

HICURE® and aminoacid based products  
Foliar application on Primula (var. Susy Red)

Test 00502216 - January/2017

Rossella Bortolaso  
Adriano Altissimo

**Study Timeframe:**Start: 29<sup>th</sup> September 2016End: 19<sup>th</sup> January 2017**Location:** Landlab srl, Quinto Vicentino-VI- Italy, Nord 45,57° East 11,62° 33 m slm**Model plant:** Primula (Var. Susy Red)**Entries**

- HICURE® 2 ml/L at 500L/ha water
- HICURE® 2 ml/L at 1000L/ha water
- DIAMIN®Bioplus 3 ml/L at 500L/ha water
- DIAMIN®Bioplus 3 ml/L at 1000L/ha water
- BIO-PROTAN®N5 Vegetal 3 ml/L at 500L/ha water
- BIO-PROTAN®N5 Vegetal 3 ml/L at 1000L/ha water
- DIAPTON 3 ml/L at 500L/ha water
- DIAPTON 3 ml/L at 1000L/ha water
- DIAMIN®Basic 3 ml/L at 500L/ha water
- DIAMIN®Basic 3 ml/L at 1000L/ha water

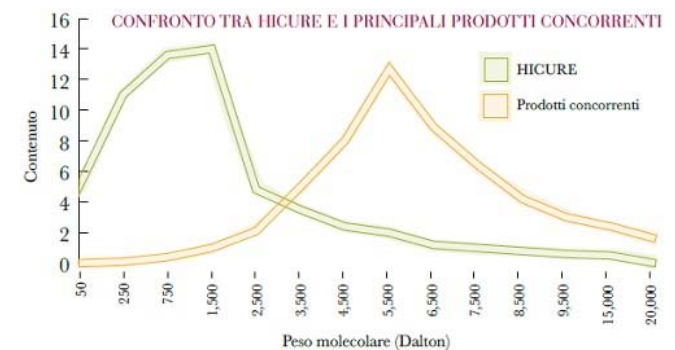
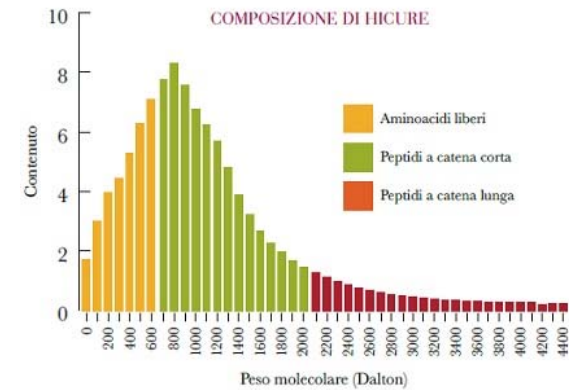
4 plant/rep

4 replications

10 entries x 4 rep x 4 plant = 160 plants

**Assessments:**

- Visual foliage color, two times during the cycle
- DIA (Digital Image Analysis) every week
- Fresh Biomass (flowers+plant) at the end of the cycle

**Hicure Label**

DAP0	29.09.2016	Planting
DAP13	12.10.2016	Fertilization
DAP15	14.10.2016	Foliar Spray DIA
DAP22	21.10.2016	DIA
DAP25	25.10.2016	Fertilization
DAP35	03.11.2016	Foliar Spray DIA
DAP43	11.11.2016	DIA
DAP50	18.11.2016	DIA
DAP56	24.11.2016	Fertilization
DAP57	25.11.2016	DIA
DAP60	28.11.2016	Foliar Spray
DAP64	02.12.2016	DIA
DAP71	09.12.2016	Fertilization DIA first flower appear
DAP78	16.12.2016	Fertilization DIA
DAP85	23.12.2016	Fertilization DIA
DAP92	30.12.2016	Fertilization DIA
DAP98	05.01.2017	Fertilization DIA Flowers count
DAP106	13.01.2017	DIA Flowers count
DAP112	19.01.2017	Final biomass

Application of the products: 500 and 1000 L / ha of water (based on the applied treatment) = 50 ml or 100 ml / sqm.  
 The volume of water is doubled while the quantity of product per Liter of water remains unchanged.  
 Therefore, to 1000 L / ha the product is applied double as much compared to the application with 500 L / ha.







