European Commission

Draft Assessment Report prepared according to the Commission Regulation (EU) N° 1107/2009

24-EPIBRASSINOLIDE

Volume 3 – B.3 (PPP) – Sunergist

Rapporteur Member State: Austria

Version History

When	What
2018/05	Initial DAR

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B.3. DATA ON APPLICATION AND EFFICACY

B.3.1. FIELD OF USE ENVISAGED

Agriculture: Viticulture (table and wine grape), vegetable production (lettuce, cucurbits), and arable crops (sugar beet).

Sunergist (active ingredient: 24-Epibrassinolide) is an elicitor of plant's self-defence mechanisms against fungal diseases on wine and table grapes, leafy vegetables (e.g. lettuce) and sugar beet. Moreover, Sunergist is a plant activator to protect plants against abiotic stresses and to improve plant health in wine and table grapes and cucurbits.

B.3.2. EFFECTS ON HARMFUL ORGANISMS

Sunergist contains the active substance 24-Epibrassinolide which is a natural occurring elicitor of plant's self-defence mechanisms and a plant activator. 24-Epibrassinolide is recognized by plant receptors and triggers a cascade of biochemical reactions and protein-protein interactions.

Sunergist has no direct fungicidal or antagonistic effect against harmful organisms.

Sunergist is applied preventively before biotic or abiotic stress occurs. Application of Sunergist in the appropriate stage of plant development and within a certain concentration range activates plant activity and elicits plant's self-defence mechanisms resulting in a more efficient response when pathogens attack the plant or when environmental stress occurs.

B.3.3. DETAILS OF INTENDED USE

GAP rev.03, date: 2017-06-29

PPP (product name/code):	**Sunergist**	Formulation type:	**Soluble liquid (SL)**
Active substance 1:	**24-Epibrassinolide**	Conc. of as 1:	**0.01% (w/w) 24-Epibrassinolide** **0.099 g/L 24-Epibrassinolide**
Active substance 2:	**none**	Conc. of as 2:	**not relevant**
Active substance….:	**none**	Conc. of as ….:	**not relevant**
Safener:	**none**	Conc. of safener:	**not relevant**
Synergist:	**none**	Conc. of synergist:	**not relevant**
Applicant:	**Suntton GmbH / Member of Suntton companies** **WORLD TRADE CENTER** **City Airport Bremen** **Hermann-Köhl-Straße 7** **28199 Bremen / Germany**	Professional use:	☒
Zone(s): To be decided		Non professional use:	☒
Verified by MS:	Yes		
Field of use:	**Elicitor, Plant Activator**		

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Use-No. (e)	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F, Fn, Fpn G, Gn, Gpn or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	**Application**				**Application rate**			**PHI** (days)	**Remarks:**
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	L product / ha a) max. rate per appl. b) max. total rate per crop/season	g as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min / max		e.g. g safener/synergist per ha (f)
Zonal uses (field or outdoor uses, certain types of protected crops)													
1	All Member states	*Vitis vinifera* VITVI (wine grapes and table grapes)	F	Elicitor *Botryotinia fuckeliana* (BOTRCI) Grey mould	Spraying	BBCH 15 to 85	a) 3 b) 3	7 days	a) 0.5 L/ha b) 1.5 L/ha a) 0.35 L/10000 m² tLWA* b)1.05 L/10000 m² tLWA*	a) 0.05 g/ha b) 0.15 g/ha a) 0.04 g/10000 m² tLWA * b) 0.11 g/10000 m² tLWA*	200 - 1000	-	Volumes and doses will vary according to crop canopy size. Dilution rate: 1:2000
2	All Member states	*Vitis vinifera* VITVI (wine grapes and table grapes)	F	Plant activator Prevention environmental stress, quality and yield increase	Spraying	BBCH 71-79	a) 2 b) 2	7 days	a) 0.5 L/ha b) 1.0 L/ha a) 0.35 L/10000 m²	a) 0.05 g/ha b) 0.1 g/ha a) 0.04 g/10000 m² tLWA *	200 - 1000	-	Volumes and doses will vary according to crop canopy size. Dilution rate: 1:2000 to

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Use-No. (e)	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F, Fn, Fpn G, Gn, Gpn or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	**Application**				**Application rate**			**PHI** (days)	**Remarks:** e.g. g safener/synergist per ha (f)
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	L product / ha a) max. rate per appl. b) max. total rate per crop/season	g as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min / max		
									tLWA* b) 0.7 L/10000 m² tLWA*	b) 0.07 g/10000 m² tLWA*			1:3000
3	All Member states	Leaf vegetables e.g. *Lactuca* sp. LACSS (Lettuce LACSA, prickly lettuce LACSE), dandelion TAROF, endive CICEN, chicory CICIN	Fpn	Elicitor *Bremia lactucae* (BREMLA) Downy mildew	Spraying	BBCH 10 to 41	a) 2 b) 2	7 days	a) 0.4 L/ha b) 0.8 L/ha	a) 0.04 g/ha b) 0.08 g/ha	200 - 400	-	Volumes and doses will vary according to crop canopy size. Dilution rate: 1:1000
4	All Member states	Leaf vegetables e.g. *Lactuca* sp. LACSS (Lettuce LACSA, prickly lettuce LACSE), dandelion TAROF, spinach SPQOL, witloof CICIF, chard BEAVV, lamb's lettuce VLLLO, Italian corn salad VLLER, endive CICEN	Fpn	Elicitor *Thanatephorus cucumeris* (RHIZSO) Bottom rot of lettuce	Spraying	BBCH 10 to 41	a) 2 b) 2	7 days	a) 0.4 L/ha b) 0.8 L/ha	a) 0.04 g/ha b) 0.08 g/ha	200 - 400	-	Volumes and doses will vary according to crop canopy size: Dilution rate: 1:1000
5	All Member states	Sugarbeet BEAVA	F	Elicitor *Cercospora beticola* (CERCBE) Leaf spot of beet	Spraying	BBCH 12-39	a) 3 b) 3	7 days	a) 0.4 L/ha b) 1.2 L/ha	a) 0.04 g/ha b) 0.12 g/ha	200-800	-	Volumes and doses will vary according to crop canopy size. Dilution rate: 1:2000
Interzonal uses (use as seed treatment, in greenhouses (or other closed places of plant production), as post-harvest treatment or for treatment of empty storage rooms)													
1	All Member states	Cucurbits 1CUCF/FFFKU e.g. Cucumber CUMSC, zucchini CUUPG, squash CUUPE, pumpkin CUUPM, melon	Gpn	Plant activator *Antistress activity*	Spraying	BBCH 12 to 69	a) 3 b) 3	7 days	a) 0.5 L/ha b) 1.5 L/ha a) 0.25 L/10000 m² tLWA** b) 0.75 L/10000 m² tLWA**	a) 0.05 g/ha b) 0.15 g/ha a) 0.03 g/10000 m² tLWA** b) 0.08 g/10000 m² tLWA**	200-1000	-	Volumes and doses will vary according to crop canopy size. Dilution rate: 1:2000 to 1:3000

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Use-No. (e)	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F, Fn, Fpn G, Gn, Gpn or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	**Application**				**Application rate**			**PHI** (days)	**Remarks:**
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	L product / ha a) max. rate per appl. b) max. total rate per crop/season	g as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min / max		e.g. g safener/synergist per ha (f)
		CUMME, water melon CITLA											
2	All Member states	Leaf vegetables e.g. *Lactuca* sp. LACSS (Lettuce LACSA, prickly lettuce LACSE), dandelion TAROF, endive CICEN, chicory CICIN	Gpn	Elicitor *Bremia lactucae* (BREMLA) Downy mildew	Spraying	BBCH 10 to 41	a) 2 b) 2	7 days	a) 0.4 L/ha b) 0.8 L/ha	a) 0.04 g/ha b) 0.08 g/ha	200 - 400	-	Volumes and doses will vary according to crop canopy size. Dilution rate: 1:1000
3	All Member states	Leaf vegetables e.g. *Lactuca* sp. LACSS (Lettuce LACSA, Prickly lettuce LACSE), dandelion TAROF, spinach SPQOL, witloof CICIF, chard BEAVV, lamb's lettuce VLLLO, Italian corn salad VLLER, endive CICEN	Gpn	Elicitor *Thanatephorus cucumeris* (RHIZSO) bottom rot of lettuce	Spraying	BBCH 10 to 41	a) 2 b) 2	7 days	a) 0.4 L/ha b) 0.8 L/ha	a) 0.04 g/ha b) 0.08 g/ha	200 - 400	-	Volumes and doses will vary according to crop canopy size: Dilution rate: 1:1000

* The application rate of 0.035 g a.s/ 10000 m² treated Leaf Wall Area (tLWA) is equivalent to 0.05 g a.s./ha ground area, assuming an average tLWA of 14285 m² and a maximal water amount of 1000 L/ha.
For calculation of the tLWA a spray volume of 700 L per 10.000 m² LWA was assumed for wine– and table grapes which leads to a tlWA of 14285 m² when 1000 L are applied. The final determination of the minimum effective dose (per tLWA) will be carried out during product assessment on zonal level.

** The application rate of 0.025 g a.s/ 10000 m² tLWA is equivalent to 0.05 g a.s./ha ground area, assuming an average tLWA of 20000 m² and a maximal water amount of 1000 L/ha
For cucurbits a spray volume of 500 L per 10000 m² was assumed which leads to an tLWA of 20000 m² if 1000L are sprayed. The final determination of the minimum effective dose (per tLWA) will be carried out during product assessment on zonal level.

B.3.4. APPLICATION RATE AND CONCENTRATION OF THE ACTIVE SUBSTANCE

Wine grapes and table grapes VITVI:

For the **use as elicitor** for the protection against grey mould BOTRCI (*Botryotinia fuckeliana*) on wine and table grapes, Sunergist is intended to be used with a **maximal application rate of 0.5 L product per ha and application**, corresponding to 0.05 g 24-Epibrassinolide per ha and per application in all Member States.
In regard to calculated leaf wall areas (LWA) for three-dimensional crops, the application rate of 0.035 g a.s./ 10000 m² tLWA is equivalent to 0.05 g a.s./ha ground area, assuming an average LWA of ca. 14300 m² and a maximal water amount of 1000 L/ha.

A **maximum of three applications ~~per season~~** between BBCH 15 and 85 is recommended by foliar application with a minimum of seven days between applications.
The representative formulation Sunergist, containing 0.01 % of 24-Epibrassinolide, acts concentration-dependent and has to be applied with a **dilution rate** of 1:2000.
The required **water volume** for spray applications varies between 200-1000 L water/ha, depending on crop canopy size and plant development. Thus, depending of the required spray volume, **the maximal application rate ~~per season~~** of Sunergist is 1.5 L product per ha, corresponding to 0.15 g 24-Epibrassinolide per ha.

For the **use as plant activator** in wine and table grapes, Sunergist is intended to be used with a **maximal application rate of 0.5 L product per ha and per application**, corresponding to 0.05 g 24-Epibrassinolide per ha in all Member States.

A **maximum of two applications ~~per season~~** between BBCH 71 to 79 is recommended by foliar application with a minimum of seven days between applications.
The representative formulation Sunergist, containing 0.01 % of 24-Epibrassinolide, acts concentration-dependent and has to be applied with a **dilution rate** of 1:2000 to 1:3000.
The required **water volume** for spray applications varies between 200-1000 L water/ha, depending on crop canopy size and plant development. Thus, depending of the required spray volume, the **maximal application rate** of Sunergist is 1.0 L product per ha, corresponding to 0.1 g 24-Epibrassinolide per ha.

Across both uses, a maximum of three applications per season is possible, and the maximal rate of Sunergist is of 1.5 l per ha.

Leafy vegetable crops – e.g. Lettuce LACSA:

For the use as elicitor for the protection against Rhizoctonia RHIZSO (*Thanatephorus cucumeris*) and Downy mildew BREMLA (*Bremia lactucae*) in field and greenhouse for professional and non-professional use, Sunergist is intended to be used with a **maximal application rate of 0.4 L product per ha and application**, corresponding to 0.04 g 24-Epibrassinolide per ha and per application in all Member States.

A **maximum of two applications per season** between BBCH 10 to 41 is recommended by foliar application with a minimum of seven days between applications.

The representative formulation Sunergist, containing 0.01% of 24-Epibrassinolide acts concentration-dependent and has to be applied with a **dilution rate** of 1:1000. The required **water volume** for spray applications varies between 200-400 L/ha water, depending on crop canopy size, crop density and plant development. Thus, depending of the required spray volume, the **maximal application rate per season** of Sunergist is 0.8 L product per ha, corresponding to 0.08 g 24-Epibrassinolide per ha.

Sugar beet BEAVA:

For the use as elicitor for the protection against CERCBE *Cercospora beticola*, Sunergist is intended to be used with a maximal application rate of 0.4 L product per ha and application, corresponding to 0.04 g 24-Epibrassinolide per ha and per application in all Member States.

A **maximum of three applications per season** between BBCH 12 to 39 is recommended by foliar application with a minimum of seven days between applications.

The representative formulation Sunergist, containing 0.01% of 24-Epibrassinolide acts concentration-dependent and has to be applied with a **dilution rate** of 1:2000. The required **water volume** for spray applications varies between 200-800 L/ha water, depending on crop canopy size, crop density and plant development. Thus, depending of the required spray volume, the **maximal application rate per season** of Sunergist is 1.2 L product per ha, corresponding to 0.12 g 24-Epibrassinolide per ha.

