European Commission

Combined Draft (Renewal) Assessment Report prepared according to Regulation (EC) N° 1107/2009
and
Proposal for Harmonised Classification and Labelling (CLH Report) according to Regulation (EC) N° 1272/2008

GIBBERELLINS (GA4, GA7)

Volume 3 – B.2 (PPP) – Novagib

Rapporteur Member State : Slovenia
Co-Rapporteur Member State: Slovakia

Version History

When	What
2019/April	Initial DRAR including co-RMS suggestions

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Introduction

This document has been prepared to evaluate the European Gibberellin Task Force (Valent Biosciences Corporation (Sumitomo Chemical Agro Europe), Fine Agrochemicals Ltd, Globachem NV) application for EU renewal of the Annex I inclusion of active substance gibberellins (GA4, GA7). The document supplements and updates the corresponding Annex B section of the Draft Assessment Report produced during the first review of gibberellins (2005 - 2011).

In this report studies submitted for the first inclusion of gibberellin in Annex I to Directive 91/414/EEC and for the renewal of the approval of gibberellin have been evaluated.

The representative formulation "Novagib" contains 10 g/L pure gibberellin and is formulated as soluble concentrate (SC). The formulation is plant growth regulator used on apples and pears.

Previous EU assessment

The dossier to support the first inclusion of gibberellin in Annex I to Directive 91/414/EEC was submitted to Hungary as the Rapporteur Member State in June 2005. The Draft Assessment Report is dated August 2006. Final Addendum to Draft Assessment Report, containing all individually submitted addenda on gibberellins, was compiled by EFSA in October 2011.

Structure of this document

In each section of this document, the following headings (a)-b)) occur:

a) Previous evaluation (2005-2011)

Under this heading study reports submitted for the first inclusion of gibberellin in Annex I to Directive 91/414/EEC are summarised. These studies have been re-evaluated for the purpose of the renewal in the light of current scientific and technical knowledge. The endpoints from the studies were also re-assessed and if considered relevant, re-calculated. However, full details from each study have not been repeated in this DRAR - therefore this DRAR is not a "stand-alone document" and for full reference sometimes the reader needs to consult the DAR (2005-2011).

b) Evaluation of additional data for the purpose of renewal of Annex I inclusion

Under this heading studies submitted prior to Annex I inclusion, but no evaluation of such material was presented in the form of Addenda to the DAR and studies that were submitted to support the application for renewal of Annex I inclusion are evaluated, i.e. new studies.

B.2. PHYSICAL AND CHEMICAL PROPERTIES OF THE PLANT PROTECTION PRODUCT NOVAGIB

Test or Study & Data point	Guideline and method	Test material purity and specification	Used methods / Results	Comments (Acceptable / Non acceptable)	GLP	Reference
B.2.1. APPEARANCE						
Physical state and colour **B.2.1/01**	Visual Assessment / organoleptic	Novagib (10 g L^{-1}) Lot no. 104/1	Clear, colourless viscous liquid at 25 °C with an odour similar to "heavy" alcohol.	Acceptable	Y	Comb 1997
	In-house	Novagib (10 g L^{-1}) Lot no. 1401437008	Clear, colourless, odourless liquid.	Acceptable	Y	Knowles 2010
	In-house	Novagib (10 g L^{-1}) Lot no. 1401437008	Clear, colourless liquid with no signs of separated material. Almost odourless.	Acceptable	Y	Kelly 2012
B.2.2. EXPLOSIVE AND OXIDIZING PROPERTIES						
Explosive properties **B.2.2/01**	EEC A. 14, Koene steel tube test, BAM Fall hammer test	Novagib (10 g L^{-1}) Lot no. 104/1	Not explosive	Acceptable	Y	Comb 1997
Oxidizing properties **B.2.2/02**	EEC A.21	Novagib (11 g L^{-1})	Neither the active ingredient nor the impurities contain a group that indicates the potential presence of oxidizing properties. presence of oxidizing properties. Not oxidising	Theoretical assessment Acceptable	Y	Mak 2004
B.2.3. FLAMMABILITY AND AUTO-FLAMMABILITY						
	EEC A.15	Novagib (10 g L^{-1})	Auto-ignition temperature: ≥400 °C at atmospheric pressure.	Acceptable	Y	Comb 1997

