Vigo for Agri review

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Bright AGRO Innovation

vigo FOR AGRI

Description of Vigo

- Vigo for Agri™ is a plant supplement which in itself is not a nutrient source but rather an optimiser/potentiator of other nutrient additives.
- Vigo for Agri™ has a physiological effect at the cell membrane level triggering nutrient and water movement thereby allowing the plant to maximise usage of available nutrients.
- Being water soluble, the product is easily absorbed through the roots or leaf stomata.
- The product can be applied at anytime within the plant's growth cycle – i.e. from seed to mature plant.
- Treated plants respond by producing more roots and healthier shoots over a shorter period of time as well as enhancing bud break, increasing flowering and therefore fruiting.
- Vigo for Agri™ functions similarly to other secondary metabolites in the regulation of primary metabolic pathways.

Germination and seedling development – Rice

Table 1. Effect of VIGO on the growth of rice seedlings under growth chamber conditions. The VIGO concentration was prepared by diluting 1 mL of stock solution with 500 mL of tap water for petri dish wetting. (n = 60 plants).

Treatments	Number of lateral roots	Root length (mm)	Coleoptile (mm)	Seedling mass (mg)	Seedling length	Vigour index	Seedling survival (%)
	Mean ±SE						
Control	4 b	34.5 b (0.76)	30.0 b (0.82)	54.3 b (0.29)		6450 b (115)	100
VIGO	26 a	53.3 a (0.67)	34.2 a (0.71)	60.9 a (0.64)		8750 a (104)	100

Values in the column with different letter(s) are significantly different at P ≤ 0.05 by least significant difference.

The treated seedlings had 6,5 X more roots than the control.
The roots are 1,5 X longer roots
The seedlings were 10% heavier than the control
Vigour was improved with factor 1,4

Germination and seedling development- corn

Table 1: Effect of VIGO on the growth of maize seedlings under laboratory conditions (7 days).

Treatments	Growth Parameters								
	Germination (%)	Root Length (mm)	Number of 2nd Roots	Number of Laterals	Root Weight (mg)	Shoot Length (mm)	Shoot Weight (mg)	Root / Shoot Ratio	Vigour Index
Control	78	26.5 b	4 b	5 b	84.2 b	18.7 b	103.7 b	0.83 b	3520 b
VIGO	91*	35.6 a	8 a	15 a	125.0 a	32.0 a	125.8 a	1.12 a	6152 a

Note - * Significantly different from other treatments within the column at $p \leq 0.05$ level (Chi-square test)

Values with the same letters within the columns do not differ from each other at a 5% level of significance

Germination was improved and also vigour was increased with a factor of 1,75
Longer roots were formed and root numbers increased between 2- 3X
Root weight was increased with a factor of 1,5
Shoot length increased with a factor 2 and the shoot weight was 1,2X more

Same corn plants after 90 days

Table 2: Effect of VIGO on growth of potted maize plants under greenhouse conditions (90 days).

Treatments	Growth parameters					
	Leaf stage	**Shoot height (mm)**	**Root weight (g)**	**Shoot weight (g)**	**Root / Shoot ratio**	**% survival of plants**
Control	4.4 ± 0.59 b	420.7 ± 59.8 b	4.30 ± 0.74 b	9.57 ± 1.55 b	0.39 ± 0.09 a	63*
VIGO	6.6 ± 0.42 a	663.7 ± 46.0 a	7.02 ± 0.76 a	17.6 ± 1.77 a	0.41 ± 0.05 a	89

Note - * Significantly different from other treatments within the column at $p \leq 0.05$ level (Chi-square test)

Values with the same letters within the columns do not differ from each other at a 5% level of significance

Plants that have enhanced growth parameters than the standard treatment

The survival rate from the standard treatment, compared to the ratings after 10 days, decreased by 20 %, while Vigo treated plants the survival rate was more than 97%

Germination and seedling development: beans & okra

Table 1. Influence of VIGO (1:500 dilution) on growth and vigour of two commercial crop plants. Seeds were incubated in the dark at 25°C for 6 days. Mean values with different letters within each of the growth parameter for each crop are significantly different ($P < 0.05$).