Cucurbits 1CUCF/FFFKU:

For the use as plant activator in greenhouse for professional and non-professional use, Sunergist is intended to be used with a **maximal application rate of 0.5 L product per ha and application**, corresponding to 0.05 g 24-Epibrassinolide per ha and per application in all Member States.
In regard to calculated leaf wall areas (LWA) for three-dimensional crops, the application rate of 0.03 g a.s./ 10000 m² tLWA is equivalent to 0.05 g a.s./ha ground area, assuming an average LWA of 20000 m² and a maximal water amount of 1000 L/ha.

A **maximum of three applications per season** between BBCH 12 to 69 is recommended by foliar application with a minimum of seven days between applications.

The representative formulation Sunergist, containing 0.01% of 24-Epibrassinolide acts concentration-dependent and has to be applied with a **dilution rate** of 1:2000 to 1:3000. The required **water volume** for spray applications varies between 200-1000 L/ha water, depending on crop canopy size and plant development. Thus, depending of the required spray volume, the **maximal application rate per season** of Sunergist is 1.5 L product per ha, corresponding to 0.15 g 24-Epibrassinolide per ha.

B.3.5. METHOD OF APPLICATION

Sunergist (active substance: 24-Epibrassinolide) is an **elicitor** of crop's self-defence mechanisms against fungal diseases such as grey mould BOTRCI (*Botryotinia fuckeliana*) on table grape and wine grape VITVI, downy mildew BREMLA (*Bremia lactucae*) and bottom rot RHIZSO (*Thanatephorus cucumeris*) on leaf vegetables (e.g. lettuce) and CERCBE (*Cercospora beticola*) on sugar beet. Moreover, Sunergist is **a plant activator** with stress-protective properties against abiotic stress intended to be uses in grapevine and cucurbits.

Sunergist has **to be applied preventively** before biotic or abiotic stress occurs by **foliar spray applications** or by means of **air blast spraying in three-dimensional crops**.

The required **water** volume for spray applications varies between 200-1000 L/ha, depending on crop canopy size, plant development and the treated crops (please refer to the GAP-table under B.3.3). Complete coverage of the plant surface is required to achieve effectiveness.

Sunergist is well mixable with water. The spray mixture should be kept at pH 6-7 and used within 24 hours. During foliar application the spray mixture should be stirred well.

Sunergist is to be applied at dry conditions and on dry foliage. The application should be repeated, if rainfall occurs within 4 h after application. On very hot days with high solar irradiation, Sunergist should be applied in the early morning or the late afternoon. Sunergist should be applied according to Good Agricultural Practice.

B.3.6. NUMBER AND TIMING OF APPLICATIONS AND DURATION OF PROTECTION

Wine grapes and table grapes VITVI:

For the use as **elicitor** for the protection against grey mould BOTRCI (*Botryotinia fuckeliana*) on wine and table grapes, **a maximum of three applications** of Sunergist per season **between BBCH 15 and 85** is recommended in the Member States.

For the use as **plant activator** on wine and table grapes, **a maximum of two applications** of Sunergist per season **between BBCH 71 and 79** is recommended in the Member States.

For both uses in wine resp. table grape, the maximum number of applications per crop and year is three (see also B.3.4).

Interval between applications should be 7 days.

Duration of protection is 21 days for the use as elicitor, and 14 days for the use as plant activator.

Leafy vegetable crops – e.g. Lettuce LACSA:

For the use as **elicitor** for the protection against Rhizoctonia RHIZSO (*Thanatephorus cucumeris*) and Downy mildew BREMLA (*Bremia lactucae*) in field and greenhouse for professional and non-professional use, **a maximum of two applications** of Sunergist per season **between BBCH 10 and 41** are recommended in the Member States.

Interval between applications should be 7 days.

Duration of protection is 14 days for the use as elicitor.

Sugar beet BEAVA:

For the use as **elicitor** for the protection against Cercospora beticola, **a maximum of three applications** of Sunergist per season **between BBCH 12 and 39** is recommended in the Member States.

Interval between applications should be 7 days.

Duration of protection is 21 days for the use as elicitor.

Cucurbits 1CUCF/FFFKU:

For the use as **plant activator** in greenhouse for professional and non-professional use, **a maximum of three applications** of Sunergist per season between BBCH 12 to 69 is recommended in the Member States.

Interval between applications should be 7 days.

Duration of protection is 21 days for the use as plant activator.

B.3.7. NECESSARY WAITING PERIODS OR OTHER PRECAUTIONS TO AVOID PHYTOTOXIC EFFECTS ON SUCCEEDING CROPS

Minimum waiting periods or other precautions between last application and sowing or planting of succeeding crops: not applicable

Limitations on choice of succeeding crops: not applicable

Brassinosteroids including 24-Epibrassinolide are naturally occurring, plant growth promoting molecules, present in higher plants, lower plants, and outside the regnum of plants, also in higher fungi. Therefore any negative effect onto succeeding crops is unlikely.

B.3.8. PROPOSED INSTRUCTIONS FOR USE

Wine grapes and table grapes VITVI:
For the use as elicitor for the protection against grey mould (*Botryotinia fuckeliana*), a maximum of three applications ~~per season~~ between BBCH 15 to 85 by foliar application with a minimum of seven days between applications is recommended.
For the use as plant activator, a maximum of two applications ~~per season~~ between BBCH 71 to 79 by foliar application with a minimum of seven days between applications in all Member States is recommended.
Spray volume: For foliar spraying: 200 to 1000 L/ha in all Member States (product dilution rate 1:2000 for elicitor use and 1:2000 to 1:3000 for plant activator use)

Leafy vegetable crops (e.g. Lettuce LACSA):

For the use as elicitor for the protection against Rhizoctonia (*Thanatephorus cucumeris*) and Downy mildew (*Bremia lactucae*) in field and greenhouse, a maximum of two applications per season between BBCH 10 to 41 by foliar application with a minimum of seven days between applications in all Member States is recommended.
Spray volume: For foliage spraying: 200 to 400 L/ha in all Member States (product dilution rate 1:1000)

Sugar beet BEAVA:
For the use as elicitor for the protection against *Cercospora beticola,* a maximum of three applications per season between BBCH 12 to 39 by foliar application with a minimum of seven days between applications in all Member States is recommended.
Spray volume: For foliar spraying: 200 to 800 L/ha in all Member States (product dilution rate 1:2000)

Cucurbits 1CUCF/FFFKU:
For the use as plant activator, a maximum of three applications per season between BBCH 12 to 69 by foliar application with a minimum of seven days between applications in all Member States is recommended.
Spray volume: For foliar spraying: 200 to 1000 L/ha in all Member States (product dilution rate 1:2000 to 1:3000)

For all uses:
Apply preventively before biotic or abiotic stress occurs.
Complete coverage of the plant surface is required to achieve effectiveness.
Mix with water and stir well during foliar application. Keep spray solution at pH 6-7. Use spray mixture within 24 hours.
Apply at dry conditions and on dry foliage.
Repeat the application, if rainfall occurs within 4 h after application.
Apply in the early morning or the late afternoon on hot days with high solar irradiation.
Apply according to Good Agricultural Practice.

B.3.9. EFFECTIVENESS

The applicant provided a concise efficacy summary of the new active substance 24-Epibrassinolide contained in the product Sunergist, according to SANCO/10054/2013-rev.3 from 11 July 2013. The list of all individual trials will be presented in detail in this document:

Data point addressed:	CP 3.9/01
Author(s) (year):	Anonymous (2017)
Title:	EFFICACY INFORMATION CONCISE SUMMARY - SUNERGIST (0.01% (w/w) 24-EPIBRASSINOLIDE)
Laboratory report / project Number (Doc. No.):	Not applicable (381-002)
Testing facility:	Not applicable
Published:	No
Test guideline used:	Not applicable
Deviations:	None
GLP:	No

B.3.9.1. Preliminary tests

In order to prove abiotic effects of Sunergist (containing 24-Epibrassinolide) as **plant activator**, e.g. prevention of environmental stress and the quality and yield increase, five trials were performed in North America California on table grapes (3) and wine grapes (2) in 2015.
These preliminary studies were also performed to define the effective dose of Sunergist to be applied and the development stage of grapes where the application of Sunergist is most effective.
According EPPO guideline PP1/269 (1) "Comparable climates on a comparable level" conducted in the USA are fully comparable to the Mediterranean zone. However, cropping systems and grapevine varieties are extremely diverging across viticultural regions even within Europe.
All trials were conducted by an officially recognized organization, but were not GEP. Concerning preliminary studies non-GEP trials are deemed acceptable.

In **table grape trials** a spray volume of 1400 l/ha was applied. Sunergist was applied alone (USA-01-VITVI), or at the same time resp. subsequent to PGRs such as gibberellic acid, or forchlorfenuron (USA-02-VITVI, USA-03-VITVI).
In **wine grape trials** lower spray volumes of 930 l/ha were applied. In the trial USA-04-VITVI the fruit size at applications was mainly pea size or bigger. In the trial USA-05-VITVI the first application of Sunergist was conducted at flowering time, followed by the second application at early berry sizing and the third application at pea size.

Table grape trials: In trial USA-01-VITVI the number of berries per "shoulder" were not increased, whereas the test product achieved a significant increase of berry weight per shoulder, and rachis and berry weight per shoulder at a dilution of 1:1893, whereas higher doses had lower and only numerical effects.
Yield (random berry weight of 30 berries per 6 bunches) was evaluated in trial USA-02-VITVI, and a significant increase was seen at a dilution of 1:1895, and highest at 1:5735 (+ 18 %), whereas the rate in-between had no significant effect, but also an increase in terms of numbers.
In trial USA-01-VITVI the total weight of grapes was assessed, and a numerical increase was recorded, however, statistical significance not indicated.
Regarding the berry color assessment, in trial USA-01-VITVI a delay of ripening (anthocyanin content) was shown, compared to the untreated control. In contrast, in the trial USA-03-VITVI Sunergist application improved the berry color in comparison to the untreated control.
Furthermore, reduced brix content (sugar accumulation) was seen for the test product (18°-16.42°, depending on the concentration) in comparison to the untreated control (18.33°) was observed in the trial USA-01-VITVI. However, the number of bunches was statistically significantly higher in the Sungerist treatments in comparison to the untreated control.

Wine grape trials: In trial USA-04-VITVI Sunergist applied at the highest dilution rate of 1:1893 showed the highest and significant color accumulation and the highest increase of the fruit weight.
In the wine grape trial USA-05-VITVI Sunergist applied at the dilution of 1:1893 showed count of bunches comparable to the untreated control, however a lower bunch weight and a reduced yield was observed. By applying Sunergist with a dilution of 1:3785 and 1:5735 an increase of yield in comparison to the untreated control was achieved, and a higher number of bunches was observed. The highest rate of Sunergist applied at the dilution of 1:1893 showed a lower yield compared to the dilution of 1:3785 and 1:5735, due to high effective dose of Sunergist during the cool weather conditions in the trial season in this region 2015.

Conclusion: As shown in five California (US) non-GEP trials, Sunergist treatments applied at dilution rates of 1:1893 to 1:3785 increased the yield.
In all three table grape trials yield increased in terms of numbers, and at some concentrations also a statistically significant increase compared to the untreated/PGR-treated reference was seen. However, the best effect was seen at different concentrations. If the test product was applied solely, the best and significant effect was seen at the highest dilution rate of 1:1893. However, in two trials a delay of ripening was shown (berry color, sugar content of berries), whereas in the third berry color was improved.
In one wine grape trial the onset of ripening was promoted, and yield was increased at the highest dilution rate, whereas in the other trials a lower bunch weight and a reduced yield was observed at the same dilution rate. This was linked to cool weather conditions in the trial season.
Crop density resp. treated canopy height was not indicated in the reports.

B.3.9.2. Testing effectiveness

B.3.9.2.1. Control of *Botryotinia fuckeliana* (BOTRCI) on grapevine (VITVI), table and wine grapes

In order to prove the efficacy of 24-Epibrassinolide contained in Sunergist as elicitor against BOTRCI *Botryotinia fuckeliana* (grey mould) in the field, **one table grape trial** was performed in 2015 in Spain and **three wine grape studies** were performed in Austria and Germany in 2015 and 2016. All trials were conducted by an officially recognized organisation, nevertheless, thereof only the Spanish trial was GEP (ES-01-VITVI). All Maritime zone trials (AT, DE) were non-GEP, nevertheless presented below, so get some impression on the product performance in the Central zone. In the Spanish trial also different doses were assessed, to determine a minimum effective dose.

In the **Spanish GEP-trial** (ES-01-VITVI) two applications were conducted by using a water volume of 600 to 800 l/ha. The first application (A) was performed at BBCH 66; the second application (B) was performed at BBCH 83.
24-Epibrassinolide contained in Sunergist was applied at product rates of 0.25 mL/L (1:4000), 0.5 mL/L (1:2000) and 1 mL/L (1:1000) to evaluate the effect of Sunergist against (BOTRCI) on table grape.
In addition, Sunergist was applied at 0.25 ml/L together with 0.03 L/hl Acido Giberelico SL (a.s. 1.6% Gibberelic Acid) at the first application (A) and alone at the second application (B). Furthermore, a treatment with Acido Giberelico SL applied once at the first application (A) with a dose rate of 0.03L/hl was conducted.
The infection level of *Botryotinia fuckeliana* (grey mold) in the Spanish trial (ES-01-VITVI) was very low (9 % incidence, and 1.32 % severity at BBCH 85).
The solo application with Sunergist applied at 0.5 mL/L (equivalent to the dilution rate of 1:2000) showed a grey mold reduction of 57% in comparison to the untreated control. The treatment with Sunergist applied at 1.0 mL/L (equivalent to the dilution rate of 1:1000) showed a grey mold reduction of 64% in comparison to the untreated control, regarding the pest severity on bunches at the last assessment (after two applications). Efficacy on disease incidence was 22 % resp. 28 % (0.5 ml/l resp. 1 ml/l). Overall, no statistically significant difference was seen between the untreated control plots, and the test product treated plots, irrespective the applied doses.