Test or Study & Data point	Guideline and method	Test material purity and specification	Used methods / Results	Comments (Acceptable / Non acceptable)	GLP	Reference
Flash point of the liquids formulations **B.2.3/01**		Lot no. 104/1				
	EEC A.9, closed cup	Novagib (10 g L^{-1}) Lot no. 104/1	Flash point: 86 °C at standard atmospheric pressure. The preparation should not be classified as a flammable liquid under EU CLP regulation.	Acceptable	Y	Comb 1997
Flammability of solid formulations **B.2.3/02**	-	-	Not applicable to a liquid.	-	-	-
Self-heating of formulation **B.2.3/03**	-	-	Gibberellins are a naturally occurring plant hormones that features no chemically unstable functional groups that could lead to an exothermic reaction with oxygen in the air. No other co-formulants are associated with the property of self-heating. Consequently it can be concluded that this mixture should not be classified as self-heating under Regulation (EC) No 1272/2008.	Acceptable explanation	-	-
B.2.4. ACIDITY/ALKALINITY AND PH VALUE						
pH of the neat aqueous formulation **B.2.4/01**	-	-	Please see below	-	-	-
pH of a 1 % dilution of the solid or non aqueous formulation **B.2.4/02**	CIPAC MT 75.2	Novagib (10 g L^{-1}) Lot no. 104/1	pH (1% w/v solution): 4.11 at 25 ± 1 °C	Acceptable	Y	Comb 1997
Acidity / Alkalinity **B.2.4/03**	In-house CIPAC MT 191	Novagib (10 g L^{-1}) Lot no. 1401437008	**Measurement** / **Pre storage** / **Post storage**: pH (neat) 4.26 / 4.25; pH (1% solution) 4.02 / 4.03; Acidity 0.134% m/m / 0.137% m/m. Measured before and after storage for two weeks at 54 °C in commercial packaging (1L PE/PA bottles).	Acceptable	Y	Knowles 2010

<table>
<tr><th>Test or Study & Data point</th><th>Guideline and method</th><th>Test material purity and specification</th><th>Used methods / Results</th><th>Comments (Acceptable / Non acceptable)</th><th>GLP</th><th>Reference</th></tr>
<tr><td></td><td>CIPAC MT 75.3
CIPAC MT 191</td><td>Novagib (10 g L^{-1})
Lot no. 1401437008</td><td><table><tr><th>Measurement</th><th>Pre storage</th><th>Post storage</th></tr><tr><td>pH (neat)</td><td>4.26</td><td>4.06</td></tr><tr><td>pH (1% solution)</td><td>4.02</td><td>3.95</td></tr><tr><td>Acidity</td><td>0.134% m/m</td><td>0.150% m/m</td></tr></table>Measured before and after storage for two years at ambient temperature in commercial packaging (1L PE/PA bottles).</td><td>Acceptable</td><td>Y</td><td>Kelly 2012</td></tr>
<tr><td colspan="7">B.2.5. VISCOSITY AND SURFACE TENSION</td></tr>
<tr><td>Viscosity of the liquid formulation
B.2.5/01</td><td>CIPAC MT 22.1</td><td>Novagib (10 g L^{-1})
Lot no. 104/1</td><td>Kinematic viscosity at 20 °C: 57.8 mm^2 s^{-1}</td><td>Acceptable</td><td>Y</td><td>Comb 1997</td></tr>
<tr><td></td><td>CIPAC MT 192 (OECD 114)</td><td>Novagib (10 g L^{-1})
Lot no. 102144K1701</td><td>Dynamic viscosity at 40 °C: 21 mPa s (10s^{-1} and 100s^{-1})
Kinematic viscosity at 40 °C: 20.3 mm^2 s^{-1}</td><td>Acceptable</td><td>Y</td><td>Clapperton 2017</td></tr>
<tr><td>Surface tension of the formulation
B.2.5/02</td><td>EEC A.5</td><td>Novagib (10 g L^{-1})
Lot no. 104/1</td><td>Aqueous surface tension at 0.25% v/v (maximum recommended usage concentration): 71.5 mN/m at 20 °C
Aqueous surface tension at 0.002% v/v (minimum recommended usage concentration): 71.5 mN/m at 20 °C
The preparation is not surface active.</td><td>Acceptable</td><td>Y</td><td>Comb 1997</td></tr>
<tr><td colspan="7">B.2.6. RELATIVE DENSITY AND BULK DENSITY</td></tr>
<tr><td>Relative density of the liquid formulation
B.2.6/01</td><td>OECD 109, EEC A.3</td><td>Novagib (10 g L^{-1})
Lot no. 104/1</td><td>Relative density (D_4^{20}): 1.04</td><td>Acceptable</td><td>Y</td><td>Comb 1997</td></tr>
<tr><td></td><td>OECD 109, EEC A.3</td><td>Novagib (10 g L^{-1})
Lot no. 102144K1701</td><td>Relative density (D_4^{20}): 1.032</td><td>Acceptable</td><td>Y</td><td>Clapperton 2017</td></tr>
</table>