Crop	Treatment	Root length (mm)*	Shoot length (mm)*	Seedling mass (mg)*	Vigour Index
Okra	Control	3.99 ± 0.17 b	14.47 ± 0.53 b	99.3 ± 3.1 b	1606 b
	VIGO	9.93 ± 0.46 a	35.7 ± 1.33 a	153.0 ± 4.7 a	4152 a
Bean	Control	11.7 ± 0.61 b	5.25 ± 0.26 b	438.2 ± 13.8 a	1441 b
	VIGO	26.8 ± 1.28 a	6.05 ± 0.21 a	465.1 ± 13.2 a	3469 a

*Mean value ± SE

OKRA: Longer roots (2,5 X),taller plants (2,4 X) more biomass (1,5 X) and improved vigour (2,6 X)

BEAN: Longer roots (2,3 X),taller plants (1,2 X), more biomass (1,1 X) and improved vigour (2,4 X)

Germination and seedling devlopment

Crop/culture	Vigo (% germ)	Water (% germ)
Black beans	85	82
Broccoli	93	27
Onions	69	34
Peas	100	98
Radish	75	56
Wheat	80	46

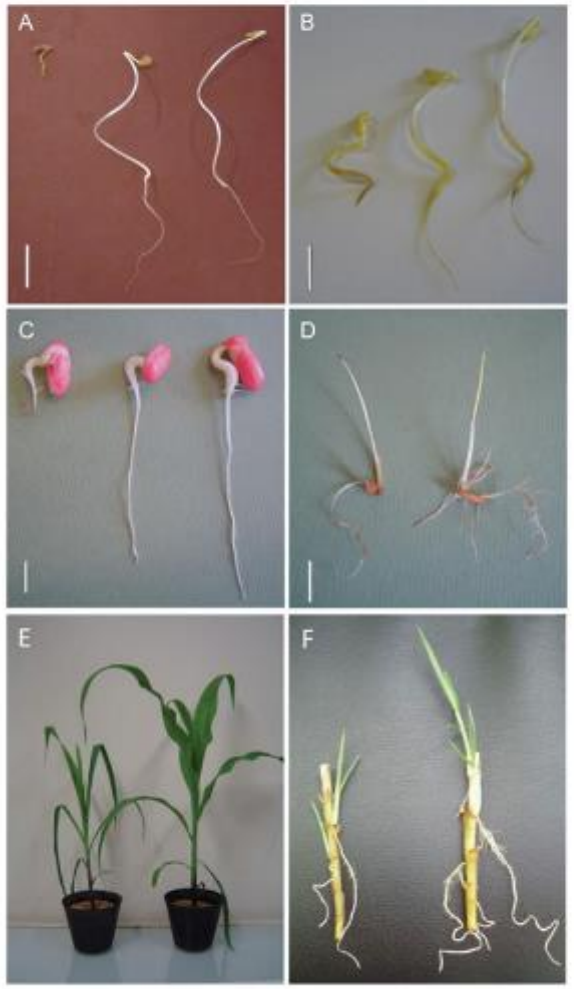
Germ rating after 4 days, Nov. 2014

Vigo concentration was 1:800 (1,25 ml Vigo/liter water)

Visual comparison of seedlings

Vigo for Agri™

treated seeds and plants



A - Tomato

B - Okra

C - Beans

D - Rice

E - Maize

F - Pasture Grass

Strawberries

trial summary

Three trial blocks comprising 4 hectares pe block.

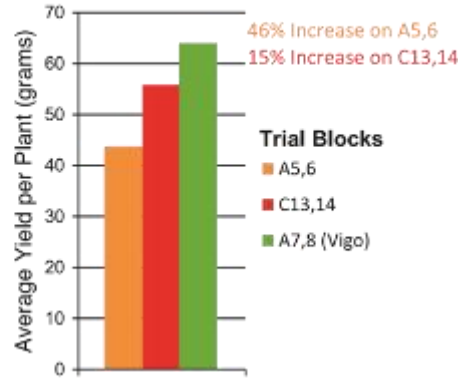
treatments:

- Two controls: A5,6 - untreated under shade-netting C13,14 - untreated in open field
- Both control blocks were exposed to the standard fertigation protocol used for commercial production.
- One Vigo™ treated block A7,8 under shade-netting exposed to a 30% reduction in the standard fertigation protocol.

All blocks are irrigated three times a week. Fertigation is applied with each irrigation cycle. Vigo™ is applied with two of the three, weekly irrigation applications.