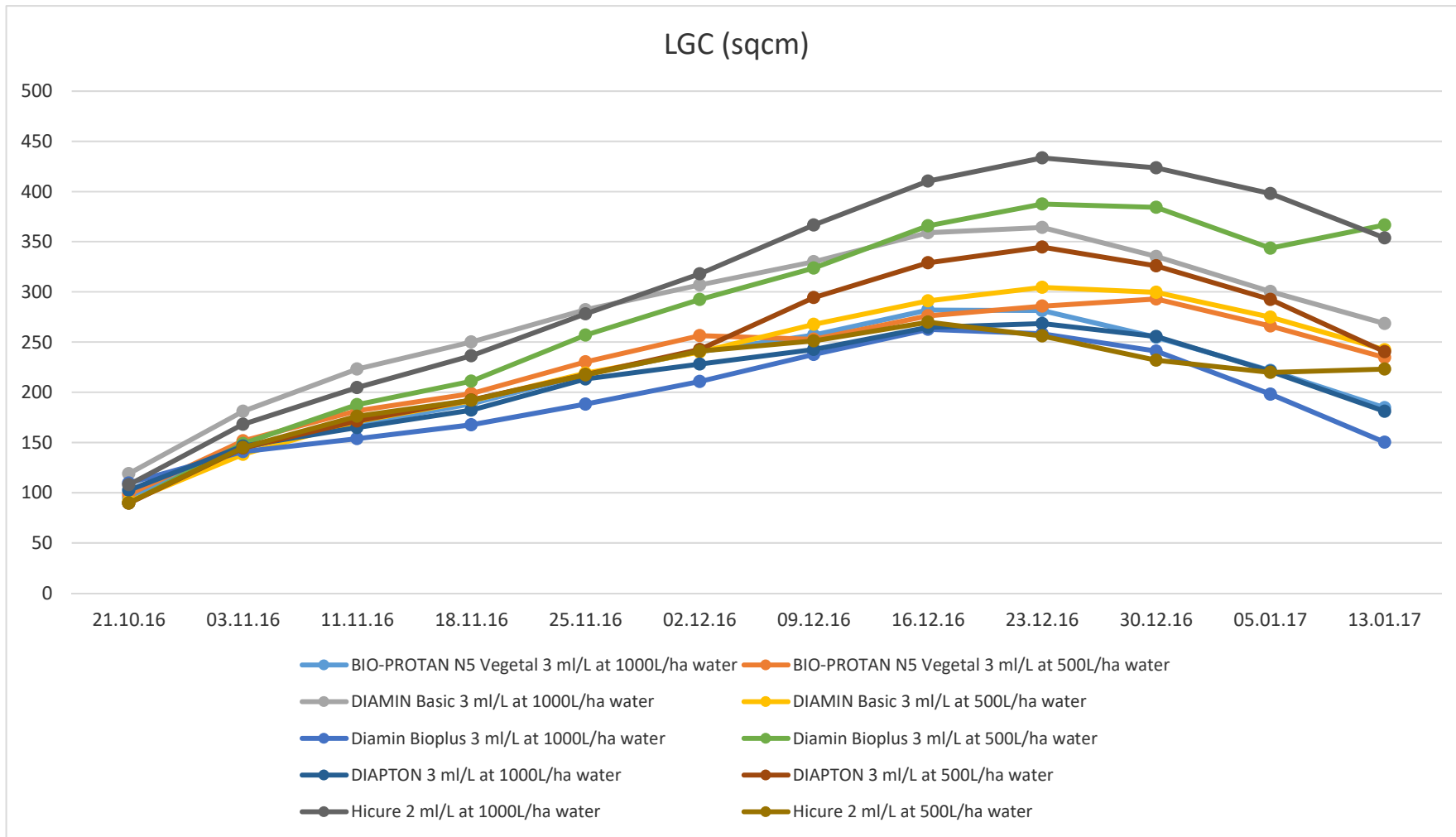
DAP 71, appearance of first flowers





Some examples of images collected for pairs of plants



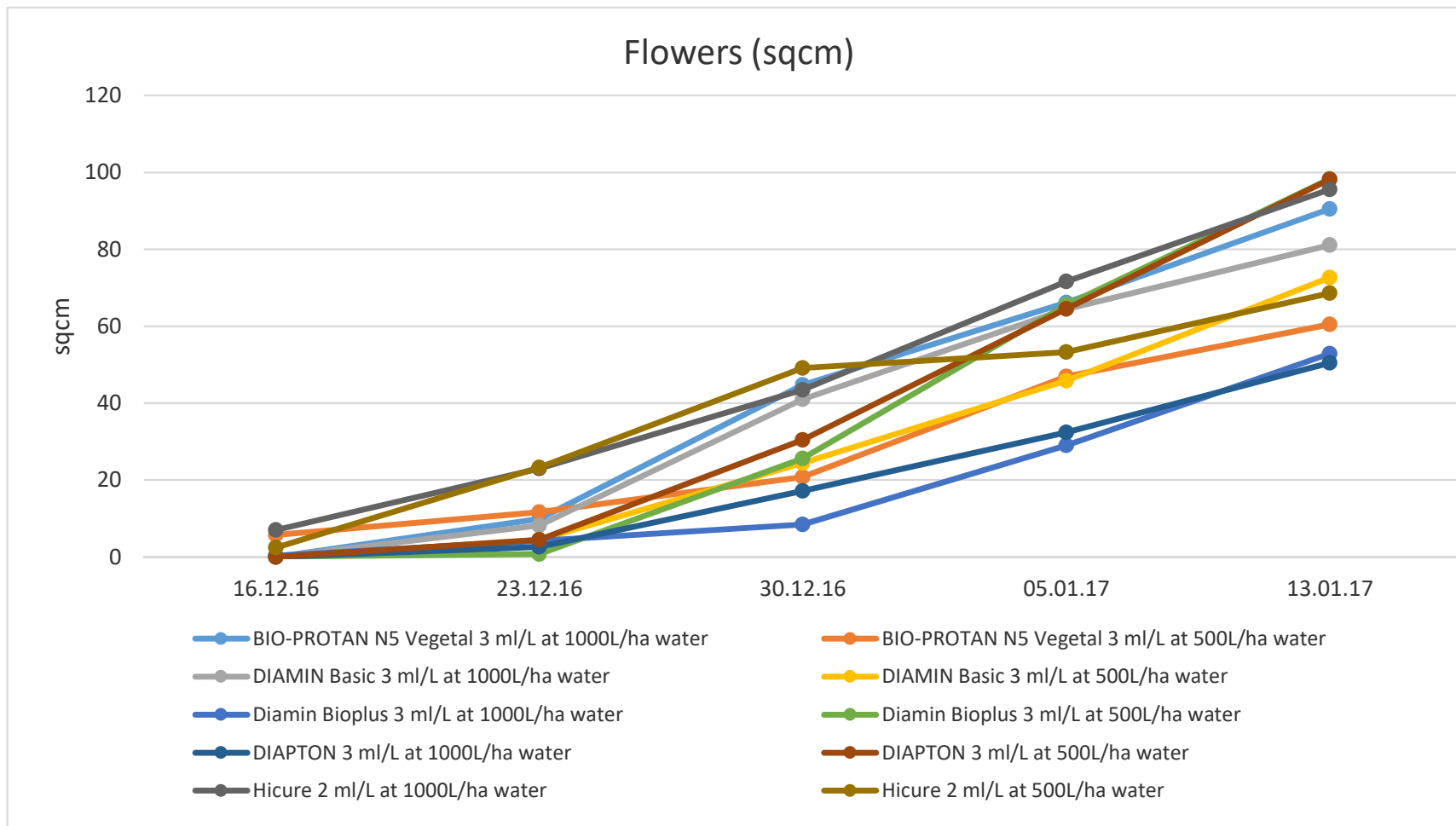


Clear development for the HICURE® thesis at 2 ml / L with 1000 L / ha application. Good performance also for DIAMIN® Bioplus 3 ml / L at 500 L / ha, with the final peak performance.