In the first **Austrian non-GEP trial** (AT-01-VITVI), 24-Epibrassinolide was applied with a dilution rate of 1:2000 on wine grape variety Zweigelt (product dose 0.41 l/ha, 9167 m² LWA). One or two applications were performed, at BBCH 73 and/or BBCH 81.
Pest incidence of BOTRCI at harvest was slightly reduced, however the variability of data was high and no significant differences were obtained, whereas pest severity was significantly decreased irrespective if Sunergist was applied once or twice.

In the second **Austrian non-GEP study** (AT-02-VITVI), 24-Epibrassinolide was applied with a dilution rate of 1:2000 (product dose 0.23 l/ha, 6471 m² LWA) on three different sites/grape varieties. All three vineyards showed in the previous year different sensitivities against “Luna damage” (Weißer Burgunder), high Berry Shrivel incidence (Blauer Zweigelt) and low vine vitality (Grüner Veltiner). Two applications were performed at BBCH 73 and BBCH 81 in the Weißer Burgunder vineyard, and three applications were performed at BBCH73, BBCH 81 and BBCH 83 to 85 in the vineyards Blauer Zweigelt and Grüner Veltliner.
In all three vineyards the infection level with BOTRCI on grapes was very low. Due to the low disease incidence and the high variability, no significant influence of the treatments was determined.

In the **German non-GEP study** (DE-01-VITVI), 24-Epibrassinolide was applied with a dilution rate of 1:2000 (product doses between 0.31 and 0.45 l/ha; quite low 6471 to 10476 m² LWA) on three different trial sites in the year 2015 and on one additional trial site in 2016. In 2016 Sunergist was applied three times between BBCH 56 and BBCH 79 alone and in an additional treatment in combination with a surfactant.
Incidence and severity of BOTRCI on bunches was reduced in all three trials in 2015. Significance of results was not addressed.

Conclusion: To demonstrate efficacy of Sunergist against BOTRCI on grapevine, only one valid GEP trial is available (South zone; EPPO Mediterranean zone), and further 3 non-GEP trials (Central zone, EPPO Maritime zone) – thereof two with sufficient disease pressure - which were kept to increase the poor data basis.
Sunergist was applied 2-3 times between BBCH 66 and 85 at a dilution rate of 1:2000, corresponding to different product doses per ha (0.3-0.5l/ha, if indicated), due to different spray volumes.

In the Spanish GEP-trial conducted at very low disease pressure, the solo application of Sunergist at 0.5 mL/L (equivalent to the dilution rate of 1:2000) showed a grey mold reduction of 57% in comparison to the untreated control. The treatment with Sunergist applied at double the dose of 1.0 mL/L (equivalent to the dilution rate of 1:1000) showed a slight increase in grey mold reduction of 64% (pest severity on bunches at the last assessment). However, no significant difference was seen between the untreated control plots, and the test product.

In the Austrian non-GEP trial with sufficient disease pressure, 24-Epibrassinolide was applied 2-3 times between BBCH 73 and 81 (and 83/85) at a dilution rate of 1:2000. Sunergist numerically reduced BOTRCI incidence, and had a significant effect on disease severity.
Incidence and severity of BOTRCI was reduced at all three sites of the German non-GEP study conducted in 2015. Significance of results was not addressed. LWA was calculated from distance between rows and (estimated) canopy height (ranging from 6471 up to 10476 m²).

The applicant considers Sunergist used as elicitor to be a valuable tool for suppression of *Botryotinia fuckeliana* on table grape and wine grape, especially considering Integrated Pest Management (IPM) schemes.
Overall, significant effects were demonstrated in non-GEP trials only. A numerically reduction of disease incidence and severity on table and wine grapes may be expected.
For product authorisation, further data are needed to demonstrate an economically relevant benefit of the application as elicitor against BOTRCI *Botryotinia fuckeliana* (grey mould) on table and wine grapes.

B.3.9.2.2. Control of *Bremia lactucae* (BREMLA) and *Thanatephorus cucumeris RHIZSO* on lettuce (LACSA)

In order to prove the efficacy of 24-Epibrassinolide contained in Sunergist as elicitor against *Bremia lactucae* (downy mildew) and *Thanatephorus cucumeris* (scientific name: *Rhizoctonia solani*, common name: bottom rot of lettuce), **two field trials** were performed in Germany in 2015 and 2016. All trials were conducted by an officially recognized organization in accordance with the Principles of Good Experimental Practice (GEP). The trials were carried out according to national guidelines (AKLFG01 and AKLFG06 of the German BLAG – LÜCK for vegetables). EPPO PP 1/65 was not followed (e.g. plot size too small), therefore GEP-status of the presented trials has to be doubted.

In the **first German trial** performed in 2015 (DE-01-LACSA), Sunergist was applied at the following product rates: 0.1 L/ha (1:4000), 0.2 L/ha (1:2000) and 0.4 L/ha (1:1000), to evaluate the effect of Sunergist against *Bremia lactucae* and *Rhizoctonia solani* on lettuce.
Two applications were conducted, by using a water volume of 400 l/ha. The first application was performed at BBCH 14 (one day after planting), and the second application was performed 10 days after first application.

Against *Bremia lactucae*, no clear dose response was seen; 0.1 and 0.4 l/ha performed on comparable levels, whereas 0.2 l/ha provided insufficient control (34 % resp. 26 % efficacy, on disease severity resp. incidence)
The solo application with Sunergist applied at 0.4 L/ha (equivalent to the dilution rate of 1:1000) showed a reduction (62 %, disease severity; 45 %, disease incidence) of *Bremia lactucae* on lettuce leaves. The lower dose of 0.1 l/ha slightly outperformed the target dose of 0.4 l/ha. No statistical analysis was presented.

Sunergist at 0.4 L/ha showed also an activity against *Rhizoctonia solani* and a reduced infestation was observed. The proportion of plants in the damage classes 1 and 2 (without attack or slight infestation, usual cleaning effort) was significantly higher (+ 50 %) compared to the lower application rates. Also the number of strongly damaged heads (class 4, no more marketable) was reduced.

The **second German** trial performed in 2016 (DE-02-LACSA) was conducted with two different trial strategies.
First trial strategy was performed to evaluate the effect of Sunergist as elicitor against *Rhizoctonia solani* and *Bremia lactucae* on lettuce. Sunergist was applied two times at three different rates (1:500 equivalent to 0.8 L product/400 water volume/ha, 1:1000 equivalent to 0.4 L product / 400 water volume/ha and 1:2000 equivalent to 0.2 product / 400 L water volume/ha).

These two early applications of the test product (at low disease pressure, and 3 weeks before artificial inoculation) showed negligible efficacy against *Bremia lactucae* (21 %); and also no significant difference was seen between the untreated control plots, and the test product.

Against *Rhizoctonia solani* slight dose response was seen between the doses of 0.2, 0.4 and 0.8 l/ha. At 0.8 l/ha, the number of not marketable heads was reduced by two-thirds, and at 0.4 l/ha by 44 %. The number of marketable heads was increased 3 resp. 3.6 times by Sunergist at 0.4 l/ha resp. 0.8 l/ha.

The second trial strategy was performed to evaluate the effect of Sunergist as elicitor against *Rhizoctonia solani* and *Bremia lactucae* on lettuce in a combined application scheme.
Five applications were conducted with a treatment interval of seven days between the applications.
First application was performed on 22.08.2016 with Acrobat Plus WG (a.s. 90 g/kg Dimethomorph + 600 g/kg Mancozeb) applied at 2.0 kg/ha.
Second application was performed on 29.08.2016 with Ridomil Gold MZ (a.s. 38.8 g/kg Metalaxyl – M + 600 g/kg Mancozeb) applied at 2.0 kg/ha (This was also the second application date for the trial strategy1).

Third application was performed on 05.09.2016 with Acrobat Plus WG (a.s. 90 g/kg Dimethomorph + 600 g/kg Mancozeb) applied at 2.0 kg/ha.
Fourth and fifth application was performed on 12.09.2016 and 19.09.2016, respectively, with Sunergist applied as elicitor at 1:1000 equivalent to 0.4 L product / 400 water volume/ha). The fifth application was performed at the date of the artificial inoculation of downey mildew.
The standard reference product Cuprozin Progress (a.s. 383 g/l copper hydroxide / 250 g/l Cu) was applied at 2.0 kg/ha.
The applicant excluded an influence of Acrobat Plus (applied 27 days before assessment date) since it only active for 14 days. However, with this trial strategy it is not possible to compare the efficacy of the test product resp. reference product to an “untreated” control; i.e. applications 1-3 as mentioned above (Acrobat Plus WG/Ridomil Gold MZ/Acrobat Plus WG), and then kept untreated.

Both combined application schemes showed a significant efficacy against *Bremia lactucae* at the final assessment (performed 13 days after the last application with Sunergist resp. Cuprozin Progress). The efficacy on disease severity was 80% for the Sunergist variant, and 94% for the Cuprozin Progress variant. Against disease incidence the Sungergist variant achieved insufficient control (41 % efficacy), and was clearly outperformed by the Cuprozin progress variant (84 % efficacy). Disease level was high in the untreated control (15.4% severity, 100 % incidence)

Both spray sequences showed also an efficacy against *Rhizoctonia solani*. However, the variant with Sunergist applied two times at 0.4 l/ha did not achieve the same efficacy as the Cuprozin Progress variant. The percentage of plants in the damage class 1 and 2 (without or slight infestation, damage is removed at normal preparation before marketing) was 38%, respectively 95%.
Regarding disease severity, efficacy of both spray sequences was very low (35 resp. 14 %), and only the Cuprozin Progress variant achieved a significant difference to the untreated control. No significant difference was seen between the untreated control plots, and the test product.

Conclusion: To demonstrate efficacy of Sunergist against BREMLA and RHIZSO on LACSA, two GEP field trials (Central zone, EPPO Maritime zone) were presented. EPPO PP 1/65 was not followed in these trials, and statistical analysis was not provided for all assessment kinds.

Sunergist was applied two times, either solely at different doses (0.1/0.2/0.4 l/ha, resp. 0.2/0.4/0.8 l/ha), or additionally as part of a spray sequence (consisting of three conventional sprays followed by the test or the reference product). However, with this trial strategy it is not possible to compare the efficacy of the test product resp. reference product to an “untreated” control.

Against BREMLA no clear dose response was seen after two solo applications of Sunergist in both trials. Against RHIZSO weak dose response was seen in both trials, 0.4 l/ha (and 0.8 l/ha) performing best (severity assessments).

Regarding control of RHIZSO, in both trials Sunergist at 0.4 L/ha significantly increased the proportion of marketable heads, compared to the untreated control.
Against BREMLA (if statistics were provided) no significant difference was seen between the untreated control plots, and the test product. However, in one trial a numerical benefit was recorded:
Sunergist applied at 0.4 L/ha (equivalent to the dilution rate of 1:1000) showed a reduction (62 %, disease severity; 45 %, disease incidence) of *Bremia lactucae* on lettuce leaves. In the second trial negligible efficacy was recorded (21 % on severity, 3 % on incidence.)

Sunergist as part of a spray sequence (3 applications with conventional fungicides, followed by two treatments of Sunergist resp. a copper-based reference) achieved moderate to high levels of control against BREMLA (80 % resp. 41 % efficacy, disease severity resp. incidence), but was outperformed by the reference treatment. Against RHIZSO insufficient levels of control were recorded for both variants, and only the copper variant achieved a significant difference to the untreated control.

The applicant considers Sunergist used as elicitor to be a valuable tool for the suppression of *Bremia lactucae* (BREMLA) and *Thanatephorus cucumeris* (RHIZSO) on lettuce (LACSA), especially considering Integrated Pest Management (IPM) schemes.
At least numerically reduction of RHIZSO and BREMLA severity may be expected.

For product authorization, further data are needed to demonstrate an economically relevant benefit of the application as elicitor against BREMLA and RHIZSO on LACSA.

B.3.9.2.3. Control of *Cercospora beticola* (CERCBE) on sugar beet (BEAVA)

In order to prove the efficacy of 24-Epibrassinolide contained in Sunergist as elicitor against *Cercospora beticola* (CERCBE) on sugar beet (BEAVA) in the field, **one trial** was performed in Greece in 2015.
The reported trial was conducted by an officially recognized organization in accordance with the Principles of Good Experimental Practice (GEP) in the year 2015. The trial was performed under field conditions according to EPPO Guidelines EPPO PP 1/1 (4), PP 1/135(3), PP 1/152 (4), PP 1/181(4) and PP 1/225(2). No reference product was included in the trial.

Sunergist was applied twice as elicitor against *Cercospora beticola* in solo application (no other products with activity on *Cercospora beticola*) with a product rate of 0.50 ml/L (1:2000, 0.1 l product/ha); and in the rates of 0.25 mL/L (1:4000, 0.05 l product/ha), 0.50 ml/L (1:2000, 0.1 l product/ha) and 1.00 ml/L (1:1000, 0.2 l product/ha) in combined treatments with the late *Cercospora beticola* fungicide Score 25 EC (250 g a.s./l difenoconazol) applied at 0.5 L/ha (full protection).

