EXTRAPOLATION TABLE for EFFECTIVENESS of INSECTICIDES: PESTS ON TREE NUTS

INTRODUCTION

The table provides detailed lists of acceptable extrapolations organized by crop groups, for regulatory authorities and applicants, in the context of the registration of plant protection products for minor uses. The table should be used in conjunction with the EPPO Standard PP1/257(1) - *Efficacy and crop safety extrapolations for minor uses*. It is important to ensure that expert judgment and regulatory experience are employed when using these tables. EPPO excludes liability as to the reliability of the information provided through these tables.

The scope for extrapolation may be extended as data and experience with a certain plant protection products increases. The applicant should always provide appropriate justification and information to support the proposed extrapolation. For example, comparability of target biology may be a relevant factor, either in extrapolating to other target species or for the same target onto another crop. For crops, factors such as comparable growth habit, structure etc. should be considered.

TABLE FORMAT

The main pest species for the crop group are listed in Column 1 (although this is not exhaustive), and the pest group to which they belong is specified in Column 2. Companies may choose if they wish to provide data only for individual named species, which would then appear individually listed on the label. But underlined species have been identified as key major targets and as such it is advisable to generate data on these. Furthermore, data on these species then allow a claim to be made for the whole pest group (as specified in Column 2), if required. If a claim for the whole pest group is required but there is no underlined species, then data must be generated on all listed species.

Column 3 indicates the key indicator crop(s) for the crop group. In some instances this may be only one specified crop. In other cases, when separated by an ‘or’, the company may choose from a range of alternatives within the group. Data generated on crops in Column 3 may be used to extrapolate to all crops listed in Column 4. However, it is preferable to have data on several of the crops within the crop group, but data on the indicator crop should be available.

Column 5 identifies whether data on other crops against the same target may help to reduce the amount of required data on the indicator crop. It may be possible for a direct extrapolation without the need for further data on the indicator crop (marked with an asterisk (*)). However, this is dependent on the extent of available data and similarity of crop/target biology. The company should provide an appropriate reasoned case when wanting to use supporting data from other crop groups.

Column 6 gives examples of acceptable extrapolations for a particular pest claim onto other minor use crops. This is not a comprehensive list. Whether extrapolation may be direct (no data, marked with an asterisk (*)), or require additional supporting data on the minor use crop, will again be dependent on the extent and relevance of the existing database and companies should provide an appropriate reasoned case. If the crop is considered to be a major crop in some countries then it may not be appropriate to include in this column, and further data would be required. Companies will need to justify the status of the major crop/minor use.

EXAMPLES OF HOW TO USE THIS TABLE:

Pest		**Crops: within the tree nuts**		**Crops: outside the tree nuts**	
1 **Pest species**	**2** **Pest group name**	**3** **Indicator crops**	**4** **Extrapolation to other crops**	**5** **Data from these crops can support the indicator crops (reduced data or no data *)**	**6** **Extrapolation to crops (reduced or no data*)**
Oberea linearis OBERLI	Longhorn beetle	common hazelnut CYLAV	common walnut IUGRE	Pome fruits	alder ALUSS, white beech CIPBE, willow SAXSS
Pseudaulacaspis pentagona PSEAPE, *Lepidosaphes ulmi* LEPSUL, *Epidiaspis leperii* EPIDBE, *Eulecanium corni* LECACO	*Scales*[a]	common walnut IUGRE	Tree nuts	Stone fruit*, pome fruit*, woody ornamentals, citrus 1CIDG	

E.g. 1: In the first row above, in order to support a claim for *Oberea linearis* on common wallnut, data can be generated on common hazelnut. The number of trials required on this crop can be reduced if there are existing relevant data for *Oberea linearis* on pome fruits. Data on *Oberea linearis* generated on tree nuts can also be used to support claims on minor use crops such as alder, white beech or willow, but further additional data may be required. The company may also need to consider and justify the minor use status of the specified crop.

E.g. 2: In the second row above, in order to support a claim for all the scales listed (i.e. *Pseudaulacaspis pentagona, Lepidosaphes ulmi, Epidiaspis leperii,* and *Eulecanium corni*), data should be generated for at least one of the species on the indicator crop in order to claim

effectiveness on the whole group. The number of trials required on this crop can be reduced if there are existing relevant data for relevant scale pests on tree nuts.