	LGC (sqcm) 21.10.16		LGC (sqcm) 03.11.16		LGC (sqcm) 11.11.16		LGC (sqcm) 18.11.16		LGC (sqcm) 25.11.16		LGC (sqcm) 02.12.16		LGC (sqcm) 09.12.16		LGC (sqcm) 16.12.16		LGC (sqcm) 23.12.16		LGC (sqcm) 30.12.16		LGC (sqcm) 05.01.17		LGC (sqcm) 13.01.17			
Entry																										
BIO-PROTAN N5 Vegetal 3 ml/L at 1000L/ha water	95,1	ab	144,5	a	168,1	a	188,5	abc	217,9	ab	240,5	ab	256,9	a	282,0	a	281,6	a	254,8	a	221,9	a	184,8	a		
BIO-PROTAN N5 Vegetal 3 ml/L at 500L/ha water	98,5	ab	151,8	a	181,7	ab	198,8	abc	230,2	ab	256,5	ab	252,9	a	276,3	a	285,7	a	293,0	ab	266,0	ab	234,7	ab		
DIAMIN Basic 3 ml/L at 1000L/ha water	119,1	b	181,1	a	223,2	b	250,1	c	282,3	b	307,1	b	330,0	ab	358,9	ab	364,2	ab	335,3	ab	300,3	ab	268,5	ab		
DIAMIN Basic 3 ml/L at 500L/ha water	91,3	a	138,4	a	171,0	ab	191,5	abc	219,2	ab	240,2	ab	267,6	ab	291,0	ab	304,5	ab	299,5	ab	275,0	ab	242,3	ab		
Diamin Bioplus 3 ml/L at 1000L/ha water	109,6	ab	141,0	a	154,0	a	167,6	a	188,3	a	210,9	a	237,9	a	262,7	a	258,4	a	241,0	a	198,2	a	150,4	a		
Diamin Bioplus 3 ml/L at 500L/ha water	89,8	a	149,0	a	187,6	ab	211,0	abc	256,9	ab	292,5	ab	323,6	ab	365,8	ab	387,4	ab	384,3	ab	343,5	ab	366,5	b		
DIAPTON 3 ml/L at 1000L/ha water	102,7	ab	146,6	a	164,8	a	182,2	ab	213,4	ab	228,0	ab	242,8	a	264,7	a	268,6	a	255,7	a	221,1	a	181,1	a		
DIAPTON 3 ml/L at 500L/ha water	89,8	a	144,6	a	171,4	ab	192,3	abc	217,7	ab	242,8	ab	294,4	ab	328,9	ab	344,6	ab	326,0	ab	292,6	ab	240,4	ab		
Hicure 2 ml/L at 1000L/ha water	108,1	ab	168,1	a	204,9	ab	236,4	bc	278,1	b	317,9	b	366,6	b	410,2	b	433,5	b	423,6	b	397,8	b	353,7	b		
Hicure 2 ml/L at 500L/ha water	89,9	a	145,2	a	176,3	ab	192,2	abc	217,5	ab	241,0	ab	251,3	a	269,9	a	256,2	a	231,9	a	220,0	a	223,3	ab		



LGC (living Ground Cover) via DIA (Digital Image analysis);



Greatest flower area for HICURE® thesis 2 ml / L at 1000 L / ha of water. Good performance for BIO-PROTAN N5 Vegetal at 3 ml / L with 1000 L / ha water, however we suppose resulting from a stress situation for the plant (see final results).