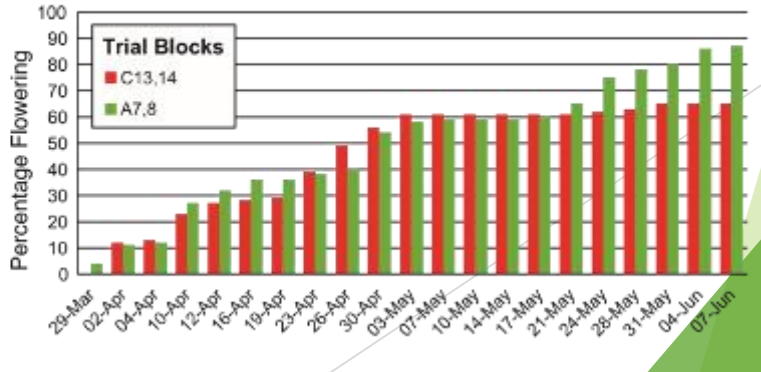
trial observations and results

Plants treated with Vigo™ responded more vigorously after transplanting compared to untreated plants. Plants produced significantly more flowers and yielded more fruit when treated with Vigo™.



Brix value went up from 8 to 9 with is very good for flavor !

The highest yield increase was in the beginning of the season (37%)



Tomato-1

Table 1. Effect of VIGO treatments on yield of 'Heinz-1370' tomato under greenhouse conditions. The VIGO concentrations were prepared by diluting 1 mL of stock solution with 500 or 2000 mL of tap water for soil drenching. The treatment pots were irrigated twice weekly with VIGO solution and once with water until they reached field capacity. The control pots were irrigated with water three times weekly (n = 15 plants).

Treatment[y]	Fruit (no./plant)	Total fruit (no.)	Mean fruit wt (g)[x]	Mean fruit diam (mm)[x]	Biomass (g/plant)	Biomass (g/plant)
	Mean ± SE					
Control	8.27 ± 0.80 b[v]	124 ± 0.80 b	72.8 ± 4.3	54.0 ± 0.7	780 ± 63	0.694 ± 0.7 b
(1:500 v/v)	11.2 ± 1.11 a	168 ± 1.11 a	67.3 ± 3.6	54.4 ± 0.6	976 ± 93	0.762 ± 0.8 a
(1:2000 v/v)	9.94 ± 0.96 ab	149 ± 0.96 ab	68.4 ± 2.5	53.3 ± 0.6	854 ± 81	0.733 ± 0.7 a

[z]1 mL = 0.0338 fl oz. [y]1 nM = 1 ppb. [x]1 g = 0.0353 oz; 1 mm = 0.0394 inch. [w]Ratio of fruit yield to total aboveground biomass yield on a fresh weight basis. [v]Values in the column with different letter(s) are significantly different at P ≤ 0.05 by least significant difference.

Higher concentration of Vigo leads to improved performance (1:500)
Total fruit and number fruit/ plant increased with factor 1,3 (1:500)
Biomass was enchanced with a factor of 1,3 (1:500)
Harvest Index (amount of fruit to leaves and stems) was 10% higher than the standard treatment

Tomato-2

Table 2. Effect of VIGO treatments on nutritional composition of 'Heinz-1370' tomato fruit that were allowed to ripen at room temperature. VIGO concentrations were prepared by diluting 1 mL of stock solution with 500 or 2000 mL of tap water for soil drenching. The treatment pots were irrigated twice weekly with VIGO and once with water until they reached field capacity. The control pots were irrigated with water three times weekly (n = 15 plants). Five fully ripe tomatoes at five different harvests were used and the estimation procedure was repeated five times. Mean values are with ±SE.

Treatment[y]	Ascorbic acid (mg/100 g)[x]	b-Carotene (mg/100 g)	Lycopene (mg/100 g)	Total soluble solids (%)	pH
	Mean ± SE				
Control	57.1 ± 7.1	6.77 ± 1.4	30.7 ± 5.9	5.7 ± 0.09	4.0
(1:500 v/v)	87.4 ± 8.5	7.27 ± 0.3	29.8 ± 2.0	5.6 ± 0.15	4.0
(1:2000 v/v)	75.0 ± 16.0	6.56 ± 1.3	29.7 ± 7.8	5.4 ± 0.09	4.0

[z]1 mL = 0.0338 fl oz.
[y]1 nM = 1 ppb.
[x]1 mg/100 g = 10 ppm.