NB. - Stone fruit and pome fruit in column 5 are frequently asterisked in this table, indicating that these are as good indicators as the indicator crop within the pest group (column 3).
- Extrapolation to other crops within the crop group (column 4) are not always proposed due to lack of experience. However, there may be opportunity to extrapolate information between the pests (column 1) on the indicator crop and using the asterisked crops in column 5. For further information, see extrapolation tables for pome fruits and stone fruits at:
http://www.eppo.int/PPPRODUCTS/extrapolation/tables.htm

EXTRAPOLATION REGARDING PROTECTED/OUTDOOR SITUATIONS

Please note that where crops may be grown in both protected and field situations, and where significant differences are expected in pest relevance or crop agronomy between indoor and outdoor situations, it is important to generate a proportion of the data on crops grown in both situations to ensure the product has been tested under a suitable range of typical and challenging conditions.

EXTRAPOLATION TABLE for EFFECTIVENESS of INSECTICIDES
► PESTS ON TREE NUTS (sweet almond PRNDU, hazelnut CYLAV, walnut IUGRE, sweet chestnut CSNSA, pistachio PIAVE)

Pest		**Crops: within the tree nuts**		**Crops: outside the tree nuts**	
1 **Pest species**	**2** **Pest group name**	**3** **Indicator crops**	**4** **Extrapolation to other crops**	**5** **Data from these crops can support the indicator crops (reduced data or no data *)**	**6** **Extrapolation to crops (reduced or no data*)**
Myzocallis castanicola MYZCCS, *Lachnus roboris LACNRO*	Aphid[a]	sweet chestnut CSNSA	Tree nuts	Stone fruit*, pome fruit*	
Chromaphis juglandicola CHRAJU, *Callaphis juglandis* CLLAJU		common walnut IUGRE			
Hyalopterus pruni HYALPR, *Brachycaudus amydalinus = Anuraphis amygdalinus = Aphis amygdalinus* BRDSAM, *Brachycaudus persicae* ANURPN,		sweet almond PRNDU			
Myzocallis coryli MYZCCO, *Corylobium avellanae* CRLOAV		common hazelnut CYLAV			

Panonychus ulmi METTUL	Spider mites	sweet almond PRNDU, common walnut IUGRE		Pome fruits*, grape* VITSS, citrus 1CIDG	Cherry, fig FIUSS, raspberry RUBID, peach PRNPS, pear PYUSS, plum PRNDO, apricot PRNAR
Tetranychus urticae TETRUR		common walnut IUGRE		Pome fruits, grape VITSS, citrus* 1CIDG, stone fruit*	Cherry, fig FIUSS, raspberry RUBID, peach PRNPS, pear PYUSS, plum PRNDO, apricot PRNAR, ornamental trees and shrubs
Phytocoptella avellanae = Eriophyes avellanae = Phytoptus avellanae ERPHAV	Bud and Rust mites	common hazelnut CYLAV		Pome fruit*, stone fruit	
Eriophyes spp. 1ERPHG		common walnut IUGRE		Pome fruit, blackcurrant, grape* VITSS	
Phyllocoptes unguiculatus 1PHYCG		common walnut IUGRE		Pome fruit*	
Phyllocoptes graniti 1PHYCG		sweet almond PRNDU		Pome fruit*	
Dryocosmus kuriphilus DRYCKU, Cynipid of chestnut 1CYNIF	Gall wasps	sweet chestnut CSNSA			
Eurytoma amygdali EURTAM		sweet almond PRNDU		plum PRNDO	
Agonoscena pistaciae	Psyllidae	Pistachio PIAVE		pear	
Stictocephala bisonia STICBI	Cicadellidae	common walnut IUGRE		Pome fruit, grape VITSS, ornamentals	

Pseudaulacaspis pentagona PSEAPE, *Lepidosaphes ulmi* LEPSUL, *Epidiaspis leperii* EPIDBE, *Eulecanium corni* LECACO	*Scales*[a]	common walnut IUGRE	Tree nuts	Stone fruit*, pome fruit*, woody ornamentals, citrus 1CIDG	
Pseudaulacaspis pentagona PSEAPE, *Quadraspidiotus perniciosus* QUADPE		sweet almond PRNDU			Gooseberry RIBUC, ornamental trees and shrubs
Eulecanium spp. 1EULCG		common hazelnut CYLAV			
Pistaciaspis(=Lepidosaphes) pistaciae, Melanaspis inopinata MELAIN		Pistachio PIAVE			
Pistaciaspis pistaciaae, Melanaspis inopinata		Pistachio PIAVE			
Gonocerus acuteangulatus GONRAC	Coreid bugs	common hazelnut CYLAV		Pome fruits*	
Carpocoris sp. CARRSP, *Palomena prasina* PALOPR	Stink bugs Pentatomidae	common hazelnut CYLAV		Pome fruits*	
Acrosternum sp. 1ACSTG*, Apodiphus amygdale, Brachynema* sp. 1BRNMG*, Lygaeus pandurus* LYGACI		Pistachio PIAVE		Pome fruits*, grapes* VIVIN	
Lygaeus (=Spilostethus**)** *pandurus* LYGACI	Seed bugs	Pistachio PIAVE		Pome fruits*, grapes* VIVIN	
Oberea linearis OBERLI	Longhorn beetle	common hazelnut CYLAV	common walnut IUGRE	Pome fruits	alder ALUSS, white beech CIPBE, willow SAXSS