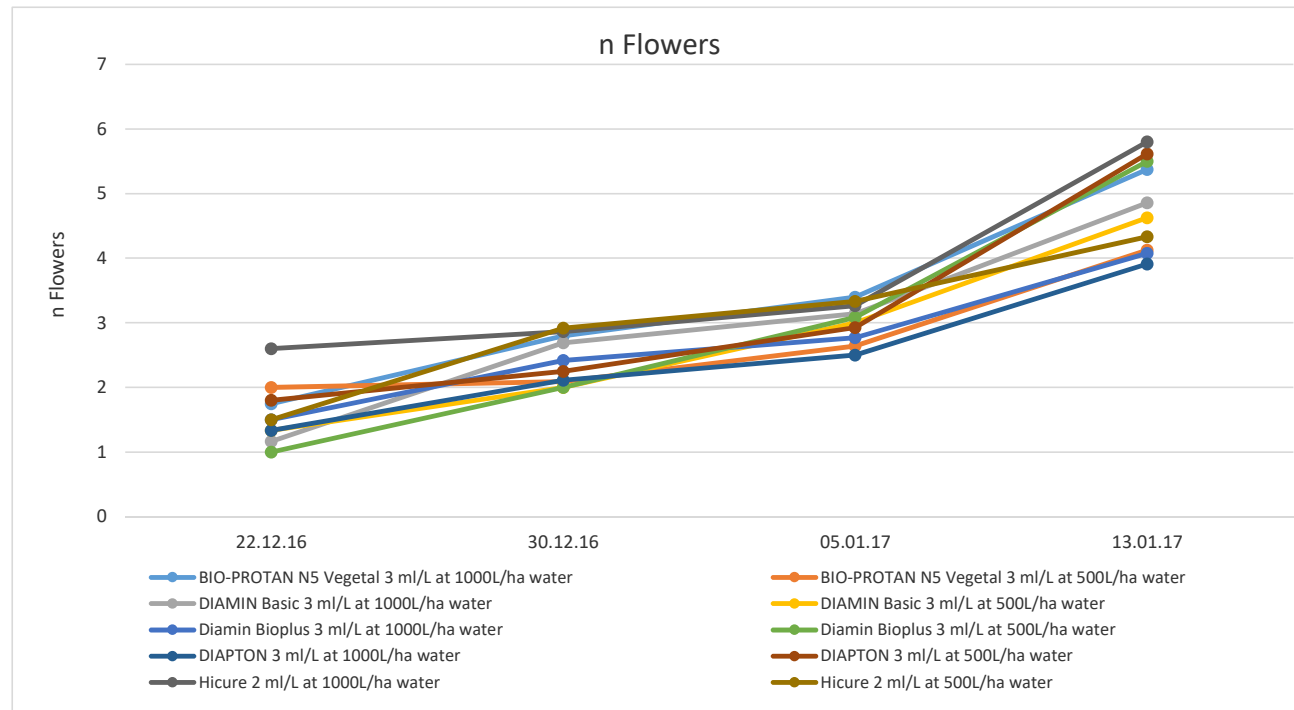
	Flower (sqcm) 16.12.16		Flower (sqcm) 23.12.16		Flower (sqcm) 30.12.16		Flower (sqcm) 05.01.17	
Entry	16.12.16		23.12.16		30.12.16		05.01.17	
BIO-PROTAN N5 Vegetal 3 ml/L at 1000L/ha water	0,0	a	9,8	a	44,7	a	66,1	a
BIO-PROTAN N5 Vegetal 3 ml/L at 500L/ha water	5,8	a	11,6	a	20,8	a	46,9	a
DIAMIN Basic 3 ml/L at 1000L/ha water	0,0	a	8,2	a	41,0	a	64,5	a
DIAMIN Basic 3 ml/L at 500L/ha water	0,0	a	4,5	a	24,4	a	45,9	a
Diamin Bioplus 3 ml/L at 1000L/ha water	0,3	a	4,2	a	8,4	a	29,0	a
Diamin Bioplus 3 ml/L at 500L/ha water	0,1	a	0,7	a	25,6	a	65,6	a
DIAPTON 3 ml/L at 1000L/ha water	0,0	a	2,6	a	17,2	a	32,3	a
DIAPTON 3 ml/L at 500L/ha water	0,0	a	4,5	a	30,4	a	64,6	a
Hicure 2 ml/L at 1000L/ha water	7,0	a	23,0	a	43,5	a	71,6	a
Hicure 2 ml/L at 500L/ha water	2,4	a	23,3	a	49,2	a	53,3	a

