than plants in soil while plants under nutrient program A (with added Silicon in PP bags) produced more than plants grown in troughs treated with nutrients program B (without added Silicon).

Plants grown in hydroponics culture developed faster than plants in soil at all growing stages. The vegetative stage in the hydroponics culture was dramatically different from the soil grown plants in terms of stem length; plant overall size and timing of tubers initiation.
The plant density in the hydroponics culture of 18 plants per sq/m allowed higher production per square meter (23kg) than plants grown in soil in traditional potato cultivation (number of plants per sq/m grown in soil, yield, 4.0 – 5.5 kg/sq/m).

The overall production of tuber /sq.m depends on other factors than density per plants. The main factor though is the number of productive stems amongst others, therefore results may vary from variety to variety.

PRODUCTION ANALYSIS

TUBERS PRODUCTION BY NUMBER/Plant (Tubers per 9 plants, per plant)			
Variety	PP bags	Troughs	Soil
Ronaldo	183	160	81
p/plant	20.3	17.7	9
Sifra	82	66	61
p/plant	9.1	7.3	6.7
Mondial	106	88	80
p/plant	11.77	9.7	8.9
Total tubers weight per plant			
Variety	PP bags	Troughs	Soil
Ronaldo	1320g	625g	*967g*
Sifra	483g	412g	538g
Mondial	678g	660g	810g

AVERAGE WEIGHT PER TUBER

Variety	PP bags	Troughs	Soil
Ronaldo	65g	35.3g	107g
Sifra	53g	56.4g	80.3g
Mondial	57.6g	68.0g	91.0g

Tubers weight per sq/m: Ronaldo in PP bags perform 24% higher than Ronaldo in soil per sq/m. Mondial and Sifra perform better in soil than in PP bags or trough. Ronaldo in PP bags perform better than in a trough (suggested Silicon application).

COMPARISON OF RONALDO VARIETY PRODUCTION IN PP BAGS (HYDROPONICS) Vs SOIL

MAKETABLE SIZE / WEIGHT TUBERS							
		50/60g	60/70g	70/90g	90g>	50g<	TPP
Ronaldo	PP bags	8.2	6.4	1.7	2.7	1.3	20.3
Ronaldo	Soil	1.6	0	1	5	1.4	9

Ronaldo in PP bags produced 11.3 tubers more than in soil. Ronaldo in PP bags produced 8.2 marketable tubers Vs 1.6 in soil. (5 times more).

TUBERS WEIGHT PRODUCTION PER SQARE METER

Variety	PP bags	Troughs	Soil
Ronaldo	23.76kg	11.25kg	17.40kg
Sifra	8.694kg	7.416kg	9.684kg
Mondial	12.20kg	11.88kg	14.58kg

PP BAGS (POLYPROPYLENE)*

Polypropylene bags are bags made from the synthetic plastic polymer polypropylene, a frequently used material in consumer goods and some industrial applications. It is used for bags less commonly than polyethylene, another plastic polymer and the most frequently used material for disposable plastic bags and packaging but is superior to polyethylene for bags that are meant to be reused. Using the PP bags as “container” in which the plants roots and tubers develop in hydroponics culture has a significant effect on plant growth and development. It is suggested that being a porous layer underneath allow constant dynamics of water, nutrients and Oxygen (Horizontally and vertically) and kept the roots moist at all time. It is considerably inexpensive, easy to layout and does not deteriorate over time.

APPLICATION OF SILICON TO IMPROVE CROPS PRODUCTION*

Silicon effect on plant development and improve resistance to diseases is well researched. It is concluded that Silicic acid is the form of silicon in soils that is available to plants. [Si (OH)4] (or its ionized form, Si(OH)3O-, which predominates at pH > 9). The Silicon used in the experiment is a proprietary formula using nano technology developed by Agrisilis (www.agrisilis.com) containing a minimum of 25% SiO2 in the form of silicate ion Si(OH)3O-1 which can be applied easily as a part of the nutrient solution. By evaluating the results of potato tubers production grown under similar conditions and similar nutrients program, the plants supplemented with Agrisilis Silicon produced double numbers of tubers per square meter (23.76kg) as against tubers produced without supplemented Silicon (11.25kg). Plants developed longer and stronger stems in the Silicon supplemented PP bags than plants without Silicon supplement in the troughs (89cm (h) and 78cm (h) respectively). Interestingly, the number of tubers produced per square meter in soil was lower than the hydroponics tubers by only 27% which can be a result of Si presented in the soil. All data above relates to “Ronaldo” variety only. The other two varieties (Sifra & Mondial) have no significant differences in height or tubers per square meter.

SUMMARY OF EXPERIMENT

The results indicate that the development of Potato plants from tubers in hydroponics culture reduce the duration of cycle from planting to harvesting (77 days) in comparison to soil grown potatoes. The overall production in terms of marketable size and weight (50 – 60mm and 50 – 60g respectively) increased in the hydroponics culture in comparison to soil culture. In both cultures the growth and production pattern of the plant is variety dependent.

*** The tuber size of the potato “seeds” does influence the number of growing stems and therefore the number of tubers produced.

The larger the “seed” tuber the higher the production which is a fact, scientifically recorded and analysed in various experiments.

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After all, when the products you make were formed millions of years ago, then 50 years is only the beginning