Two applications were conducted by using a water volume of 200 l/ha.
The first application of Sunergist was performed at BBCH 13 and the second application was performed 14 days after first application at BBCH 16. The third application of Score 25 EC was carried out 42 days after the Sunergist treatments. The disease developed late, after the treatments with Sunergist. At the time of Score application, 1.5 % disease severity, and 26 % disease incidence were recorded on leaves, increasing up to 8 % resp. 71 % 10 days later (at the time of the final assessment). Results presented in the efficacy summary were not correct (interchanged). Therefore efficacy summary Table 6.2.3-3 was amended, and the pre-last assessment added:

Table B3.9.2.3-01: Minimum effective dose of Sunergist as elicitor for the reduction of *Cercospora beticola* on sugar beet (20 plants/plot)

Assessment day		**23.07.2015 (62 days after last application of Sunergist, 10 days after application of Score, if applied)**				**13.7.2015 (52 days after last application of Sunergist, 0 days after application of Score, if applied)**			
Assessment type		**% severity (efficacy)**		**% incidence (efficacy)**		**% severity (efficacy)**		**% incidence (efficacy)**	
Treatments	**Application rate (product)**								
Control(Untreated)		7.63	a	71.25	a	1.51	a	26.25	a
Sunergist SL (without Score)	**0.5 mL/L 0.1 L/ha (1:2000)**	**3.70 (51%)**	**b**	**53.75 (25%)**	**ab**	**0.7 (54%)**	**ab**	**30 (-14%)**	**a**
Sunergist SL + Score 25 EC	0.25 ml/L 0.05 l/ha (1:4000) + 0.5 L/ha	3.06 (60%)	b	43.75 (39%)	b	1.09 (28%)	ab	35 (-33%)	a
Sunergist SL + Score 25 EC	**0.5 ml/L 0.1 l/ha (1:2000) + 0.5 L/ha**	**2.73 (64%)**	**b**	**40.00 (44%)**	**b**	**0.89 (41%)**	**ab**	**27.5 (-5%)**	**a**
Sunergist SL + Score 25 EC	1 ml/L 0.2 l/ha (1:1000) + 0.5 l/ha	2.55 (67%)	b	36.25 (49%)	b	0.54 (64%)	b	23.75 (9.5 %)	a

Regarding disease severity, as well as disease incidence, no significant difference was recorded between the solo Sunergist application (2 times 0.1 l/ha), and the untreated control 52 days after the last application, however, a numerical benefit was seen for severity (54/41 % efficacy). 10 days later, a significant effect was seen on severity (51 % efficacy), and a small numerical benefit for incidence (25 % efficacy).
All treatments with a third application of Score performed better. A significant difference was seen in all cases for the test product treated objects, and the untreated control at the final assessment time. At 0.2 l/ha best performance was seen (67/49 % efficacy, on disease severity/incidence). Weak dose response was also seen.
Regarding the pre-last assessment (carried out at the time of Score application, thus an influence of Score on efficacy can be excluded), only Sunergist at 0.2 l/ha achieved a significant effect on disease severity (64 % efficacy). A numerical benefit was seen also for the next lower dose (41 % efficacy) No significant effect was recorded for disease incidence.

Conclusion: To demonstrate efficacy of Sunergist against CERCBE on BEAVA, a single GEP field trial (South zone, EPPO Mediterranean zone) was presented.

Sunergist was applied two times, either solely at (0.1 l/ha), or as part of a spray sequence (consisting of two sprays of the test product at 0.05 l/ha, 0.1 l/ha, 0.2 l/ha, followed 6 weeks later (at the time the disease started to evolve) by a third treatment with a *Cercospora*-active difenoconazol-based fungicide). Due to a pre-last assessment carried out before the azole was sprayed, efficacy of Sunergist without the influence of the azole was recorded for all trial objects, too.
At this pre-last assessment, weak dose response was seen. However, neither for severity, nor for incidence assessments, was a significant difference recorded between the solo Sunergist application (2 times 0.1 l/ha), and the untreated control. Only a numerical benefit was seen for severity.
Sunergist at 0.2 l/ha achieved a significant effect on disease severity (54/64 % efficacy), compared to the untreated control. A numerical benefit was seen also for the next lower dose of 0.1 l/ha (41 % efficacy). 10 days later, also at 0.1 l/ha a significant effect was seen on severity (51 % efficacy). No significant effect was recorded for disease incidence.

All treatments with a third application of Score performed better. A significant difference was seen in all cases between the test product treated objects, and the untreated control, at the final assessment time. At 0.2 l/ha best performance was seen (67/49 % efficacy, on disease severity/incidence). Weak dose response was also seen.

The applicant considers Sunergist used as elicitor to be a valuable tool for the suppression of *Cercospora beticola* (CERCBE) on sugar beet (BEAVA), especially considering Integrated Pest Management (IPM) schemes.
At least a numerically reduction of CERCBE severity may be expected.

For product registration, further data are needed to demonstrate an economically relevant benefit of the application as elicitor against CERCBE on BEAVA.

B.3.10. INFORMATION ON THE DEVELOPMENT OF RESISTANCE

Sunergist contains 0.01% (w/w) (equivalent to 0.099 g/L) of the nature-identical active substance 24-Epibrassinolide. 24-Epibrassinolide is a natural occurring elicitor of crop's self-defence mechanisms and a plant activator.

Due to the fact that 24-Epibrassinolide is known to act on cellular level by activating a cascade of biochemical reactions and protein-protein interactions resulting in activation and enhancement of the defense and immune system of plants, and that there is no direct fungicidal or antagonistic effect against harmful organisms, an occurrence of development of resistance against 24-Epibrassinolide contained in the product Sunergist is not to be expected.

Conclusion: No EPPO-conform resistance risk analysis was presented. Even though BOTRCI is a high risk target organism which has already developed resistance against several mode of action substance groups, the applicants rationale can be agreed: Resistance development is not to be expected, since Sunergist resp. 24-Epibrassinolide has no direct fungicidal effect. Thus baseline sensitivity data, as well as a detailed resistance risk analysis, can be waived.

B.3.11. ADVERSE EFFECTS ON TREATED CROPS

B.3.11.1. Phytotoxicity to target plants (including different cultivars), or to target plant products

No specific crop selectivity trials with Sunergist were conducted and submitted within the framework of this application. However, in none of the preliminary studies and efficacy trials phytotoxic symptoms were observed and reported.

VITVI (applied GAP is 3x 0.5 l/ha, spray volume 200-1000 l/ha, field use): In 5 preliminary non-GEP North American trials (deemed to be comparable to the EPPO Mediterranean zone) different dilution rates of 1:1893, 1:3785, 1:5735 were assessed. According to the applied spray volumes of 1400 l/ha, resp. 930 l/ha, doses of 0.24, 0.37, and 0.74 l/ha were applied.
In a Mediterranean zone GEP efficacy trial Sunergist was applied at 0.2, 0.4, and 0.8 l/ha (spray volume 600-800 l/ha). In 2 non-GEP efficacy trials (EPPO Maritime zone) doses of 0.23, resp. 0.31, 0.35, 0.40, 0.45 l/ha were assessed (Spray volumes 330 l/ha, resp. 451, 457, 818, 840 l/ha). In a third trial only the rate per ha (0.41 l/ha) was indicated.
No data from the EPPO South-east zone are available (EPPO North-east is not relevant for viticulture). Due to the applied spray volumes, it is supposed that in trials both the full canopy (1400 l/ha), and only the bunch zone (300 l/ha) were treated.

LACSA (applied GAP is 2 x 0.4 l/ha, spray volume 200-400 l/ha, field and greenhouse use): In two Maritime zone field trials Sunergist was applied two times, either solely at different doses (0.1/0.2/0.4 l/ha, resp. 0.2/0.4/0.8 l/ha), or additionally as part of a spray sequence. The applied spray volume was 400 l/ha in both trials.
No lower spray volumes were assessed, however, in one trial double the dose (0.6 l/ha) was applied too, corresponding if the target dose of 0.4 l/ha would have been applied in 200 l/ha.

BEAVA (applied GAP is 3 x 0.4 l/ha, spray volume 200-800 l/ha, field use):
In a single EPPO Mediterranean zone efficacy (GEP) trial doses of 0.05 l/ha, 0.1 l/ha, 0.2 l/ha were applied. Spray volume was 200 l/ha. Even though the applied dose was not assessed, due to the low spray volume, the recommended dilution rate of 1:2000 was assessed. No trials from other EPPO zones were available.

Conclusion: Crop safety was assessed on **VITVI** in the EPPO Mediterranean zone, and the EPPO Maritime zone. No data from the EPPO South-east zone are available (EPPO North-east is not relevant for viticulture). 24-Epibrassinolide is a phytohormone. Therefore, in particular in case of perennial crops such as VITVI, the possible effect on the crop after repeated application across several years should be assessed.

Crop safety was demonstrated for field-grown **LACSA**, in the EPPO Maritime zone only. No field trials conducted in other EPPO zones (South-east, North-East) are available. Sunergist was also not assessed on LACSA in the green house, and was not assessed on **cucurbits** at all (Plant activator use).
BEAVA was assessed in a single EPPO Mediterranean zone trial. No field trials conducted in other EPPO zones (Maritime, South-east, North-East) are available.

In none of the trials crop damage was reported. However, to sufficiently demonstrate crop safety of Sunergist at the applied doses and spray volumes for the Central zone, further data are needed (to be assessed on product level).

B.3.11.2. Effects on the yield of treated plants or plant products

In one Maritime zone wine grape non-GEP trial and one Mediterranean zone sugar beet GEP trial yield parameters of the plant product were evaluated.

In the wine grape study the yield was assessed in g/m². The application of Sunergist increased the yield compared to the untreated control in terms of numbers (depending on the grape variety + 7.2 %. + 15.3 %, + 43.2 %; statistics was not provided).
In the sugar beet trial GR-01-BEAVA the yield was assessed in kg/plot and t/ha. All rates of Sunergist increased the yield compared to the untreated control in terms of numbers (+ 12 %), however, not statistically significant.

Conclusion: Yield was assessed in one Maritime zone wine grape non-GEP trial and one Mediterranean zone sugar beet GEP trial. The application of Sunergist increased yield in terms of numbers. However, to confirm the positive effect of Sunergist on the yield, further product data are needed (to be assessed on zonal level).

B.3.11.3. Effects on the quality of plants or plant products

In four grapevine trials, thereof 3 non-GEP, **the influence on grape growth and health** was tested.
In the single GEP trial, and in one non-GEP trial, no differences in vigor were observed at any of the assessment timings.
In one non-GEP trial a tendency of increased vigor was recorded for one grape variety, and in one further non-GEP trial increased health was recorded on all sites. In the second year of this trial, on a single site 4 in 2016 statistically significant increase of plant health was observed, however for plants treated with Sunergist plus surfactant. The solo application of Sunergist (without surfactant) had no significant effect.

In four grape trials, thereof 3 non-GEP, and one sugar beet GEP-trial **quality parameters** were evaluated.

In the GEP grapevine trial, Sunergist treatments showed a slightly higher sugar content, measured as degree brix, in comparison to the untreated check. However, no significant difference was seen. The reference product significantly increased the sugar content. No effect on compactness or length of bunches, or bunch weight was seen.

In the non-GEP trials wine grape beery samples were analyzed for weight of berries, total solids, titratable acid and pH-value. In general, some effects on grape quality parameters could be observed but these changes were not present in all varieties.
In one trial the anthocyanin content in grape skin was additionally analyzed, and a tendency of increased anthocyanin content in grape skin could be observed.
In another non-GEP study sugar content and titratable acid were analyzed. These oenological parameters were slightly influenced by the application of Sunergist (decrease of sugar content 1-2 ° oechsle, increase *or* decrease of total acidity.

In the sugar beet GEP-trial sugar, Sodium (Na), Potassium (K) and protein content were assessed. Generally slightly differences between the quality parameters were measured.

Conclusion: In four grapevine trials, thereof 3 non-GEP, the influence on grape growth and health was tested.
In two trials (including the GEP-trial) no differences in vigor were observed at any of the assessment timings.

In the other two non-GEP trials a tendency of increased vigor was recorded for one grape variety, resp. increased health was recorded (with statistically significant increase of plant health on one site in one year), however for plants treated with Sunergist plus surfactant. The solo application of Sunergist (without surfactant) had no significant effect.
Regarding quality parameters of the yield, in two GEP-Trials (one grapevine, one sugar beet) slight and statistically insignificant differences between test product treated samples, and the untreated reference samples were seen. Also in non-GEP trials no constant adverse or positive effects were recorded.
No assessments of fresh fruits or vegetables (taint) were carried out.
Overall, the possible impact of Sunergist onto quality of the yield was not sufficiently supported. To confirm any positive effect of Sunergist, further product data are needed (to be assessed on zonal level).

B.3.11.4. Effects on transformation processes

No studies with regard to effects on transformation process were conducted. However, 24 Epibrassinolide is known to be present in several plants and plant organs, and was analyzed e.g. in seeds, roots, and leafs (0.22 - 378 µg/kg), as well as other natural and processed foods such as honey (7.4 µg/kg), fruit juices (0.5 - 12 µg/kg) and wine.
Due to this natural occurrence effects of the application of Sunergist according to the GAP on transformation processes are not to be expected.