There is no statistical difference between the flowering area of the various theses.



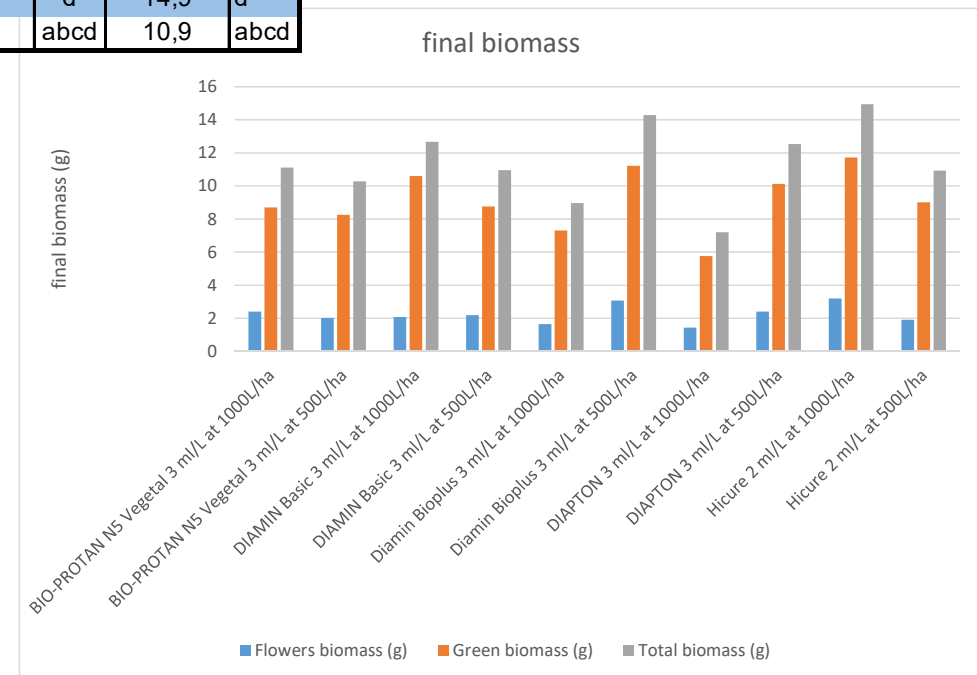
HICURE® 2 ml / L to 1000 L / ha has proven to be a good product. Good results also with DIAMIN® Bioplus 3 ml / L to 500 L / ha water and DIAPTON 3 ml / L to 500 L / ha water.

Entry	n Flower 22.12.16		n Flower 30.12.16		n Flower 05.01.17		n Flower 13.01.17	
	22.12.16		30.12.16		05.01.17		13.01.17	
BIO-PROTAN N5 Vegetal 3 ml/L at 1000L/ha water	1,8	ab	2,8	a	3,4	a	5,4	abc
BIO-PROTAN N5 Vegetal 3 ml/L at 500L/ha water	2,0	ab	2,1	a	2,6	a	4,1	ab
DIAMIN Basic 3 ml/L at 1000L/ha water	1,2	ab	2,7	a	3,1	a	4,9	abc
DIAMIN Basic 3 ml/L at 500L/ha water	1,3	ab	2,0	a	3,0	a	4,6	abc
Diamin Bioplus 3 ml/L at 1000L/ha water	1,5	ab	2,4	a	2,8	a	4,1	ab
Diamin Bioplus 3 ml/L at 500L/ha water	1,0	ab	2,0	a	3,1	a	5,5	abc
DIAPTON 3 ml/L at 1000L/ha water	1,3	ab	2,1	a	2,5	a	3,9	a
DIAPTON 3 ml/L at 500L/ha water	1,8	ab	2,3	a	2,9	a	5,6	bc
Hicure 2 ml/L at 1000L/ha water	2,6	b	2,9	a	3,3	a	5,8	c
Hicure 2 ml/L at 500L/ha water	1,5	ab	2,9	a	3,3	a	4,3	abc