Substances which benefit health improved with Vigo apllication

Ascorbic acid (vit.C) increased with a factor of 1,5
B- Carotene (vit. A) increased with a factor of 1,1

Expect that vit. E levels and brix will also increase

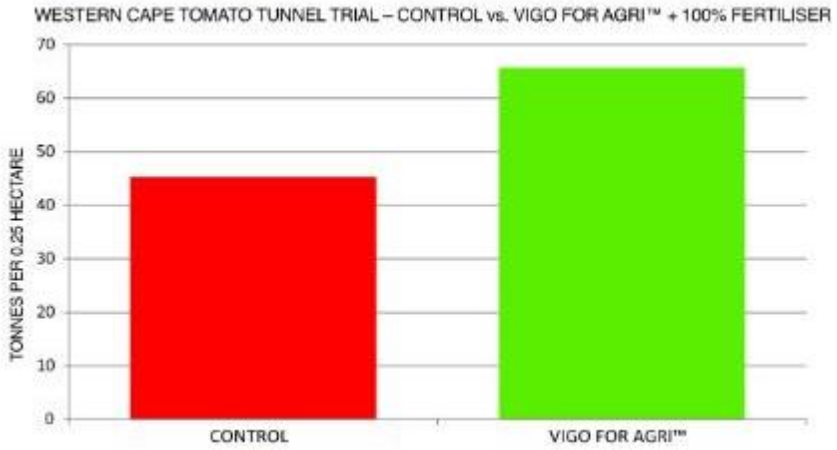
Tomato-3

Amounts and types of fertilizers used during the trial on each of the plots:
8 Liters of CaNO3 per day and 12 liters of mengsel per week (Stikstoffosfaat, Kalium, Magnesium, Spoorelemente and Koolstof)

Yield of treated and untreated plots:
0,25 Hectare plot treated with Vigo = 65,7 tons
The 3 control plots totalling 0,75 Hectares = 135,843 Tons with the average production of tomatoes per 0.25 Hectare plot yielding 45,281 Tons

Other beneficially notable difference between the plot treated with Vigo and the control plots:
The plot treated with Vigo gave a 2 week longer harvest and the growth was more vigorous than the untreated plots.

A.E. BOTHA



Tomato-4 (ZZ2)

trial summary

To determine the effects of Vigo™ on the yield of tomatoes. A pot and field trial were conducted at ZZ2 Farm in Mooketsi, South Africa. Four week old seedlings (ZZX23 variety) were planted into five litre pots and in open fields. Agronomic management practices followed ZZ2 standard procedure.

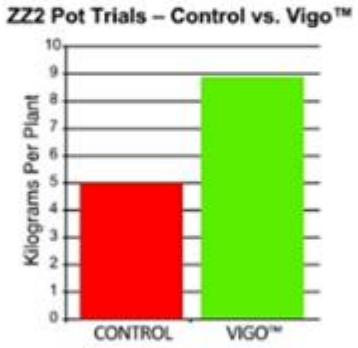
treatments:

- Control - exposed to the standard fertigation protocol used for commercial production.
- Vigo™ – treatment applied twice weekly, from transplant to end of harvest. Plants were exposed to a 50% reduction in the standard fertigation protocol.

