# Agronomic valorisation of ALGAREN TWIN®, a historical biostimulant based on *Ecklonia maxima* and selected yeast extracts.

Christian Garabello[1], Giuseppe Sciannamea[2], Riccardo Fusiello[2]
[1]Greenhas Group, c.so Alba 85/89, 12043 Canale (CN), Italy
[2]Agroservice R&S S.r.l. – Contrada Papparicotta s/n, S.P. 231 km56+200 - 76123 Andria (BT) - ITALY

## BACKGROUND

Flowering and fruit set are crucial growth phases for plants. Any physiological imbalance that occurs during these phases will unavoidably impair crop yield and the quality of the production.

Since these unbalances are more and more frequent due to the climate change or intensive agricultural approaches, Greenhas Group developed several solutions to make crops more performant and to ensure adequate profit also in case of unfavourable conditions.

Algaren Twin is an organic fluid bio-activator released in 2009 containing *Ecklonia maxima* and exclusive yeast extracts that, thanks to the presence of hormone-like and antioxidant compounds, promotes flowering, fruit setting and fruit retention also under abiotic stress conditions.

Taking advantage of the field trials carried out for claim demonstration for registration of Algaren Twin as a EU Plant Biostimulant (Reg. EU. 1009/2019), R&D department of Greenhas Group got useful information to consolidate the knowledge about the product and to refine its technical positioning.

The results shown in the present work were obtained from field trials carried out in 2020 by the Italian contract research organisation Agroservice R&S s.r.l. (Andria - BT - Italy).

## RESULTS

### SWEET CHERRY (var. Ferrovia)

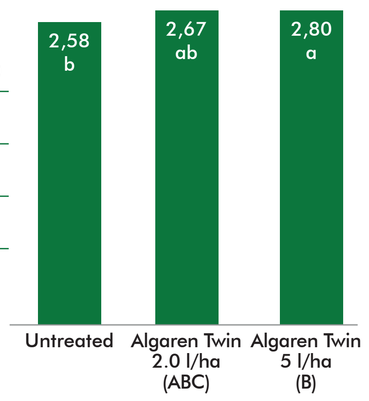
| Treatment | | Timing |
|---|---|---|
| T1 | Untreated | --- |
| T2 | Algaren Twin 2.0 l/ha | ABC |
| T3 | Algaren Twin 5.0 l/ha | B |

A: Just before flowering (BBCH 59)
B: End of flowering (BBCH 69)
C: Fruit setting (BBCH 71)

| | | | 7 DA-C % fruit set [1] | 36 DA-C, harvest % fruit retention [2] |
|---|---|---|---|---|
| T1 | Untreated | --- | 18.9 a | 10.8 b |
| T2 | Algaren Twin 2.0 l/ha | ABC | 19.6 a | 13.7 a |
| T3 | Algaren Twin 5.0 l/ha | B | 20.1 a | 14.7 a |

[1](№ fruits set/№ flowers)x100
[2](№ fruits at harvest/№ fruits set)x100
Assessments carried out on 5 branches/plant (previously marked)
S-N-K test, p = 0.15

**Yield (t/ha)**



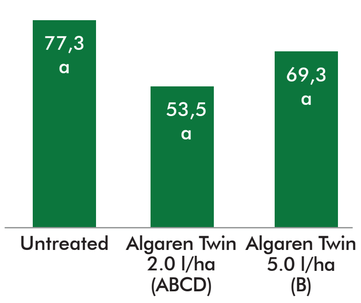
**BENEFITS**
- Fruit set improvement
- Increase of fruit retention (fruit drop reduction during whole season)
- Yield increase
- High flexibility in product application (single or fractionated applications)

### CLEMENTINE (var. Loretina®)

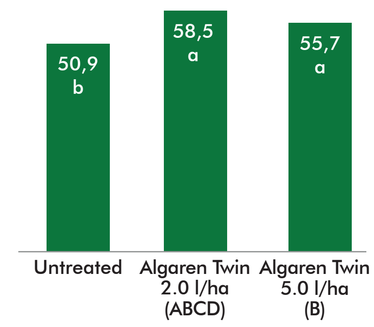
| Treatment | | Timing |
|---|---|---|
| T1 | Untreated | --- |
| T2 | Algaren Twin 2.0 l/ha | ABCD |
| T3 | Algaren Twin 5.0 l/ha | B |

A: Just before flowering (BBCH 57)
B: End of flowering-fruit set (BBCH 69-71)
C: Fruit development , Ø 20 mm (BBCH 73)
D: Beginning of colouring (BBCH 81)