Entry	Final biomass flowers (g)		Final green biomass (g)		Fb TOT (g)	
	19.01.17		19.01.17		19.01.17	
BIO-PROTAN N5 Vegetal 3 ml/L at 1000L/ha water	2,4	abc	8,7	abcd	11,1	abcd
BIO-PROTAN N5 Vegetal 3 ml/L at 500L/ha water	2,0	ab	8,3	abc	10,3	abc
DIAMIN Basic 3 ml/L at 1000L/ha water	2,1	ab	10,6	bcd	12,7	bcd
DIAMIN Basic 3 ml/L at 500L/ha water	2,2	abc	8,8	abcd	11,0	abcd
Diamin Bioplus 3 ml/L at 1000L/ha water	1,7	a	7,3	ab	9,0	ab
Diamin Bioplus 3 ml/L at 500L/ha water	3,1	bc	11,2	cd	14,3	cd
DIAPTON 3 ml/L at 1000L/ha water	1,4	a	5,8	a	7,2	a
DIAPTON 3 ml/L at 500L/ha water	2,4	abc	10,1	bcd	12,5	bcd
Hicure 2 ml/L at 1000L/ha water	3,2	c	11,7	d	14,9	d
Hicure 2 ml/L at 500L/ha water	1,9	a	9,0	abcd	10,9	abcd

DIAMIN®Basic at both levels of application, is always in the same statistical group of HICURE® at 1000 L / ha, except for the flowering biomass (DIAMIN®Basic at 1000 L / ha is statistically different from HICURE® at 1000 L / ha). However looking at the medium-size flower (next slide), DIAMIN®Basic at 1000 L / ha is in the same statistical group of HICURE® at 1000 L / ha.