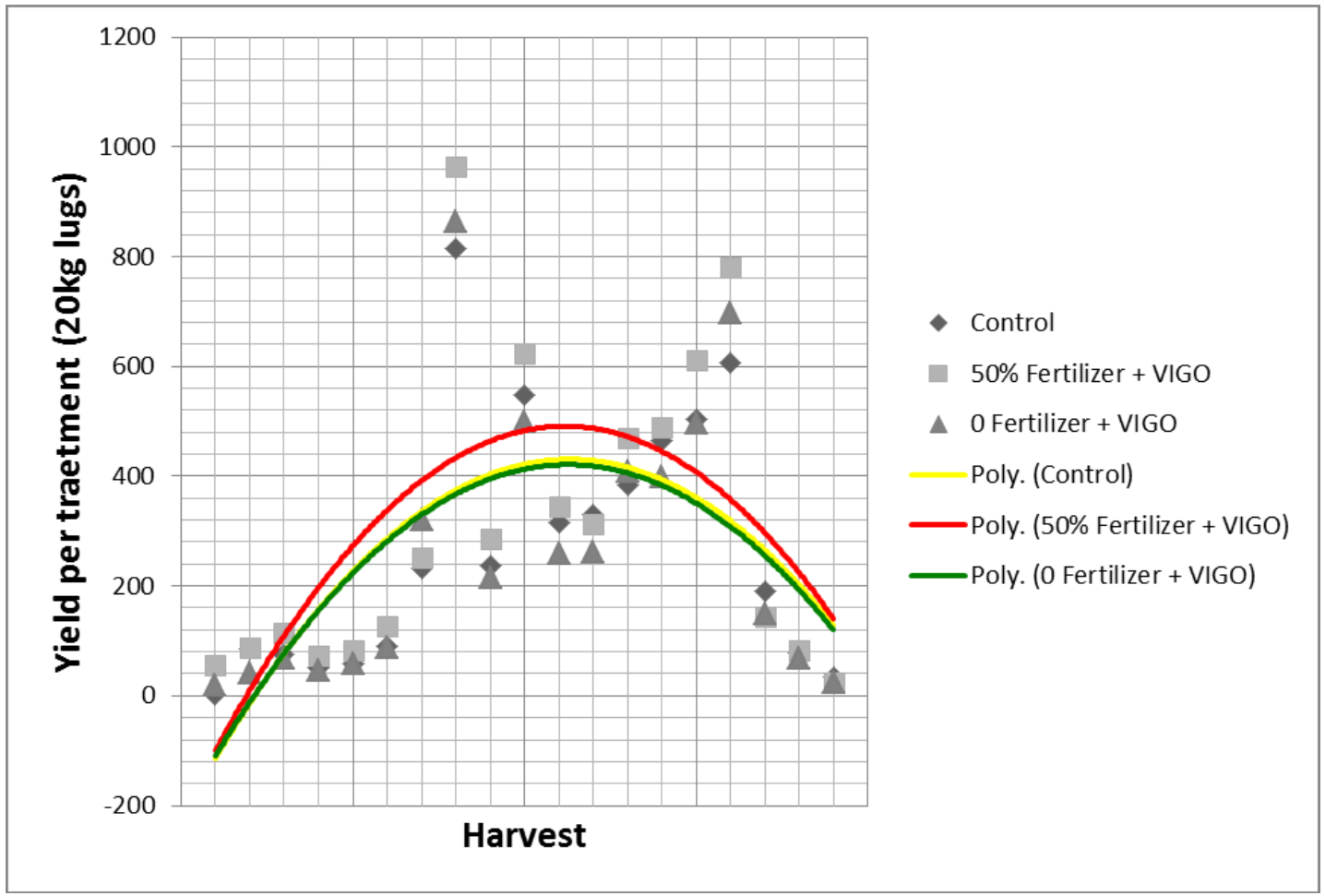
Pot Trial: 3 plants x 5 replications = 15 plants/treatment.
Field Trial: 0.7 Hectare blocks = 8000 plants/treatment.

trial observations and results

Plants treated with Vigo™ responded more vigorously after transplanting compared to untreated plants. Plants produced significantly more fruit and an increase in yield weight when treated with Vigo™.



Tomato-5: Fertilizer effect



Best result from ZZ2 field trials was obtained with 50 % of usual fertilizer application & Vigo

Bell Peppers

trial summary

To determine the effects of Vigo™ on the yield of sweet peppers. The cultivar used is Capistrano. The trial was conducted at LARSS Experimental Farm, Nelspruit, South Africa.

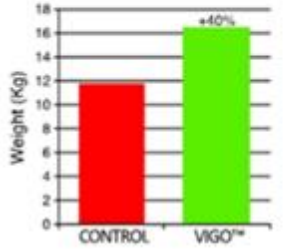
treatments:

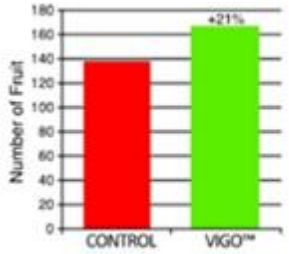
- Control – exposed to the industry standard growing protocol used for commercial production.
- Vigo™ – treatment applied twice a week, from transplant to end of harvest.

