

2015 Global Minor Use Workshop Update

Daniel Kunkel

This material is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2015-34383-23710 with substantial cooperation and support from the State Agricultural Experiment Stations, USDA-ARS and USDA-FAS. In accordance with Federal Law and U.S. Department of Agriculture policy, this institution is prohibited from discriminating on the basis of race, color, national origin, sex, age or disability.



First Global Workshop

Chicago 2015

- Recommendation from GMUS 2
- Sought to Establish Research Priorities for Pilot Global Registration Projects
- Started with Surveys to populate a Global Database.
 - More than 2,750 entries...from 40 countries.
- Before the workshop requested Nominations of crop/pest priorities
- Prepared a Trend analysis/filters to identify project with highest interest
- Discussed priorities at workshop in Chicago and priorities in three areas – Temperate, Protected, and Tropical

The NEED FOR PEST CONTROL CONTINUES

Results of Global Workshop - 2015
Surveyed 40 countries, 2500 pest problems

Cropping System	Pest/Crop rank 1 - A (highest votes)	Pest/Crop rank 2 - B (votes)	Pest rank 3 – B (votes)
Protected (green house)	<u>Aphids /lettuce</u> Possible Solutions: Flonicamid, Pymetrozine, Cyantraniliprole, Sulfoxaflor, NA 11630	<u>Thrips /fruiting vegs.</u> Possible solutions: Cyantraniliprole, Novaluran, Cyclaniliprole	<u>Whiteflies/fruiting veg.</u> Possible solutions: Flupyradifurone, Cyantraniliprole, Novaluran, NA 11630
Temperate	<u>Downy mildew/leafy vegetables</u> Possible solutions: Ametoctradin + Dimethomorph, Acibenzolar, Zoxamide, Fluopicolide + Propamocarb Cyazofamid, Oxathiapiprolin Famoxadone + Cymoxanil	<u>Aphids/legumes crops</u> Possible solutions: Flonicamid, Pymetrozine Cyantraniliprole, Sulfoxaflor, Dinotefuran Spirotetramat Flupyradifurone, NA 11630	<u>Weeds/leafy vegetables</u> Possible solutions: s-metolachlor
Tropical Fruit	<u>Fruit flies</u> Possible solutions: Spinosad, Cyantraniliprole Kaolin, NA 11630	<u>Anthracnose</u> Possible solutions: Trifloxystrobin + Fluopyram Pyraclostrobin + Metiram Mandistrobin, Isofenamid Azoxystrobin + Difenconazole Cyprodinil + Fludioxonil Penthiopyrad	<u>Psyllids on Citrus crops</u> Possible solutions: Diflubenzuron, Flonicamid Sulfoxaflor, Buprofezin, NA 11630

Follow-up

- Quarterly teleconferences
- Sharing research activities
- Annual report
- Some joint research, mostly regional
- Potential project with a new active ingredient.
- Large body to coordinate, lots of moving parts.
- Requires commitment from MFG – also a lot of coordination for a Global project, esp in working with public entities.
- Progress is being made.

Results of Global Workshop – 2015
Surveyed 40 countries, 2500 pest problems

Projects moving forward

Protected (greenhouse) Priorities

Priority	Pest/Crop rank 1 - A (highest votes)
A	<u>Aphids /lettuce</u> Possible Solutions: Sulfoxaflor – EU studies in 2016 Acetamiprid and Pyriproxyfen (Possible project in AU, reg in US). NA 11630 – Possible 2017/2018 project
B	<u>Thrips /fruiting vegs.</u> Possible solutions: Spinetoram + Sulfoxaflor (2017 NA Project) NA 11630 – Possible 2017/2018 project – NA and EU
B	<u>Whiteflies/fruiting veg.</u> Possible solutions: Flupyradifurone (2012 NA Project) Afidopyropen (2016 NA project) Spinetoram + Sulfoxaflor (2017 NA Project) NA 11630 – Possible 2017/2018 project – NA and EU

NA= North America

Results of Global Workshop – 2015
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Projects moving forward

Temperate Crop Priorities

Priority	Pest/Crop rank 1 - A (highest votes)
A	<u>Downy mildew/leafy vegetables</u> Possible solutions: Ametoctradin + Dimethomorph (registered AU) Oxathiapiprolin (Registered in NA and AU) Mandipropamid (Registered in NA) Mefenoxam + Acibenzolar-S-methyl (EU priority) Ethaboxam (2017 NA Brassica study)
B	<u>Aphids/legumes crops</u> Possible solutions: Flonicamid (Registered in NA, EU exploring) Acetamiprid + pyriproxyfen (possible AU project) NA 11630 – Possible 2017/2018 project
B	<u>Weeds/leafy vegetables</u> Possible solutions: None.

