dissolved salts (minerals) in a sample. It is expressed in mS / cm. In addition to these standard quantity is an approximation given for the amount of substance being solved with which it corresponds (TDS).

中间那张图表征了果实电导率的变化情况。

In the right graph, it is the Brix value. The number of degrees brix indicates the angle at which light makes when it breaks on the edge of the liquid. This value increases with devolution sugars, minerals and proteins in the plant sap.

右面那张图表征了果实中可溶性固形物含量的变化情况。

Interpretation

解释说明

The redox potential of the treated with Sea-Crop apples is lower than the redox potential of the apples that have not been treated. Sea-Crop treated apples should be longer and storable. We have the following measurements also discussed that the apples are stored separately, so that we can see whether this produces noticeable differences in practice.

经过 Sea-Crop 处理过的苹果，其氧化还原水平低于对照组，这也表明了经过 Sea-Crop 处理后的苹果，其货架期更长。我们将在接下来的实验中探讨，在实际贮藏过程中，两组苹果产品的货架期是否有显著差别。

The levels of proteins and sugars (Brix) of all treated with Sea-Crop apples higher than in the untreated apples. The EC is too variable to be able to interpret them clearly. Generally you would expect that higher sugar levels are associated with lower EC, because the minerals are converted into more complex molecules. We see this part back, but not at number three with Sea-Crop. We would be doing more measurements to determine with certainty whether the nutrient uptake better balanced and more efficient utilization of nutrients.

经过 Sea-Crop 处理过的苹果，其可溶性固形物含量明显高于对照组，这也可以从两组产品的电导率差别可以得出。接下来，我们将进一步就营养素的平衡性及利用效率进行研究。