Plot size: 8 plants x 4 replications = 32 plants / treatment.

trial observations and results

Plants treated with Vigo™ responded more vigorously after transplanting compared to untreated plants. Plants produced significantly more fruit and an increase in yield weight when treated with Vigo™.





Bulbs

trial summary

To determine the effects of Vigo™ on the growth of floral bulbs. Two week old seedlings of an Albuca cultivar were used in the trial.

treatments:

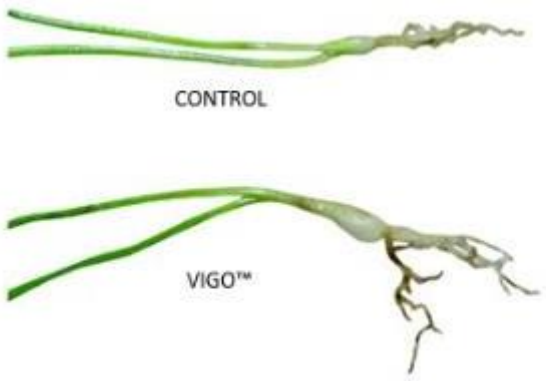
- Control – water.
- Vigo™ – treated at a dilution of 1:4000.

Plot size: 10 plants x 3 replications = 30 plants / treatment.

The trial period was conducted for 3 months, after which bulb sizes and weights were measured and compared.

trial observations and results

Plants treated with Vigo™ responded more vigorously, significantly increasing bulb size and weight when compared to untreated plants.



Turf

Vigo for Agri is a biostimulant and nutrient optimiser/catalyst

It maximises the turf's uptake of nutrients allowing for the more efficient use of fertilizer/nutrients resulting in significant cost savings. (+20%)

It enhances environmental sustainability by minimising/dissipating thatch build up on golf course greens and allows for greater percolation of water through to the root zone. This results in the reduction of water and fertilizer runoff reducing enviro –degradation of surrounding ground and waterways.

Vigo for Agri produces deep healthy rooting over a shorter period of time.

Turf

“I did see a great improvement in leaching out of greens thatching with no detrimental effects on the grass or damage to the playing surface.” – (Feedback: Golf Course Superintendent after applying Vigo for Agri)

Without VIGO – Soil profile of golf course green after six months with a pronounced hydrophobic 10 mm thatch layer. (Control)

With VIGO – Soil profile of treated area after six months showing a narrow diffusing 3 mm thatch layer.

Summary

Vigo for Agri™

the spectrum of crop species

Fruit Trees

Treatment with Vigo for Agri™ can assist in bud breaking, increased flowering and fruit yield. Application is done prior to budding through the growing season.

Cereal Grains

Treatment with Vigo for Agri™ results in vigorous growth, improved root and shoot development, and an increases in seed production.

Nuts

These include hazelnuts, chestnuts, almonds and other "true nuts" together with ground nuts. Treatment with Vigo for Agri™ results in an increase in yield.

Grasses / Bamboo

Treatment with Vigo for Agri™ enhances rooting and shooting accelerating growth.

the spectrum of crop species

Find your crop species in the following list for which Vigo for Agri™ can bring enhanced production results:

Vegetables & Fruit

Fruiting:

Tomatoes, Sweet Peppers, Chillies, Cucumbers & Strawberries – treatment with Vigo for Agri™ results in an increase in fruit number and size.

Rooting:

Treatment with Vigo for Agri™ enhances root development increasing size and shortening time to maturation.

Tuber:

Potatoes, treated with Vigo for Agri™ result in increases in the number of tubers and size.

Bulb:

Onions, treated with Vigo for Agri™ result in an increase in bulb size and shortening the time to maturation.

Podded:

These include both shelled and non-shelled legumes. Treatment with Vigo for Agri™ increases the number of pods.

Summary

added features & benefits

Added Features

- Vigo for Agri™ is 100% natural.
- Vigo for Agri™ can be used in tandem with all fertilisers – chemical and organic.

Added Benefits

- When applied to plants, Vigo for Agri™ increases yield by 16% to 40%.
- Fruit produced is scientifically tested to have the same nutritional value as quality fruit grown without Vigo for Agri™.
- Vigo for Agri™ has an indefinite shelf life.