Conclusion: Sunergist is applied in all crops for use without a PHI, therefore residues both of the active substance as well as of the formulation on the harvested parts of the plant have to be expected. No assessments of physically processed fruits or vegetables (taint) were carried out.
No direct effect onto pure yeasts resp. malolactic bacteria during microbial fermentation is expected, however, quality parameters of grape must, and thus also of wine, may be affected. To confirm the neutral behavior of Sunergist on processing resp. fermentation, further product data are needed (to be assessed on zonal level).

B.3.11.5. Impact on treated plants or plant products to be used for propagation

No negative impact on treated plants or plant products to be used for propagation has been reported.

Not relevant, since no uses in mother plantations or nurseries are intended.

B.3.12. Observations on other undesirable or unintended side-effects

B.3.12.1. Impact on succeeding crops

No phytotoxic effects according to EPPO Standard PP1/135 “Phytotoxicity assessment” have been observed in any of the efficacy trials. No impacts on the succeeding crops are known for Sunergist containing 24-Epibrassinolide as the active ingredient. Therefore no minimum interval has to be respected between the last application and the sowing of the following crop.

Conclusion: Crop safety was not sufficiently supported for all applied uses/crops. However, effects on succeeding crops usually are assessed for herbicides only.

B.3.12.2. Impact on other plants, including adjacent crops

No negative impact on other plants including adjacent crops has been reported.

Conclusion: In particular in high growing crops spray drift onto adjacent crops is possible. Crop safety was not sufficiently supported for all applied uses/crops. To confirm crop safety of Sunergist also for adjacent crops, further product data are needed (to be assessed on zonal level).

B.3.12.3. Impact on beneficial and other non-target organisms

No adverse effects of Sunergist on beneficial or other non-target organisms were reported in the trials. Details on the possible effects on beneficial organisms and other non-target organisms are submitted and summarized in B.9 (Ecotoxicology).

B.3.13. References relied on

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
MCP 3.1/010	Anonymous	2016	FRAC CODE LIST © 2016: FUNGICIDES SORTED BY MODE OF ACTION (INCLUDING FRAC CODE NUMBERING) Published: Yes GEP: No	N	N	-	public	no
KCP 6/01	Takatsuto, S. Abe, H. Gamoah, K.	1990	EVIDENCE FOR BRASSINOSTEROIDS IN STROBILUS OF EQUISETUM ARVENSE L. Doc. No.: 092-059 (Not applicable) Agricultural and Biological Chemistry, 1990, 54 (4), 1057-1059 Not GLP, published	N	N		nr	N
KCP 6/02	Zhu, J.-Y. Sae-Seaw, J. Wang, Z.-Y.	2013	BRASSINOSTEROID SIGNALLING Doc. No.: 092-165 (Not applicable) Development, 2013, 140(8), 1615-1620; doi: 10.1242/dev.060590 Not GLP, published	N	N		nr	N
KCP 6/03	Saini, S. Sharma, I. Pati, P.K.	2015	VERSATILE ROLES OF BRASSINOSTEROID IN PLANTS IN THE CONTEXT OF ITS HOMOEOSTASIS, SIGNALING AND CROSSTALKS Doc. No.: 092-182 (Not applicable) Frontiers in Plant Science, 2015, 6, 950; doi: 10.3389/fpls.2015.00950 Not GLP, published	N	N		nr	N
KCP 6/04	Symons, G.M. Ross, J.J. Jager, C.E. Reid, J.B.	2008	BRASSINOSTEROID TRANSPORT Doc. No.: 092-094 (Not applicable) Journal of Experimental Botany, 2008, 59 (1), 17-24; doi:10.1093/jxb/erm098 Not GLP, published	N	N		nr	N
KCP 6/05	Kutschera, U.	2012	BRASSINOSTEROID ACTION IN FLOWERING	N	N		nr	N

	Wang, Z.-Y.		PLANTS: A DARWINIAN PERSPECTIVE Doc. No.: 092-036 (Not applicable) Journal of Experimental Botany, 2012, 63 (10), 3511-3522; doi:10.1093/jxb/ers065 Not GLP, published					
KCP 6/06	Thompson, M.J. Mandava, N. Flippen-Anderson, J.L. Worley, J.F. Dutky, S.R. Robbins, W.E. Lusby, W.	1979	SYNTHESIS OF BRASSINO STEROIDS: NEW PLANT-GROWTH-PROMOTING STEROIDS Doc. No.: 092-063 (Not applicable) The Journal of Organic Chemistry, 1979, 44 (26), 5002-5004 Not GLP, published	N	N		nr	N
KCP 6/07	Ikekawa, N. Nishiyama, F. Fujimoto, Y.	1988	IDENTIFICATION OF 24-EPIBRASSINOLIDE IN BEE POLLEN OF THE BROAD BEAN, VICIA FABA L. Doc. No.: 092-027 (Not applicable) Chemical and Pharmaceutical Bulletin, 1988, 36 (1), 405-407 Not GLP, published	N	N		nr	N
KCP 6/08	Bajguz, A.	2011	SUPPRESSION OF CHLORELLA VULGARIS GROWTH BY CADMIUM, LEAD, AND COPPER STRESS AND ITS RESTORATION BY ENDOGENOUS BRASSINOLIDE Doc. No.: 092-103 (Not applicable) Archives of Environmental Contamination and Toxicology, 2011, 60, 406-416; DOI 10.1007/s00244-010-9551-0 Not GLP, published	N	N		nr	N
KCP 6/09	Khripach, V. Zhabinskii, V. De Groot, A.	2000	TWENTY YEARS OF BRASSINOSTEROIDS: STEROIDAL PLANT HORMONES WARRANT BETTER CROPS FOR THE XXI CENTURY Doc. No.: 092-029 (Not applicable) Annals of Botany, 2000, 86, 441-447; doi:10.1006/anbo.2000.1227	N	N		nr	N

			Not GLP, published					
KCP 6/10	Ikekawa, N. Zhao, Y.-J.	1991	APPLICATION OF 24-EPIBRASSINOLIDE IN AGRICULTURE Doc. No.: 092-026 (Not applicable) ACS Symposium series, 1991, 474, Chapter 24, 280-291 Not GLP, published	N	N		nr	N
KCP 6/11	Bajguz, A. Tretyn, A.	2003	THE CHEMICAL STRUCTURES AND OCCURRENCE OF BRASSINOSTEROIDS IN PLANTS Doc. No.: 092-145 (Not applicable) Brassinosteroids. Chapter 1, 2003, 1-44 Not GLP, published	N	N		nr	N
KCP 6/12	Hayat, s. Ahmad, A.	2011	BRASSINOSTEROIDS: A CLASS OF PLANT HORMONE Doc. No.: 092-146 (Not applicable) Springer Verlag, 2011, 1-477, DOI 10.1007/978-94-007-0189-2; ISBN: 978-94-007-0188-5 Not GLP, published	N	N		nr	N
KCP 6/13	Abe, H. Nakamura, K. Morishita, T. Uchiyama, M. Takatsuto, S. Ikekawa, N.	1984	ENDOGENOUS BRASSINOSTEROIDS OF THE RICE PLANT: CASTASTERONE AND DOLICHOSTERONE Doc. No.: 092-004 (Not applicable) Agricultural and Biological Chemistry, 1984, 48 (4), 1103-1104 Not GLP, published	N	N		nr	N
KCP 6/14	Abe, H. Takatsuto, S. Nakayama, M. Yokota, T.	1995	28-HOMOTYPHASTEROL, A NEW NATURAL BRASSINOSTEROID FROM RICE (ORYZA SATIVA L.) BRAN Doc. No.: 092-006 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1995, 59 (2), 176-178 Not GLP, published	N	N		nr	N
KCP 6/15	Park, K.-H. Park, J.-D. Hyun, K.-H. Nakayama, M. Yokota, T.	1994	BRASSINOSTEROIDS AND MONOGLYCERIDES IN IMMATURE SEEDS OF CASSIA TORA AS THE ACTIVE PRINCIPLES IN THE RICE LAMINA	N	N		nr	N

			INCLINATION BIOASSAY Doc. No.: 092-046 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1994, 58 (7), 1343-1344 Not GLP, published					
KCP 6/16	Khripach, V.A. Litvinovskaya, R.P. Kurtikova, A.L. Drach, S.V. Pryadko, A.G. Mirantsova, T.V. Baranovskiy, A.V.	2013	ENZYME IMMUNOASSAY OF THE CONTENT OF ENDOGENOUS BRASSINOSTEROIDS IN PHYTOGENIC FOOD PRODUCTS Doc. No.: 092-030 (Not applicable) National Academy of Sciences of Belarus, 2013, 57 (2), 63-69 Not GLP, published	N	N		nr	N
KCP 6/17	Yokota, T. Nakayama, M. Wakisaka, T. Schmidt, J. Adam, G.	1994	3-DEHYDROTEASTERONE, A 3,6-DIKETOBRASSINOSTEROID AS A POSSIBLE BIOSYNTHETIC INTERMEDIATE OF BRASSINOLIDE FROM WHEAT GRAIN Doc. No.: 092-078 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1994, 58 (6), 1183-1185 Not GLP, published	N	N		nr	N
KCP 6/18	Suzuki, Y. Yamaguchi, I. Yokota, T. Takahasi, N.	1986	IDENTIFICATION OF CASTASTERONE, TYPHASTEROL AND TEASTERONE FROM THE POLLEN OF ZEA MAYS Doc. No.: 092-053 (Not applicable) Agricultural and Biological Chemistry, 1986, 50 (12), 3133-3138 Not GLP, published	N	N		nr	N
KCP 6/19	Kim, S.-K. Chang, S.C. Lee, E.J. Chung, W.-S. Kim, Y.-S. Hwang, S. Lee, J.S.	2000	INVOLVEMENT OF BRASSINOSTEROIDS IN THE GRAVITROPIC RESPONSE OF PRIMARY ROOT OF MAIZE Doc. No.: 092-034 (Not applicable) Plant Physiology, 2000, 123, 997-1004 Not GLP, published	N	N		nr	N
KCP 6/20	Yasuta, E. Terahata, T.	1995	FREE AND CONJUGATED BRASSINOSTEROIDS IN	N	N		nr	N

	Nakayama, M. Abe, H. Takatsuto, S. Yokota, T.		THE POLLEN AND ANTHERS OF ERYTHRONIUM JAPONICUM DECNE Doc. No.: 092-067 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1995, 59 (11), 2156-2158 Not GLP, published					
KCP 6/21	Suzuki, H. Fujioka, S. Yokota, T. Murofushi, N. Sakurai, A.	1994	IDENTIFICATION OF BRASSINOLIDE, CASTASTERONE, TYPHASTEROL AND TEASTERONE FROM THE POLLEN OF LILIUM ELEGANS Doc. No.: 092-054 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1994, 58 (11), 2075-2076 Not GLP, published	N	N		nr	N
KCP 6/22	Abe, H. Honjo, C. Kyokawa, Y. Asakawa, S. Natsume, M. Narushima, M.	1994	3-OXOTEASTERONE AND THE EPIMERIZATION OF TEASTERONE: IDENTIFICATION IN LILY ANTHERS AND DISTYLIUM RACEMOSUM LEAVES AND ITS BIOTRANSFORMATION INTO TYPHASTEROL Doc. No.: 092-005 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1994, 58 (5), 986-989 Not GLP, published	N	N		nr	N
KCP 6/23	Asakawa, S. Abe. H. Kyokawa, Y. Nakamura, S. Natsume, M.	1994	TEASTERONE 3-MYRISTATE: A NEW TYPE OF BRASSINOSTEROID DERIVATIVE IN LILIUM LONGIFLORUM ANTHERS Doc. No.: 092-009 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1994, 58 (1), 219-220 Not GLP, published	N	N		nr	N
KCP 6/24	Asakawa, S. Abe, H. Nishikawa, N. Natsume, M.	1996	PURIFICATION AND IDENTIFICATION OF NEW ACYL-CONJUGATED TEASTERONES IN LILY POLLEN	N	N		nr	N