**37 DA-B**
**Fruit drop (№ fallen fruit/m²)**




**Yield (t/ha)**




S-N-K test, p = 0.15

**BENEFITS**
Decrease of fruit drop •
Yield increase •
High flexibility in product application (single or fractionated applications) •

### TABLE GRAPE (var. Italia, Seeded white)

| Treatment | | Timing |
|---|---|---|
| T1 | Untreated | --- |
| T2 | Algaren Twin 2.5 l/ha | ABCD |
| T3 | Local standard [3] | C |

[3] *Forchlorfenuron 9.75 g a.i./ha*

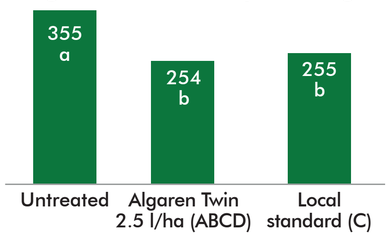
### TABLE GRAPE (var. Sweet Celebration®, Seedless red)

| Treatment | | Timing |
|---|---|---|
| T1 | Local standard [3] | B |
| T2 | Local standard [3] + Algaren Twin 2.5 l/ha | B ABCD |

[3] *Forchlorfenuron 9.75 g a.i./ha*

| A: Before flowering (BBCH 57-59) | B: End of flowering-fruit set (BBCH 69-71) | C: Berry Ø 10 mm (BBCH 73) | D: Berry Ø 15 mm (BBCH 75) |
|---|---|---|---|

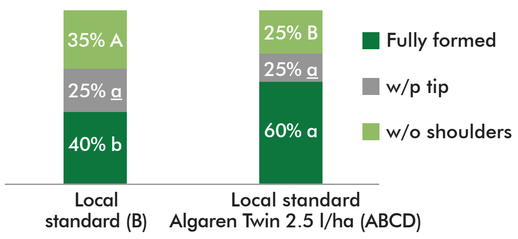
**Var. Italia**
**Millerandage - Time for berry thinning [1] (h/ha)**




| Yield (t/ha) | 42.3 a | 43.8 a | 44.2 a |
|---|---|---|---|

[1] Manual removal of small berries S-N-K test, p = 0.15

**Var. Sweet celebration®**
**Bunch architecture**




| Yield (t/ha) | 27.0 a | 32.8 b |
|---|---|---|

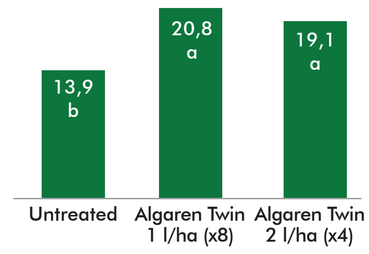
S-N-K test, p = 0.15

**BENEFITS**
- Alleviation of millerandage → reduction of thinning cost
- Enhancement of bunch architecture
- Potential alternative of PGRs in seeded variety or organic farming
- Good synergy with PGRs in seedless variety

### CHERRY TOMATO (var. Porpora F1) (Greenhouse conditions)

| Treatment | | № applications | Timing |
|---|---|---|---|
| T1 | Untreated | --- | --- |
| T2 | Algaren Twin 1.0 l/ha | 8 | From planting, 1-week interval |
| T3 | Algaren Twin 2.0 l/ha | 4 | From planting, 2-week interval |

**Fruit set**
**(№ fruits/m²)[4]**




| Yield (t/ha)[4] | 15.0 b | 20.5 a | 17.9 ab |
|---|---|---|---|

[4] Evaluation carried out on the first three clusters S-N-K test, p = 0.15

**BENEFITS**
Higher fruit set (increase of harvested fruits) •
No impairment in fruit size •
Proportional yield increase •
High flexibility in product application •

## CONCLUSIONS

Over the last three years, 50+ field trials were carried out by different CRO's in order to refresh the knowledge about Algaren Twin and to refine its technical positioning. A large part of the results, including the ones reported in this work, confirmed that Algaren Twin represents a very good option in the farmers toolbox for the promotion of flowering and fruit formation and their protection against abiotic stress.
In fact, besides the promotion of fruit setting, a very good effect in the alleviation of fruit drop was often observed. Moreover, despite a higher number of fruit retained by plants, fruit size was never negatively affected as well as the quality traits of production.

The effect of Algaren Twin is due to the synergic action of its component: the auxyn-like activity of *Ecklonia maxima* extract that promotes the flower organ development and relevant fertility and the protection from physiological unbalance due to abiotic stress, given by the antioxidant compound coming from the yeast extract. As demonstrated by the reported trials, Algaren Twin can be used in all the crops with a very wide range of applicative option. To maximise the effect of the product it must be applied between the flower formation and the fruit setting. Additional applications can be carried out to ensure a whole protection against fruit drop and to boost coloration process (data not shown).