<table>
<tr><th>Test or Study & Data point</th><th>Guideline and method</th><th>Test material purity and specification</th><th>Used methods / Results</th><th>Comments (Acceptable / Non acceptable)</th><th>GLP</th><th>Reference</th></tr>
<tr><td>Bulk density (pour and tap) of powder or granules
B.2.6/02</td><td>-</td><td>-</td><td>Not applicable to liquid preparations</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="7">B.2.7. STORAGE STABILITY AND SHELF-LIFE: EFFECTS OF TEMPERATURE ON TECHNICAL CHARACTERISTICS OF THE PLANT PROTECTION PRODUCT</td></tr>
<tr><td>Stability after accelerated storage (54°C during 14 days, 8 weeks at 40°C, 12 weeks at 35°C or 18 weeks at 30°C)
B.2.7/01</td><td>In-house
CIPAC MT 191
CIPAC MT 141
CIPAC MT 47.2
M564 method for determination of G4 and G7</td><td>Novagib (10 g L^{-1})
Lot no. 1401437008</td><td>The following properties were determined before and after storage for two weeks at 54 °C in commercial packaging (1L PE/PA bottles): active substance content, test item and packaging appearance, colour, odour, weight change, pH, acidity, dilution and persistent foaming.
<table>
<tr><th>Measurement</th><th>Pre storage</th><th>Post storage</th></tr>
<tr><td>GA4 content (% w/w)</td><td>0.948</td><td>0.939
(-1.0% from T0)</td></tr>
<tr><td>GA7 content (% w/w)</td><td>0.0272</td><td>0.0258
(-5.1% from T0)</td></tr>
<tr><td>GA7 + GA4 content
(% w/w)</td><td>0.975</td><td>0.965
(-1.0% from T0)</td></tr>
<tr><td>Packaging stability</td><td>No signs of degradation, deformation or leaking</td><td>No change</td></tr>
<tr><td>Weight change</td><td>-</td><td>-0.01%</td></tr>
</table>
There was no significant changes in active substance contents or physical properties following storage - please see the respective physical chemical endpoints for other results before and after storage.</td><td>Acceptable

Method M564 for determination of GA4/7 was validated and is presented in Vol.3, B5 for PPP.</td><td>Y</td><td>Knowles 2010</td></tr>
<tr><td>Effect of low temperature on</td><td>-</td><td>-</td><td>-</td><td>No data presented</td><td>-</td><td>-</td></tr>
</table>