	Koshioka, M.		Doc. No.: 092-010 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1996, 60 (9), 1416-1420 Not GLP, published					
KCP 6/25	Soeno, K. Kyokawa, Y. Natsume, M. Abe, H.	2000	TEASTERONE-3-O-ß-D-GLUCOPYRANOSIDE, A NEW CONJUGATED BRASSINOSTEROID METABOLITE FROM LILY CELL SUSPENSION CULTURES AND ITS IDENTIFICATION IN LILY ANTHERS Doc. No.: 092-050 (Not applicable) Bioscience, Biotechnology and Biochemistry, 2000, 64 (4), 702-709 Not GLP, published	N	N		nr	N
KCP 6/26	Plattner, R.D. Taylor, S.L. Grove, M.D.	1986	DETECTION OF BRASSINOLIDE AND CASTASTERONE IN ALNUS GLUTINOSA (EUROPEAN ALDER) POLLEN BY MASS SPECTROMETRY/MASS SPECTROMETRY Doc. No.: 092-047 (Not applicable) Journal of Natural Products, 1986, 49 (3), 540-545 Not GLP, published	N	N		nr	N
KCP 6/27	Takatsuto, S. Abe, H. Yokota, T. Shimada, K. Gamoh, K.	1996	IDENTIFICATION OF CASTASTERONE AND TEASTERONE IN SEEDS OF CANNABIS SATIVA L. Doc. No.: 092-062 (Not applicable) Japan Oil Chemists' Society, 1996, 45 (9), 871-873 Not GLP, published	N	N		nr	N
KCP 6/28	Schmidt, J. Boehme, F. Adam, G.	1996	24-EPIBRASSINOLIDE FROM GYPSOPHILA PERFOLIATA Doc. No.: 092-049 (Not applicable) Zeitschrift für Naturforschung, 1996, 51 c, 897-899 Not GLP, published	N	N		nr	N
KCP 6/29	Yokota, T. Arima, M. Takahashi, N.	1982	CASTASTERONE, A NEW PHYTOSTEROL WITH PLANT-HORMONE POTENCY, FROM CHESTNUT INSECT GALL Doc. No.: 092-072 (Not	N	N		nr	N

			applicable) Tetrahedron letters, 1982, 23 (12), 1275-1278 Not GLP, published					
KCP 6/30	Ikeda, M. Takatsuto, S. Sassa, T. Ikekawa, N. Nukina, M.	1983	IDENTIFICATION OF BRASSINOLIDE AND ITS ANALOGUES IN CHESTNUT GALL TISSUE Doc. No.: 092-024 (Not applicable) Agricultural and Biological Chemistry, 1983, 47 (3), 655-657 Not GLP, published	N	N		nr	N
KCP 6/31	Ikekawa, N. Takatsuto, S.	1984	MICROANALYSIS OF BRASSIOSTEROIDS IN PLANTS BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY Doc. No.: 092-025 (Not applicable) Mass Spectroscopy, 1984, 32 (1), 55-70 Not GLP, published	N	N		nr	N
KCP 6/32	Asakawa, S. Abe. H. Kyokawa, Y. Nakamura, S. Natsume, M.	1994	TEASTERONE 3-MYRISTATE: A NEW TYPE OF BRASSINOSTEROID DERIVATIVE IN LILIUM LONGIFLORUM ANTHERS Doc. No.: 092-009 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1994, 58 (1), 219-220 Not GLP, published	N	N		nr	N
KCP 6/33	Arima, M. Yokota, T. Takahashi, N.	1984	IDENTIFICATION AND QUANTIFICATION OF BRASSINOLIDE-RELATED STEROIDS IN THE INSECT GALL AND HEALTHY TISSUES OF THE CHESTNUT PLANT Doc. No.: 092-008 (Not applicable) Phytochemistry, 1984, 23 (8), 1587-1591 Not GLP, published	N	N		nr	N
KCP 6/34	Takatsuto, S. Omote, K. Gamoh, K. Ishibashi, M.	1990	IDENTIFICATION OF BRASSINOLIDE AND CASTASTERONE IN BUCKWHEAT (FAGOPYRUM ESCULENTUM MOENCH) POLLEN Doc. No.: 092-060 (Not applicable)	N	N		nr	N

			Agricultural and Biological Chemistry, 1990, 54 (3), 757-762 Not GLP, published					
KCP 6/35	Sondhi, N. Bhardwaj, R. Kaur, S. Chandel, M. Kumar, N. Singh, B.	2010	INHIBITION OF H2O2-INDUCED DNA DAMAGE IN SINGLE CELL GEL ELECTROPHORESIS ASSAY (COMET ASSAY) BY CASTASTERONE ISOLATED FROM LEAVES OF CENTELLA ASIATICA Doc. No.: 092-155 (Not applicable) Health, 2010, 2 (6), 595-602; doi:10.4236/health.2010.26088 Not GLP, published	N	N		nr	N
KCP 6/36	Swaczynova, J. Novak, O. Hauserova, E. Fuksova, K. Sisa, M. Kohout, L. Strnad, M.	2007	NEW TECHNIQUES FOR THE ESTIMATION OF NATURALLY OCCURRING BRASSINOSTEROIDS Doc. No.: 092-057 (Not applicable) Journal of Plant Growth Regulation, 2007, 26, 1-14; DOI: 10.1007/s00344-006-0045-2 Not GLP, published	N	N		nr	N
KCP 6/37	Fujioka, S. Choi, Y.-H. Takatsuto, S. Yokota, T. Li, J. Chory, J. Sakurai, A.	1996	IDENTIFICATION OF CASTASTERONE, 6-DEOXOCASTASTERONE, TYPHASTEROL AND 6-DEOXOTYPHASTEROL FROM THE SHOOTS OF ARABIDOPSIS THALIANA Doc. No.: 092-018 (Not applicable) Plant & Cell Physiology, 1996, 37 (8), 1201-1203 Not GLP, published	N	N		nr	N
KCP 6/38	Fujioka, S. Li, J. Choi, Y.-H. Seto, H. Takatsuto, S. Noguchi, T. Watanabe, T. Kuriyama, H. Yokota, T. Chory, J. Sakurai, A.	1997	THE ARABIDOPSIS DEETIOLATED2 MUTATNT IS BLOCKED EARLY IN BRASSINOSTEROID BIOSYNTHESIS Doc. No.: 092-019 (Not applicable) The Plant Cell, 1997, 9, 1951-1962 Not GLP, published	N	N		nr	N
KCP	Nomura, T.	2001	ACCUMULATION OF 6-	N	N		nr	N

6/39	Sato, T. Bishop, G.J. Kamiya, Y. Takatsuto, S. Yokota, T.		DEOXOCATHASTERONE AND 6-DEOXOCASTASTERONE IN ARABIDOPSIS, PEA AND TOMATO IS SUGGESTIVE OF COMMON RATE-LIMITING STEPS IN BRASSINOSTEROID BIOSYNTHESIS Doc. No.: 092-040 (Not applicable) Phytochemistry, 2001, 57, 171-178 Not GLP, published					
KCP 6/40	Bancos, S. Nomura, T. Sato, T. Molnar, G. Bishop, G.J. Koncz, C. Yokota, T. Nagy, F. Szekeres, M.	2002	REGULATION OF TRANSCRIPT LEVELS OF THE ARABIDOPSIS CYTOCHROME P450 GENES INVOLVED IN BRASSINOSTEROID BIOSYNTHESIS Doc. No.: 092-161 (Not applicable) Plant Physiology, 2002, 130, 504-513; DOI: 10.1104/pp.005439 Not GLP, published	N	N		nr	N
KCP 6/41	Schmidt, J. Altmann, T. Adam, G.	1997	BRASSINOSTEROIDS FROM SEEDS OF ARABIDOPSIS THALIANA Doc. No.: 092-048 (Not applicable) Phytochemistry, 1997, 45 (7), 1325-1327 Not GLP, published	N	N		nr	N
KCP 6/42	Choe, S. Fujioka, S. Noguchi, T. Takatsuto, S. Yoshida, S. Feldmann, K.A.	2001	OVEREXPRESSION OF DWARF4 IN THE BRASSINOSTEROID BIOSYNTHETIC PATHWAY RESULTS IN INCREASED VEGETATIVE GROWTH AND SEE YIELD IN ARABIDOPSIS Doc. No.: 092-015 (Not applicable) The Plant Journal, 2001, 26 (6), 573-582 Not GLP, published	N	N		nr	N
KCP 6/43	Fujioka, S. Takatsuto, S. Yoshida, S.	2002	AN EARLY C-22 OXIDATION BRANCH IN THE BRASSINOSTEROID BIOSYNTHETIC PATHWAY Doc. No.: 092-020 (Not applicable) Plant Physiology, 2002, 130	N	N		nr	N

			(2), 930-939; doi/10.1104/pp.008722 Not GLP, published					
KCP 6/44	Shimada, Y. Goda, H. Nakamura, A. Takatsuto, S. Fujioka, S. Yoshida, S.	2003	ORGAN-SPECIFIC EXPRESSION OF BRASSINOSTEROID-BIOSYNTHETIC GENES AND DISTRIBUTION OF ENDOGENOUS BRASSINOSTEROIDS IN ARABIDOPSIS Doc. No.: 092-162 (Not applicable) Plant Physiology, 2003, 131, 287-297; DOI: 10.1104/pp.013029 Not GLP, published	N	N		nr	N
KCP 6/45	Abe, H. Morishita, T. Uchiyama, M. Marumo, S. Munakata, K. Takatsuto, S. Ikekawa, N.	1982	IDENTIFICATION OF BRASSINOLIDE-LIKE SUBSTANCES IN CHINESE CABBAGE Doc. No.: 092-002 (Not applicable) Agricultural and Biological Chemistry, 1982, 46 (10), 2609-2611 Not GLP, published	N	N		nr	N
KCP 6/46	Ikekawa, N. Takatsuto, S.	1984	MICROANALYSIS OF BRASSIOSTEROIDS IN PLANTS BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY Doc. No.: 092-025 (Not applicable) Mass Spectroscopy, 1984, 32 (1), 55-70 Not GLP, published	N	N		nr	N
KCP 6/47	Kanwar, M.K. Bhardwaj, R. Chowdhary, S.P. Arora, P. Sharma, P. Kumar, S.	2013	ISOLATION AND CHARACTERIZATION OF 24-EPIBRASSINOLIDE FROM BRASSICA JUNCEA L. AND ITS EFFECTS ON GROWTH, NI ION UPTAKE, ANTIOXIDANT DEFENSE OF BRASSICA PLANTS AND IN VITRO CYTOTOXICTY Doc. No.: 092-118 (Not applicable) Acta Physiologiae Plantarum, 2013, 35, 1351-1362; DOI 10.1007/s11738-012-1175-8 Not GLP, published	N	N		nr	N
KCP 6/48	Grove, M.D. Spencer,	1979	BRASSINOLIDE, A PLANT GROWTH-PROMOTING STEROID	N	N		nr	N

	G.F. Rohwedder, W.K. Mandava, N. Worley, J.F. Warthen, J.D. Steffens, G.L. Flippen-Anderson, J.L. Cook, J.C.		ISOLATED FROM BRASSICA NAPUS POLLEN Doc. No.: 092-022 (Not applicable) Nature, 1979, 281, 216-217 Not GLP, published					
KCP 6/49	Pan, J. Hu, Y. Liang, T. Li, G.	2012	PREPARATION OF SOLID-PHASE MICROEXTRACTION FIBERS BY IN-MOLD COATING STRATEGY FOR DERIVATIZATION ANALYSIS OF 24-EPIBRASSINOLIDE IN POLLEN SAMPLES Doc. No.: 092-041 (Not applicable) Journal oh Chromatography A, 2012, 1262, 49-55; doi: 10.1016/j.chroma.2012.09.008 Not GLP, published	N	N		nr	N
KCP 6/50	Baba, J. Yokota, T. Takahashi, N.	1983	BRASSINOLIDE-RELATED NEW BIOACTIVE STEROIDS FROM DOLICHOS LABLAB SEED Doc. No.: 092-011 (Not applicable) Agricultural and Biological Chemistry, 1983, 47 (3), 659-661 Not GLP, published	N	N		nr	N
KCP 6/51	Yokota, T. Baba, J. Takahashi, N.	1983	BRASSINOLIDE-RELATED BIOACTIVE STEROLS IN DOLICHOS LABLAB: BRASSINOLIDE, CASTASTERONE AND A NEW ANALOG HOMODOLICHOLIDE Doc. No.: 092-073 (Not applicable) Agricultural and Biological Chemistry, 1983, 47 (6), 1409-1411 Not GLP, published	N	N		nr	N
KCP 6/52	Yokota, T. Baba, J. Koba, S.	1984	PURIFICATION AND SEPARATION OF EIGHT STEROIDAL PLANT-	N	N		nr	N

	Takahashi, N.		GROWTH REGULATORS FROM DOLICHOS LABLAB SEED Doc. No.: 092-075 (Not applicable) Agricultural and Biological Chemistry, 1984, 48 (10), 2529-2534 Not GLP, published					
KCP 6/53	Abe, H. Takatsuto, S. Okuda, R. Yokota, T.	1995	IDENTIFICATION OF CASTASTERONE, 6-DEOXOCASTASTERONE, AND TYPHASTEROL IN THE POLLEN OF ROBINIA PSEUDO-ACACIA L. Doc. No.: 092-007 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1995, 59 (2), 309-310 Not GLP, published	N	N		nr	N
KCP 6/54	Park, K.-H. Yokota, T. Sakurai, A. Takahashi, N.	1987	OCCURRENCE OF CASTASTERONE, BRASSINOLIDE AND METHYL 4-CHLOROINDOLE-3-ACETATE IN IMMATURE VICIA FABA SEEDS Doc. No.: 092-044 (Not applicable) Agricultural and Biological Chemistry, 1987, 51 (11), 3081-3086 Not GLP, published	N	N		nr	N
KCP 6/55	Yokota, T. Morita, M. Takahashi, N.	1983	6-DEOXOCASTASTERONE AND 6-DEOXODOLICHOSTERONE: PUTATIVE PRECURSORS FOR BRASSINOLIDE-RELATED STEROIDS FROM PHASEOLUS VULGARIS Doc. No.: 092-074 (Not applicable) Agricultural and Biological Chemistry, 1983, 47 (9), 2149-2151 Not GLP, published	N	N		nr	N
KCP 6/56	Yokota, T. Koba, S. Kim, S.K. Takatsuto, S. Ikekawa, N. Sakakibara, M.	1987	DIVERSE STRUCTURAL VARIATIONS OF THE BRASSINOSTEROIDS IN PHASEOLUS VULGARIS SEED Doc. No.: 092-076 (Not applicable) Agricultural and Biological	N	N		nr	N