Entry	LGC sqcm (of 2 plants)	Flowers sqcm (of 2 plants)	N Flowers/plant	Calculation of media flower dimension (sqcm)	LGC sqcm (of 2 plants)	Flowers sqcm (of 2 plants)	N Flowers/plant	Calculation of media flower dimension (sqcm)	LGC sqcm (of 2 plants)	Flowers sqcm (of 2 plants)	N Flowers/plant	Calculation of media flower dimension (sqcm)
	16.12.16	16.12.16	16.12.16	16.12.16	23.12.16	23.12.16	23.12.16	23.12.16	30.12.16	30.12.16	30.12.16	30.12.16
BIO-PROTAN N5 Vegetal 3 ml/L at 1000L/ha	282,0	a 0,0	1,5	0	281,6	a 9,8	1,8	ab 0	254,8	a 44,7	2,8	37,6
BIO-PROTAN N5 Vegetal 3 ml/L at 500L/ha	276,3	a 5,8	1,5	12	285,7	a 11,6	2,0	ab 7	293,0	ab 20,8	2,1	8,7
DIAMIN Basic 3 ml/L at 1000L/ha	358,9	ab 0,0	1,5	0	364,2	ab 8,2	1,2	ab 11	335,3	ab 41,0	2,7	13,0
DIAMIN Basic 3 ml/L at 500L/ha	291,0	ab 0,0	1,0	0	304,5	ab 4,5	1,3	ab 5	299,5	ab 24,4	2,0	9,0
Diamin Bioplus 3 ml/L at 1000L/ha	262,7	a 0,3	1,3	0	258,4	a 4,2	1,5	ab 2	241,0	a 8,4	2,4	1,1
Diamin Bioplus 3 ml/L at 500L/ha	365,8	ab 0,1	0,0	0	387,4	ab 0,7	1,0	ab 1	384,3	ab 25,6	2,0	11,7
DIAPTON 3 ml/L at 1000L/ha	264,7	a 0,0	2,0	0	268,6	a 2,6	1,3	ab 0	255,7	a 17,2	2,1	9,8
DIAPTON 3 ml/L at 500L/ha	328,9	ab 0,0	3,0	0	344,6	ab 4,5	1,8	ab 1	326,0	ab 30,4	2,3	10,4
Hicure 2 ml/L at 1000L/ha	410,2	b 7,0	1,7	0	433,5	b 23,0	2,6	b 31	423,6	b 43,5	2,9	12,5
Hicure 2 ml/L at 500L/ha	269,9	a 2,4	1,0	5	256,2	a 23,3	1,5	ab 10	231,9	a 49,2	2,9	10,2
		n.s	n.s	n.s		n.s		n.s		n.s	n.s	
Entry	LGC sqcm (of 2 plants)	Flowers sqcm (of 2 plants)	N Flowers/plant	Calculation of media flower dimension (sqcm)	LGC sqcm (of 2 plants)	Flowers sqcm (of 2 plants)	N Flowers/plant	Calculation of media flower dimension (sqcm)				
	05.01.17	05.01.17	05.01.17	05.01.17	13.01.17	13.01.17	13.01.17	13.01.17				
BIO-PROTAN N5 Vegetal 3 ml/L at 1000L/ha	221,9	a 66,1	3,4	19,2	184,8	a 90,5	5,4	abc 15,3	bc			
BIO-PROTAN N5 Vegetal 3 ml/L at 500L/ha	266,0	ab 46,9	2,6	12,5	234,7	ab 60,5	4,1	ab 9,1	ab			
DIAMIN Basic 3 ml/L at 1000L/ha	300,3	ab 64,5	3,1	11,0	268,5	ab 81,1	4,9	abc 10,0	abc			
DIAMIN Basic 3 ml/L at 500L/ha	275,0	ab 45,9	3,0	10,0	242,3	ab 72,7	4,6	abc 8,0	ab			
Diamin Bioplus 3 ml/L at 1000L/ha	198,2	a 29,0	2,8	4,3	150,4	a 52,8	4,1	ab 5,2	a			
Diamin Bioplus 3 ml/L at 500L/ha	343,5	ab 65,6	3,1	13,3	366,5	b 98,3	5,5	abc 10,0	abc			
DIAPTON 3 ml/L at 1000L/ha	221,1	a 32,3	2,5	18,7	181,1	a 50,5	3,9	a 7,9	ab			
DIAPTON 3 ml/L at 500L/ha	292,6	ab 64,6	2,9	11,7	240,4	ab 98,2	5,6	bc 9,8	abc			
Hicure 2 ml/L at 1000L/ha	397,8	b 71,6	3,3	20,3	353,7	b 95,5	5,8	c 17,8	c			
Hicure 2 ml/L at 500L/ha	220,0	a 53,3	3,3	10,0	223,3	ab 68,6	4,3	abc 9,1	ab			
		n.s	n.s	n.s		n.s						

BIO-PROTAN®N5 Vegetal induce a kind of stress to the plants, encouraging the development of flowers instead of the leaf tissue. The average size of the flowers is greater for plants treated with BIO-PROTAN® N5 Vegetal at 1000 L / ha. However, the thesis HICURE® becomes in January the thesis with the biggest flowering area and larger flowers. We want to stress out that DIAMIN®Basic is the only product that, applied at 500 and 1000 L / ha, always remains in the same statistical group of HICURE® at 1000 L / ha. Note that HICURE® to 500 L / ha (worst performer of the two HICURE® thesis) is not always in the same statistical group of HICURE® at 1000 L / ha.