<table>
<tr><th>Test or Study & Data point</th><th>Guideline and method</th><th>Test material purity and specification</th><th>Used methods / Results</th><th>Comments (Acceptable / Non acceptable)</th><th>GLP</th><th>Reference</th></tr>
<tr><td>stability of liquid formulation
B.2.7/02</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Shelf life following storage at ambient temperature
B.2.7/03</td><td>In-house
CIPAC MT 75.3
CIPAC MT 191
CIPAC MT 41
CIPAC MT 47.2
M564 method for determination of G4 and G7</td><td>Novagib (10 g L^{-1})
Lot no. 1401437008</td><td>The following properties were determined before and after storage for two years at ambient temperature in commercial packaging (1L PE/PA bottles): active substance content, test item and packaging appearance, colour, odour, weight change, pH, acidity, dilution and persistent foaming.
<table>
<tr><th>Measurement</th><th>Pre storage</th><th>Post storage</th></tr>
<tr><td>GA4/7 content (% w/w)</td><td>0.975</td><td>0.950 (-2.56% from T0)</td></tr>
<tr><td>Packaging stability</td><td>No damage. No sign of degradation, deformation or leakage</td><td>No change</td></tr>
<tr><td>Weight change</td><td>-</td><td>+0.03%</td></tr>
</table>
There were no significant changes in active substance content or physical properties following storage - please see the respective physical chemical endpoints for other results before and after storage.</td><td>Acceptable

Method M564 for determination of GA4/7 was validated and is presented in Vol.3, B5 for PPP.</td><td>Y</td><td>Kelly 2012</td></tr>
<tr><td colspan="7">B.2.8. TECHNICAL CHARACTERISTICS OF THE PLANT PROTECTION PRODUCT</td></tr>
<tr><td colspan="7">B.2.8.1. Wettability</td></tr>
<tr><td>Wettability of solid formulation
B.2.8.1/01</td><td>-</td><td>-</td><td>Not applicable to this product type (SC)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="7">B.2.8.2. Persistence foaming</td></tr>
<tr><td>Persistence of foaming of the</td><td>CIPAC MT 47.2</td><td>Novagib (10 g L^{-1})</td><td>Prior to storage no foam was observed one minute following perturbation.</td><td>Acceptable</td><td>Y</td><td>Knowles 2010</td></tr>
</table>

Test or Study & Data point	Guideline and method	Test material purity and specification	Used methods / Results	Comments (Acceptable / Non acceptable)	GLP	Reference
diluted formulation **B.2.8.2/01**		Lot no. 1401437008	Following storage at 54 °C for two weeks in commercial containers (1L PE/PA bottles), no foam was observed one minute following perturbation. Dilution rate - 0.6%			
	CIPAC MT 47.2	Novagib (10 g L^{-1}) Lot no. 1401437008	Prior to storage no foam was observed one minute following perturbation. Following storage at ambient temperature for two weeks in commercial containers (1L PE/PA bottles), no foam was observed one minute following perturbation. Dilution rate - 0.6% in CIPAC water D	Acceptable	Y	Kelly 2012
	CIPAC MT 47.1	Novagib (10 g L^{-1}) Lot no. 104/1	No foam produced one minute following perturbation Dilution rate - 0.25% v/v in CIPAC water D	Acceptable	Y	Comb 1997
B.2.8.3. Suspensibility						
Suspensibility of water dispersible formulation **B.2.8.3/01**	-	-	Not applicable to this product type (SC)	-	-	-
Spontaneity of dispersion of water dispersible formulation **B.2.8.3/02**	-	-	Not applicable to this product type (SC)	-	-	-
Dispersion stability of SE, OD or EG formulation **B.2.8.3/03**	-	-	Not applicable to this product type (SC)	-	-	-
B.2.8.4. Degree of dissolution and dilution stability						
Degree of dissolution of water soluble formulation **B.2.8.4/01**	-	-	Not applicable to this product type (SC)	-	-	-