	Okada, K. Mori, K. Takahashi, N.		Chemistry, 1987, 51 (6), 1625-1631 Not GLP, published					
KCP 6/57	Kim, S.-K. Yokota, T. Takahashi, N.	1987	25-METHYLDOLICHOSTERONE, A NEW BRASSINOSTEROID WITH A TERTIARY BUTYL GROUP FROM IMMATURE SEED OF PHASEOLUS VULGARIS Doc. No.: 092-032 (Not applicable) Agricultural and Biological Chemistry, 1987, 51 (8), 2303-2305 Not GLP, published	N	N		nr	N
KCP 6/58	Kim, T.-W. Park, S.-H. Han, K.-S. Choo, J. Lee, J.S. Hwang, S. Kim, S.-K.	2000	OCCURRENCE OF TEASTERONE AND TYPHASTEROL, AND THEIR ENZYMATIC CONVERSION IN PHASEOLUS VULGARIS Doc. No.: 092-035 (Not applicable) Bulletin-Korean Chemical Society, 2000, 21 (4), 373-374 Not GLP, published	N	N		nr	N
KCP 6/59	Kim, S.-K.	1991	NATURAL OCCURRENCES OF BRASSINOSTEROIDS Doc. No.: 092-033 (Not applicable) ACS Symposium series, 1991, 474, Chapter 3, 26-35 Not GLP, published	N	N		nr	N
KCP 6/60	Park, S.C. Kim, T.-W. Kim, S.-K.	2000	IDENTIFICATION OF BRASSINOSTEROIDS WITH 24R-METHYL IN IMMATURE SEEDS OF PHASEOLUS VULGARIS Doc. No.: 092-043 (Not applicable) Bulletin-Korean Chemical Society, 2000, 21 (12), 1274-1276 Not GLP, published	N	N		nr	N
KCP 6/61	Nomura, T. Nakayama, M. Reid, J.B. Takeuchi, Y. Yokota, T.	1997	BLOCKAGE OF BRASSINOSTEROID BIOSYNTHESIS AND SENSITIVITY CAUSES DWARFISM IN GARDEN PEA Doc. No.: 092-038 (Not applicable) Plant Physiology, 1997, 113, 31-37	N	N		nr	N

			Not GLP, published					
KCP 6/62	Nomura, T. Kitasaka, Y. Takatsuto, S. Reid, J.B. Fukami, M. Yokota, T.	1999	BRASSINOSTEROID/STEROL SYNTHESIS AND PLANT GROWTH AS AFFECTED BY IKA AND IKB MUTATIONS OF PEA Doc. No.: 092-039 (Not applicable) Plant Physiology, 1999, 119, 1517-1527 Not GLP, published	N	N		nr	N
KCP 6/63	Sondhi, N. Bhardwaj, R. Kaur, S. Kumar, N. Singh, B.	2008	ISOLATION OF 24-EPIBRASSINOLIDE FROM LEAVES OF AEGLE MARMELOS AND EVALUATION OF ITS ANTIGENOTOXITIY EMPLOYING ALLIUM CEPA CHROMOSOMAL ABERRATION ASSAY Doc. No.: 092-154 (Not applicable) Plant Growth Regulation, 2008, 54, 217-224; DOI: 10.1007/s10725-007-9242-7 Not GLP, published	N	N		nr	N
KCP 6/64	Motegi, C. Takatsuto, S.	1994	IDENTIFICATION OF BRASSINOLIDE AND CASTASTERONE IN THE POLLEN OF ORANGE (CITRUS SINENSIS OSBECK) BY HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY Doc. No.: 092-037 (Not applicable) Journal of Chromatography A, 1994, 658, 27-30 Not GLP, published	N	N		nr	N
KCP 6/65	Abe, H. Morishita, T. Uchiyama, M. Takatsuto, S. Ikekawa, N.	1984	A NEW BRASSINOLIDE-RELATED STEROID IN THE LEAVES OF THEA SINENSIS Doc. No.: 092-003 (Not applicable) Agricultural and Biological Chemistry, 1984, 48 (8), 2171-2172 Not GLP, published	N	N		nr	N
KCP 6/66	Gupta, D. Bhardwaj, R. Nagar, P.K. Kaur, S.	2004	ISOLATION AND CHARACTERIZATION OF BRASSINOSTEROIDS FROM LEAVES OF CAMELLIA SINENSIS (L.) O. KUNTZE Doc. No.: 092-153 (Not applicable) Plant Growth Regulation, 2004, 43, 97-100	N	N		nr	N

			Not GLP, published					
KCP 6/67	Choi, Y.-H. Inoue, T. Fujioka, S. Saimoto, H. Sakurai, A.	1993	IDENTIFICATION OF BRASSINOSTEROID-LIKE ACTIVE STUBSTANCES IN PLANT-CELL CULTURES Doc. No.: 092-016 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1993, 57 (5), 860-861 Not GLP, published	N	N		nr	N
KCP 6/68	Fujioka, S. Inoue, T. Takatsuto, S. Yanagisawa, T. Yokota, T. Sakurai, A.	1995	IDENTIFICATION OF A NEW BRASSINOSTEROID, CATHASTERONE, IN CULTURED CELLS OF CATHARANTHUS ROSEUS AS A BIOSYNTHETIC PRECURSOR OF TEASTERONE Doc. No.: 092-017 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1995, 59 (8), 1543-1547 Not GLP, published	N	N		nr	N
KCP 6/69	Park, K.-H. Saimoto, H. Nakagawa, S. Sakurai, A. Yokota, T. Takahashi, N. Syono, K.	1989	OCCURRENCE OF BRASSINOLIDE AND CASTASTERONE IN CROWN GALL CELLS OF CATHARANTHUS ROSEUS Doc. No.: 092-045 (Not applicable) Agricultural and Biological Chemistry, 1989, 53 (3), 805-811 Not GLP, published	N	N		nr	N
KCP 6/70	Suzuki, H. Fujioka, S. Takatsuto, S. Yokota, T. Murofushi, N. Sakurai, A.	1995	BIOSYNTHESIS OF BRASSINOSTEROIDS IN SEEDLINGS OF CATHARANTHUS ROSEUS, NICOTIANA TABACUM, AND ORYZA SATIVA Doc. No.: 092-056 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1995, 59 (2), 168-172 Not GLP, published	N	N		nr	N
KCP 6/71	Yokota, T. Ogino, Y. Takahashi, N. Saimoto, H. Fujioka, S.	1990	BRASSINOLIDE IS BIOSYNTHESIZED FROM CASTASTERONE IN CATHARANTHUS ROSEUS CROWN GALL CELLS	N	N		nr	N

	Sakurai, A.		Doc. No.: 092-077 (Not applicable) Agricultural and Biological Chemistry, 1990, 54 (4), 1107-1108 Not GLP, published					
KCP 6/72	Takatsuto, S. Yokota, T. Omote, K. Gamor, K. Takahashi, N.	1989	IDENTIFICATION OF BRASSINOLIDE, CASTASTERONE AND NORCASTASTERONE (BRASSINONE) IN SUNFLOWER (HELIANTHUS ANNUUS L.) POLLEN Doc. No.: 092-058 (Not applicable) Agricultural and Biological Chemistry, 1989, 53 (8), 2177-2180 Not GLP, published	N	N		nr	N
KCP 6/73	Yamamoto, R. Fujioka, S. Demura, T. Takatsuto, S. Yoshida, S. Fukuda, H.	2001	BRASSINOSTEROID LEVELS INCREASE DRASTICALLY PRIOR TO MORPHOGENESIS OF TRACHEARY ELEMENTS Doc. No.: 092-066 (Not applicable) Plant Physiology, 2001, 125, 556-563 Not GLP, published	N	N		nr	N
KCP 6/74	Suzuki, Y. Yamaguchi, I. Takahasi, N.	1985	IDENTIFICATION OF CASTASTERONE AND BRASSINONE FROM IMMATURE SEEDS OF PHARBITIS PURPUREA Doc. No.: 092-052 (Not applicable) Agricultural and Biological Chemistry, 1985, 49 (1), 49-54 Not GLP, published	N	N		nr	N
KCP 6/75	Jang, M.-S. Han, K.-S. Kim, S.-K.	2000	IDENTIFICATION OF BRASSINOSTEROIDS AND THEIR BIOSYNTHETIC PRECURSORS FROM SEEDS OF PUMPKIN Doc. No.: 092-028 (Not applicable) Bulletin-Korean Chemical Society, 2000, 21 (2), 161-164 Not GLP, published	N	N		nr	N
KCP 6/76	Tripathi, S. Sharma, P.	2015	CHARACTERIZATION OF BRASSINOSTEROID ISOLATED FROM BACOPA MONNIERI L. AND THEIR FREE RADICAL SCAVENGING	N	N		nr	N

			ACTIVITY Doc. No.: 092-156 (Not applicable) International Journal of Science and Research (IJSR), 2015, 4 (4), 2738-2742 Not GLP, published					
KCP 6/77	Yokota, T. Nomura, T. Nakayama, M.	1997	IDENTIFICATION OF BRASSINOSTEROIDS THAT APPEAR TO BE DERIVED FROM CAMPESTEROL AND CHOLESTEROL IN TOMATO SHOOTS Doc. No.: 092-070 (Not applicable) Plant & Cell Physiology, 1997, 38 (11), 1291-1294 Not GLP, published	N	N		nr	N
KCP 6/78	Bishop, G.J. Nomura, T. Yokota, T. Harrison, k. Noguchi, T. Fujioka, S. Takatsuto, S. Jones, J.D.G. Kamiya, Y.	1999	THE TOMATO DWARF ENZYME CATALYSES C-6 OXIDATION IN BRASSINOSTEROID BIOSYNTHESIS Doc. No.: 092-014 (Not applicable) Proceedings of the National Academy of Sciences, 1999, 96, 1761-1766 Not GLP, published	N	N		nr	N
KCP 6/79	Griffiths, P.G. Sasse, J.M. Yokota, T. Cameron, D.W.	1995	6-DEOXOTYPHASTEROL AND 3-DEHYDRO-6-DEOXOTEASTERONE, POSSIBLE PRECURSORS TO BRASSINOSTEROIDS IN THE POLLEN OF CUPRESSUS ARIZONICA Doc. No.: 092-021 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1995, 59 (5), 956-959 Not GLP, published	N	N		nr	N
KCP 6/80	Takatsuto, S. Abe, H. Shimada, K. Nakayama, M. Yokota, T.	1996	IDENTIFICATION OF TEASTERONE AND 4-DESMETHYLSTEROLS IN THE SEEDS OF GINKGO BILOBA L. Doc. No.: 092-061 (Not applicable) Japan Oil Chemists' Society, 1996, 45 (12), 1349-1351 Not GLP, published	N	N		nr	N
KCP 6/81	Kim, S.-K. Abe, H. Anthony Little, C.H. Pharis, R.P.	1990	IDENTIFICATION OF TWO BRASSINOSTEROIDS FROM THE CAMBIAL REGION OF SCOTS PINE	N	N		nr	N

			(PINUS SILVERSTRIS) BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY, AFTER DETECTION USING A DWARF RICE LAMINA INCLINATION BIOASSAY Doc. No.: 092-031 (Not applicable) Plant Physiology, 1990, 94, 1709-1713 Not GLP, published					
KCP 6/82	Yokota, T. Arima, M. Takahashi, N. Takatsuto, S. Ikekawa, N. Takematsu, T.	1983	2-DEOXYCASTASTERONE, A NEW BRASSINOLIDE-RELATED BIOACTIVE STEROID FROM PINUS POLLEN Doc. No.: 092-071 (Not applicable) Agricultural and Biological Chemistry, 1983, 47 (10), 2419-2420 Not GLP, published	N	N		nr	N
KCP 6/83	Yokota, T. Higuchi, K. Takahashi, N. Kamuro, Y. Watanabe, T. Takatsuto, S.	1998	IDENTIFICATION OF BRASSINOSTEROIDS WITH EPIMERIZED SUBSTITUENTS AND / OR THE 23-OXO GROUP IN POLLEN AND ANTHERS OF JAPANESE CEDAR Doc. No.: 092-068 (Not applicable) Bioscience, Biotechnology and Biochemistry, 1998, 62 (3), 526-531 Not GLP, published	N	N		nr	N
KCP 6/84	Watanabe, T. Yokota, T. Shibata, K. Nomura, T. Seto, H. Takatsuto, S.	2000	CRYPTOLIDE, A NEW BRASSINOLIDE CATABOLITE WITH A 23-OXO GROUP FROM JAPANESE CEDAR POLLEN/ANTHER AND ITS SYNTHESIS Doc. No.: 092-065 (Not applicable) Journal of Chemical Research (S), 2000, 18-19 Not GLP, published	N	N		nr	N
KCP 6/85	Park, S.-H. Han, K.-S. Kim, T.-W. Shim, J.-K. Takatsuto, S. Yokota, T. Kim, S.-K.	1999	IN VIVO AND IN VITRO CONVERSION OF TEASTERONE TO TYPHASTEROL IN CULTURED CELLS OF MARCHANTIA POLYMORPHA Doc. No.: 092-042 (Not	N	N		nr	N

			applicable) Plant & Cell Physiology, 1999, 40 (9), 955-960 Not GLP, published					
KCP 6/86	Yokota, T. Ohnishi, T. Shibata, K. Asahina, M. Nomura, T. Fujita, T. Ishizaki, K. Kohchi, T.	2017	OCCURRENCE OF BRASSINOSTEROIDS IN NON-FLOWERING LAND PLANTS, LIVERWORT, MOSS, LYCOPHYTE AND FERN Doc. No.: 092-069 (Not applicable) Phytochemistry, 2017, xxx, 1-10; doi: 10.1016/j.phytochem.2016.12.020 Not GLP, published	N	N		nr	N
KCP 6/87	Stirk, W.A. Balint, P. Tarkowska, D. Novak, O. Strnad, M. Oerdoeg, V. van Staden, J.	2013	HORMONE PROFILES IN MICROALGAE: GIBBERELLINS AND BRASSINOSTEROIDS Doc. No.: 092-051 (Not applicable) Plant Physiology and Biochemistry, 2013, 70, 348-353; doi: 10.1016/j.plaphy.2013.05.037 Not GLP, published	N	N		nr	N
KCP 6/88	Bajguz, A.	2009	ISOLATION AND CHARACTERIZATION OF BRASSINOSTEROIDS FROM ALGAL CULTURES OF CHLORELLA VULGARIS BEIJERINCK (TREBOUXIOPHYCEAE) Doc. No.: 092-013 (Not applicable) Journal of Plant Physiology, 2009, 166, 1946-1949; doi:10.1016/j.jplph.2009.05.003 Not GLP, published	N	N		nr	N
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KCP 6/90	Tsavkelova, E.A.	2006	HORMONES AND HORMONE-LIKE	N	N		nr	N