Scolytus rugulosus SCOLRU, *Anisandrus dispar = Xyleborus dispar* XYLBDI	Bark beetles	sweet chestnut CSNSA, sweet almond PRNDU, common walnut IUGRE	sweet chestnut CSNSA	Olive OLVSS, pome fruit, stone fruit, woody ornamentals, forestry	
Hylesinus vestitus		Pistachio PIAVE			
Capnodis tenebrionis CAPNTE	Root or wood feeding beetles	sweet almond PRNDU		stone fruit	
Gracillaria roscipennella = Caloptilia roscipennella GRACRO (mining)	Lepidoptera (leaf feeding)	common walnut IUGRE		Pome fruits*	
Croesus septentrionalis CROESE		common hazelnut CYLAV		Pome fruits*	Ornamental trees
Archips spp. ARCHSP		sweet almond PRNDU		Pome fruits*	Ornamental trees
Hyponomeuta spp.		sweet almond PRNDU		Pome fruits*, stone fruit*	Ornamental trees
Ocneria terebinthina		pistachio PIAVE		Pome fruits, tomato	
Pammene fasciana PAMMFA (*Ectomyelois ceratonie*)	Lepidoptera (fruit-boring)	sweet chestnut CSNSA		Pome fruits	beech FAUSS, quercus 1QUEG
Anarsia lineatella ANARLI		sweet almond PRNDU		peach PRNPS	heart cherry PRNAJ, plum PRNDO
Paramyelois ceratoniae 1PARMG (Ectomyelois)		sweet almond PRNDU or sweet chestnut CSNSA or common walnut IUGRE	Sweet chestnut CSNSA, pistachio PIAVE	Pome fruits*, stone fruit*, Citrus 1CIDG	Fig FIUSS
Cydia molesta LASPMO		sweet almond PRNDU		Pome fruits, stone fruits	

Cydia fagiglandana LASPGR, *Cydia splendana* LASPSL, *Pammene fasciana* PAMMFA		sweet chestnut CSNSA	Common hazelnut CYLAV	Pome fruits	Ornamental trees (beech, oak)
Cydia pomonella CARPPO		sweet almond PRNDU, common walnut IUGRE	common walnut IUGRE	Apricot PRNAR, pome fruits	Peach PRNPS, quince CYDOB
Recurvaria pistaciicola		Pistachio PIAVE		apple MABSS	
Operophtera brumata CHEIBR	Lepidoptera (leaf and fruit damaging)	sweet almond PRNDU		Pome fruits, stone fruits	apricot PRNAR, black currant RIBNI, heart cherry PRNAJ, plum PRNDO, red currant RIBRU, Ornamental trees
Palumbina guerinii		Pistachio PIAVE		Tomato LYPES	
Zeuzera pyrina ZEUZPY	Lepidoptera (wood and root borer)	common walnut IUGRE, sweet chestnut CSNSA, common hazelnut CYLAV		Pome fruits	Pear PYUSS, plum PRNDO, heart cherry PRNAJ, olive OLVSS, pomegranate PUNGR, black currant RIBNI, quince CYDOB, red currant RIBRU, citrus 1CIDG, grape VITSS, ornamentals, forstry
Kermania pistaciella		Pistachio PIAVE		Apple MABSS	
Rhynchites spp. RNCHSP	Weevils	common walnut IUGRE		apple MABSS	Stone fruit
Peritelus spp. PERESP		common walnut IUGRE, sweet chestnut CSNSA		apple MABSS	peach PRNPS, ornamental trees, forestry

Curculio nucum = Balaninus nucum CURCNU, *Curculio elephas = Balaninus elephas* CURCEL		common hazelnut CYLAV	Sweet chestnut CSNSA	pear PYUSS, stone fruit	Persimmon plum DOSKA, plum PRNDO, *Quercus* 1QUEG
Anthonomus amygdali ANTHAM		sweet almond PRNDU		apple MABSS	
Eurytoma plotnikovi EURTPL*, Megastigmus pistaciae* MEGSBA (*Hymenoptera: Chalcidoidea*)	Seed wasps	Pistachio PIAVE		apple MABSS (sawfly control)	
Neurotoma nemoralis NEURNE	Webspinning sawfly (wasp)	Sweet almond PRNDU		Stone fruits*, pome fruits*	peach PRNPS

[a] Data from at least one of the species on the indicator crop should be supplied in order to claim effectiveness on the whole pest group.