Test or Study & Data point	Guideline and method	Test material purity and specification	Used methods / Results	Comments (Acceptable / Non acceptable)	GLP	Reference
Dilution stability of water soluble formulation **B.2.8.4/02**	CIPAC MT 41	Novagib (10 g L^{-1}) Lot no. 1401437008	Dilution stability: Prior to storage diluted preparation was clear with no separated material. No change following accelerated storage.	Acceptable	Y	Knowles 2010
	CIPAC MT 41	Novagib (10 g L^{-1}) Lot no. 1401437008	Dilution stability: Prior to storage no separated material was observed in diluted preparation. No sedimentation or separated material was observed and solution appeared uniform following ambient storage. Dilution rate - 0.5% v/v in CIPAC water D	Acceptable	Y	Kelly 2012
	CIPAC 41	Novagib (10 g L^{-1}) Lot no. 104/1	Dilution stability: clear and colourless with no precipitate or solid material following dilution and storage 18 hours at 20 °C. Dilution rate - 0.5% v/v in CIPAC water D	Acceptable	Y	Comb 1997
B.2.8.5. Particle size distribution, dust content, attrition and mechanical stability						
B.2.8.5.1. Particle size distribution						
Wet sieve test of water dispersible formulation **B.2.8.5.1/01**	-	-	Degree of dissolution: Not applicable to this product type (SC)	-	-	-
Size distribution of particles of powder or suspension concentrate formulation **B.2.8.5.1/02**	-	-	Degree of dissolution: Not applicable to this product type (SC)	-	-	-
Nominal size range of granule **B.2.8.5.1/03**	-	-	Degree of dissolution: Not applicable to this product type (SC)	-	-	-
B.2.8.5.2. Dust content						
Dust content of granular formulation **B.2.8.5.2/01**	-	-	Degree of dissolution: Not applicable to this product type (SC)	-	-	-

Test or Study & Data point	Guideline and method	Test material purity and specification	Used methods / Results	Comments (Acceptable / Non acceptable)	GLP	Reference
B.2.8.5.3. Attrition						
Attrition characteristics of granules and tablets **B.2.8.5.3/01**	-	-	Degree of dissolution: Not applicable to this product type (SC)	-	-	-
B.2.8.5.4. Hardness and integrity						
Hardness of tablets **B.2.8.5.4/01**	-	-	Degree of dissolution: Not applicable to this product type (SC)	-	-	-
Integrity of tablets **B.2.8.5.4/02**	-	-	Degree of dissolution: Not applicable to this product type (SC)	-	-	-
B.2.8.6. Emulsifiability, re-emulsifiability, emulsion stability						
Emulsifiability, emulsion stability and re-emulsifiability of formulation **B.2.8.6/01**	-	-	Degree of dissolution: Not applicable to this product type (SC)	-	-	-
B.2.8.7. Flowability, pourability and dustability						
Flowability of granular formulation **B.2.8.7/01**	-	-	Degree of dissolution: Not applicable to this product type (SC)	-	-	-
Pourability of suspensions **B.2.8.7/02**	-	-	Degree of dissolution: Not applicable to this product type (SC)	-	-	-
Dustability of dustable powders after accelerated storage **B.2.8.7/03**	-	-	Degree of dissolution: Not applicable to this product type (SC)	-	-	-