	Klimova, S.Y. Cherdyntseva, T.A. Netrusov, A.I.		SUBSTANCES OF MICROORGANISMS: A REVIEW Doc. No.: 092-064 (Not applicable) Applied Biochemistry and Microbiology, 2006, 42 (3), 229-235 Not GLP, published					
KCP 6/91	Bajguz, A. Hayat, S.	2009	EFFECTS OF BRASSINOSTEROIDS ON THE PLANT RESPONSES TO ENVIRONMENTAL STRESSES Doc. No.: 092-133 (Not applicable) Plant Physiology and Biochemistry, 2009, 47, 1-8; doi:10.1016/j.plaphy.2008.10.002 Not GLP, published	N	N		nr	N
KCP 6/92	Eremina, M. Unterholzner, S.J. Rathnayake, A.I. Castellanos, M. Khan, M. Kugler, K.G. May, S.T. Mayer, K.F.X. Rozhon, W. Poppenberger, B.	2016	BRASSINOSTEROIDS PARTICIPATE IN THE CONTROL OF BASAL AND ACQUIRED FREEZING TOLERANCE OF PLANTS Doc. No.: 092-136 (Not applicable) Proceedings of the National Academy of Sciences, 2016, 113 (40), E5982-E5991 Not GLP, published	N	N		nr	N
KCP 6/93	Aremu, A.O. Stirk, W.A. Kulkarni, M.G. Tarkowska, D. Tureckova, V. Gruz, J. Subrtova, M. Pencik, A. Novak, O. Dolezal, K. Strnad, M. Van Staden, J.	2015	EVIDENCE OF PHYTOHORMONES AND PHENOLIC ACIDS VARIABILITY IN GARDEN-WASTE-DERIVED VERMICOMPOST LEACHATE, A WELL-KNOWN PLANT GROWTH STIMULANT Doc. No.: 092-158 (Not applicable) Plant Growth Regulation, 2015, 75 (2), 483-492; DOI: 10.1007/s10725-014-0011-0 Not GLP, published	N	N		nr	N
KCP 6/94	Badri, D.V. Vivanco, J.M.	2009	REGULATION AND FUNCTION OF ROOT EXUDATES Doc. No.: 092-012 (Not	N	N		nr	N

			applicable) Plant, Cell and Environment, 2009, 32, 666-681; doi: 10.1111/j.1365-3040.2009.01926.x Not GLP, published					
KCP 6/95	Hassett, J.P. Fred Lee, G. Lee, F.G.	1977	STEROLS IN NATURAL WATER AND SEDIMENT Doc. No.: 092-168 (Not applicable) Water Research, 1977, 11, 983-989 Not GLP, published	N	N		nr	N
KCP 6/96	Mudge, S.M. Joao A.F. Bebianno, M. East, J.A. Barreira, L.A.	1999	STEROLS IN THE RIA FORMOSA LAGOON, PORTUGAL Doc. No.: 092-169 (Not applicable) Water Research, 1999, 33 (4), 1038-1048 Not GLP, published	N	N		nr	N
KCP 6/97	Nishikawa, N. Toyama, S. Shida, A. Futatsuya, F.	1994	THE UPTAKE AND THE TRANSPORT OF 14C-LABELED EPIBRASSINOLIDE IN INTACT SEEDLINGS OF CUCUMBER AND WHEAT Doc. No.: 092-088 (Not applicable) Journal of Plant Research, 1994, 107, 125-130 Not GLP, published	N	N		nr	N
KCP 6/98	Mekhalfi, M. Avilan, L. Lebrun, R. Botebol, H. Gontero, B.	2012	CONSEQUENCES OF THE PRESENCE OF 24-EPIBRASSINOLIDE, ON CULTURES OF A DIATOM, ASTERIONELLA FORMOSA Doc. No.: 092-109 (Not applicable) Biochimie, 2012, 94, 1213-1220; doi: 10.1016/j.biochi.2012.02.011 Not GLP, published	N	N		nr	N
KCP 6/99	Vorbrodt, H.-M. Adam, G. Porzel, A. Hoerhold, C. Daenhardt, S. Boehme, K.-H.	1991	MICROBIAL DEGRADATION OF 2 ALPHA, 3 ALPHA-DIHYDROXY-5 ALPHA-CHOLESTAN-6-ONE BY MYCOBACTERIUM VACCAE Doc. No.: 092-157 (Not applicable) Steroids, 1991, 56, 586-588 Not GLP, published	N	N		nr	N
KCP	Voigt, B.	1993	HYDROXYLATION OF	N	N		nr	N

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KCP 6/101	Saygideger, S. Deniz, F.	2008	EFFECT OF 24-EPIBRASSINOLIDE ON BIOMASS, GROWTH AND FREE PROLINE CONCENTRATION IN SPIRULINA PLATENSIS (CYNOPHYTA) UNDER NaCl STRESS Doc. No.: 092-176 (Not applicable) Plant Growth Regulation, 2008, 56, 219-223; DOI: 10.1007/s10725-008-9310-7 Not GLP, published	N	N		nr	N
KCP 6/102	Asari, S. Tarkowska, D. Rolcik, J. Novak, O. Palmero, D.V. Bejai, S. Meijer, J.	2017	ANALYSIS OF PLANT GROWTH-PROMOTING PROPERTIES OF BACILLUS AMYLOLIQUEFACIENS UCMB5113 USING ARABIDOPSIS THALIANA AS HOST PLANT Doc. No.: 092-181 (Not applicable) Planta, 2017, 245, 15-30; DOI: 10.1007/s00425-016-2580-9 Not GLP, published	N	N		nr	N
KCP 6/103	Anonymous	2017	EFFICACY INFORMATION CONCISE SUMMARY - SUNERGIST (0.01% (w/w) 24-EPIBRASSINOLIDE) Doc. No.: 381-002 (Not indicated) Not GLP, unpublished	N	Y	New study necessary for the approval of 24-Epibrassinolide	Suntton GmbH	N
KCP 6.1/01	Beem, L.W.	2015	TO DETERMINE THE EFFECTS OF EPI-BRASSINOLE ON TABLE GRAPE BUNCH WEIGHT AND COUNTS - USA 2015 (TRIAL NO: BASC-SUN-15-GRAP-06) Beem Consulting, Granite Bay, Northern California, USA Rep. Nr. BASC-SUN-15-	No	N	No	Suntton GmbH	no

			GRAP-06 BEEM-EPI-TAB-GRAP-2015 (332-40007) Published: No GLP/GEP: No					
KCP 6.1/02	Beem, L.W.	2015	TO DETERMINE THE EFFECTS OF EPI-BRASSINOLE ON TABLE GRAPE BUNCH WEIGHT AND COUNTS - USA 2015 (TRIAL NO: BASC-SUN-15-SCARLETT 03C) Beem Consulting, Granite Bay, Northern California, USA Rep. Nr. BASC-SUN-15-SCARLETT 03C BEEM-EPI-TAB-GRAP-2015 (332-40006) Published: No GLP/GEP: No	N	N		Suntton GmbH	no
KCP 6.1/03	Beem, L.W.	2015	TO DETERMINE THE EFFECTS OF EPI-BRASSINOLE ON TABLE GRAPE BUNCH WEIGHT AND COUNTS - USA 2015 (TRIAL NO: BASC-SUN-15-CRIMSON 02B) Beem Consulting, Granite Bay, Northern California, USA Rep. Nr. BASC-SUN-15-CRIMSON 02B BEEM-EPI-TAB-GRAP-2015 (332-40008) Published: No GLP/GEP: No	N	N		Suntton GmbH	no
KCP 6.1/04	Beem, L.W.	2015	TO DETERMINE THE EFFECTS OF EPI-BRASSINOLE 0.01% ON WINE GRAPE BUNCH COLOR, WEIGHT, BRIX - USA 2015 (TRIAL NO: BASC-SUN-15-WIN-GRAP-07) Beem Consulting, Granite Bay, Northern California, USA Rep. Nr. BASC-SUN-15-WIN-GRAP-07 BEEM-EPI-WIN-GRAP-2015 (332-40004) Published: No GLP/GEP: No	N	N		Suntton GmbH	no
KCP	Beem, L.W.	2015	TO DETERMINE THE	N	N		Suntto	no

6.1/05			EFFECTS OF EPI-BRASSINOLE ON WINE GRAPE FRUIT SET, SIZING, MATURITY ETC - USA 2015 (TRIAL NO: BASC-SUN-15-WIN-GRAP-08) Beem Consulting, Granite Bay, Northern California, USA Rep. Nr. BASC-SUN-15-WIN-GRAP-08 BEEM-EPI-WIN-GRAP-2015 (332-40005) Published: No GLP/GEP: No				n GmbH	
KCP 6.1/06	Xi, Z.M. Zhang, Z.W. Huo, S.S. Luan, L.Y. Gao, X. Ma, L.N. Fang, Y.L.	2013	REGULATING THE SECONDARY METABOLISM IN GRAPE BERRY USING EXOGENOUS 24-EPIBRASSINOLIDE FOR ENHANCED PHENOLICS CONTENT AND ANTIOXIDANT CAPACITY Rep. Nr. n.i. ((092-178) GLP/GEP: No Published: yes	N	N		public	no
KCP 6.2/01	Gerling, C.	2015	EFFICACY OF SUNERGIST SL (0.01% BRASSINOLIDE) - FIELD TEST ON TABLE GRAPES - SPAIN 2015 SGS Institut Fresenius GmbH, Taunusstein, Germany Rep. Nr. PP309-00002-EFF-TG-ES-01 (332-40001) Published: No GEP: Yes	N	Y		Suntto n GmbH	no
KCP 6.2/02	Forneck, A. Griesser, M.	2017	SUNERGIST SL (0.01% BRASSINOLIDE) - V. VINIFERA "ZWEIGELT" - AUSTRIA 2015 University of Natural Resources and Life Sciences, Vienna, Austria Rep. Nr. PP309-00002 (332-40002) Published: No GLP/GEP: No	N	N		Suntto n GmbH	no
KCP 6.2/03	Forneck, A. Griesser, M.	2017	SUNERGIST SL (0.01% BRASSINOLIDE) - V. VINIFERA "WEISSBURGUNDER", "BLAUER ZWEIGELT",	N	N		Suntto n GmbH	no

			"GRUENER VELTLINER" - AUSTRIA 2016 University of Natural Resources and Life Sciences, Vienna, Austria Rep. Nr. PP309-00002 (332-40003) Published: No GEP/GLP: No					
KCP 6.2/04	Forneck, A.	2017	INFLUENCE OF THE PLANT STRENGTHENER SUNTTON® (= SUNERGIST®)) ON THE HEALTH OF VINE GRAPES IN GERMANY IN 2015 AND 2016 Universitäts- und Forschungszentrum Tulln, Austria Rep. Nr. ni (332-40009) Published: No GEP/GLP: No	N	N		Suntto n GmbH	no
KCP 6.2/05	Weinheimer , S.	2015	TRIAL PROTOCOL - LETTUCE - RHIZOCTONIA SOLANI AND DOWNY MILDEW - GERMANY 2015 DLR - Rheinpfalz, Neustadt a.d.Wstr., Germany Rep. Nr. ni (333-42001) Published: No GEP/GLP: Yes	N	Y		Suntto n GmbH	no
KCP 6.2/06	Weinheimer , S.	2016	TRIAL PROTOCOL - LETTUCE - RHIZOCTONIA SOLANI AND DOWNY MILDEW - GERMANY 2016 DLR - Rheinpfalz, Neustadt a.d.Wstr., Germany Rep. Nr. ni (333-42002) Published: No GEP/GLP: Yes	N	Y		Suntto n GmbH	no
KCP 6.2/07	Tatsis, S.	2016	SUNERGIST SL (0.01% BRASSINOLIDE - FIELD TEST ON SUGAR BEET - GREECE 2015 (TRIAL NO: PP309-00002-EFF-SB-GR-01) AGROLAB Laboratory and Consultancy Services, Sindos, Thessaloniki, Greece Rep. Nr. PP309-00002-EFF-SB-GR-01 (334-50001) Published: No GEP/GLP: Yes	N	Y		Suntto n GmbH	no