Test or Study & Data point	Guideline and method	Test material purity and specification	Used methods / Results	Comments (Acceptable / Non acceptable)	GLP	Reference
B.2.9. PHYSICAL AND CHEMICAL COMPATIBILITY WITH OTHER PRODUCTS INCLUDING PLANT PROTECTION PRODUCTS WITH WHICH ITS USE IS TO BE AUTHORISED						
Physical and chemical compatibility of tank mixtures **B.2.9/01**	-	-	Not applicable as the product is not intended to be used in combination with other plant protection products.	-	-	-
B.2.10. ADHERENCE AND DISTRIBUTION TO SEEDS						
Distribution and adhesion to seeds **B.2.9.10/01**	-	-	Not relevant for this product	-	-	-
B.2.11. OTHER STUDIES						
-	-	-	Self-reacting: Gibberellins is a naturally occurring plant hormone that is not classified as explosive, oxidising or an organic peroxide under EU CLP. No chemical moieties associated with the property of self-heating are featured on gibberellins or on any other co-formulant. It can therefore be concluded that the product should not be classified under this EU CLP endpoint. Corrosive to metals: For a mixture to be classified under this CLP endpoint, it must corrode steel or aluminium at a rate of 6.5 mm per year or greater at 55 °C. A material would have to be significantly corrosive to corrode metal at this rate, which would not be expected to apply to this substance. This property is associated with substances or mixtures with a low melting point, extreme pHs and aqueous solutions, and chemical characteristics associated with this property include acidic or basic functional groups and halogens - there are none present on any co-formulant within this formulation. It can therefore be concluded that this product is not corrosive to metals.	-	-	-

B.2.12. REFERENCES RELIED ON

By Data point

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
KCP 2.1/ 01, KCP 2.2/ 01, KCP 2.3, KCP 2.4/ 01, KCP 2.5/01, KCP 2.6/ 01, KCP 2.8.2/ 03, KCP 2.8.4/ 03	Comb, A. L.	1997	$GA_{4/7}$ 10 g/l SC: Determination of the Physico-Chemical Properties Report No. 96/FNA049/1102 Huntingdon Life Sciences Ltd, Eye, Suffolk, England, IP23 7PX. GLP Unpublished	N	N	-	Fine Agrochemicals Ltd.	In RR: IIIA 2.2.1, IIIA 2.3.1, IIIA 2.3.3, IIIA 2.5.1, IIIA 2.5.3, IIIA 2.6.1 In DAR: B.2.2.1, B.2.2.2, B.2.2.3, B2.2.4, B.2.2.6, B.2.2.8, B.2.2.9, B.2.2.10, B.2.2.11, B.2.2.12, B.2.2.13, B.2.2.19, B.2.2.22
KCP 2.1/ 02, KCP 2.4/ 02, KCP 2.7/ 01, KCP 2.8.2/ 01, KCP 2.8.4/ 01	Knowles, R.J.	2010	Accelerated Storage Stability Study on Novagib Formulation Report No. J17999 G C Laboratories Ltd., Analytical Chemistry Centre, 6 Fen End, Astwick Road, Stotfold, Hitchin, SG5 4BA. GLP Unpublished	N	N	-	Fine Agrochemicals Ltd.	In RR: IIIA 2.1, IIIA 2.4.1, IIIA 2.4.2, IIIA 2.7.1, IIIA 2.8.2, IIIA 2.8.4

KCP 2.1/ 03, KCP 2.7/ 02, KCP 2.8.2/ 02, KCP 2.8.4/ 02	Kelly, K.	2012	2 Years at Ambient Storage Stability Study on Novagib Formulation Report No. J 18000 G C Laboratories Ltd., Analytical Chemistry Centre, 6 Fen End, Astwick Road, Stotfold, Hitchin, SG5 4BA. GLP Unpublished	N	N	-	Fine Agrochemicals Ltd.	In RR: IIIA 2.7.5
KCP 2.2/ 02	Mak, W.A.	2004	Oxidising Properties of Novagib Report No. PML 2004-C99 TNO Prins Maurits Laboratory, Lange Kleiweg 137, The Netherlands. GLP Unpublished	N	N	-	Fine Agrochemicals Ltd.	In RR: IIIA 2.2.2
KCP 2.5/ 02, 2.6/ 02	Clapperton, R.	2017	The Viscosity of Novagib 10g/L SC at 40 °C Report No. BH/18/003/1 Battelle UK Ltd, Hampshire, UK, PO9 1SA. GLP Unpublished	N	Y	New study for the purposes of renewal	Fine Agrochemicals Ltd.	-