Results of Global Workshop – 2015
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Projects moving forward

Tropical Fruit Priorities

Priority	Pest/Crop rank 1 - A (highest votes)
A	<p><u>Fruit flies</u> Possible solutions: Spinetoram: LA studies being organized; banana, papaya, pineapple NA 11630: Possible 2017/2018 project; Global project pending on; Mango, Pineapple and dragon fruit and maybe others...</p>
B	<p><u>Anthraxnose</u> Possible solutions: Azoxystrobin + Difenconazole (global project on dragon fruit) Fluopyram + Tebuconazole (US 2016 pomegranate and Guava) Trifloxystrobin + Fluopyram (2017 Papaya, US and Costa Rica) Fluopyram (2017 AU passion fruit, custard apples (cherimoya/sweet sop/sugar apple), olives and persimmons) Fluxopyroxad (AU mango for powdery mildew) Fluxopyroxad + Pyraclostrobin (pomegranate 2016 US project)</p>
B	<p><u>Psyllids on Citrus crops</u> Possible solutions: Too large of crop....</p> <p>LA=Latin America</p>

The Global Minor Use *Fund*

- ❖ USDA- FAS has contributed towards a launch to the GMUF
 - Three Years >>> Five years
 - Secure other funding sources – **Yes about \$80,000**
 - Establish infrastructure – **needed: Board of Advisors, then quarterly calls**
 - Support Global Prioritization Process - **Yes**
 - Support some capacity building – **Yes via new projects**
 - Support start up of some joint projects – **Yes**
 - **Research funds allocated : \$200,000**
 - There have been donors...need more....
 - Better to have secured funds when making priorities.

Questions/Comments

THANK YOU FOR YOUR KIND ATTENTION
Questions/Comments?

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Global Minor Use Priority Setting Meeting II



Wednesday, Oct. 4, 2017
Montreal, Canada





Guidelines and Process

- How was the current database populated?
- How does the scoring system help us prioritize our greatest needs?
- Explanation of the scoring system
- Steps in today's process
- What is your role?
- Summary and wrap up
- Questions and discussion
- Next steps



Populating the database 2017

Crop	Target Group	Target, Scientific	Climate Zone	Field, Greenhouse	AR	AT	AU	BE	CA	CR	CY	DE	EE	FI	FR	GB	HU	KE	LT	MX	NL	NO	NZ	PT	SE	SK	US
Cherries	Fruit flies	Drosophila suzukii	temperate	field		1		1	2			1	x		1	1				1			1				1
Raspberry	Fruit flies	Drosophila suzukii	temperate	field		1		1	2			1	x		1	1	1			x			1		2	2	
Carrot	Flies	Psila rosae	temperate	field				1	1			1	x		1							1		1	2	x	
Strawberry	Fruit flies	Drosophila suzukii	temperate	field				1	x			1	x		1	1	x						1		2	2	
Blueberry	Fruit flies	Drosophila suzukii	temperate	field				1	2			1	x			1				x	1			2			1
Ornamentals	Thrips	Frankliniella occidentalis	temperate	field				1	1	x			x		1						1	x			1		
Cabbage	Flies	Delia radicum	temperate	field				1	4			1	3			2	x		2			1		1		x	x
Carrot	Pythium	Pythium sp.	temperate	field	2				x				x		1	1					1	1		x			x
Strawberry	Botrytis	Botrytis cinerea	temperate	field			x	2	x	x			1						2						1	1	x
Onion, dry bulb	Weeds	Dicotyledonous plants	temperate	field								x	x			2						2		1		1	3
Currants	Mites	Cecidophyopsis ribis	temperate	field				4				1	1	1								x			4	x	
Lettuce	Weeds	Dicotyledonous plants	temperate	field				4	x			1	x			1	x					5		2			



- 23 countries participated
- 2015 priorities + new 2017 priorities = 3,852 priorities globally
- “x” indicated the minor use priority and additional rankings of “1, 2, 3, 4, 5” were indicated for the top 35 priorities



Frequency of priorities reported



Crop	Target, Scientific	number needs reported (x, 1...5)	AR	AT	AU	BE	CA	CR	DE	EE	FI	FR	GB	HU	LT	MX	NL	NO	PT	SE	SK	US
Cherries	<i>Drosophila suzukii</i>	10		1		1	2		1	x		1	1				1		1			1
Raspberry	<i>Drosophila suzukii</i>	12		1		1	2		1	x		1	1	1		x			1		2	2
Carrot	<i>Psila rosae</i>	9				1	1		1	x		1						1	1	2	x	
Strawberry	<i>Drosophila suzukii</i>	10				1	x		1	x		1	1	x					1		2	2
Blueberry	<i>Drosophila suzukii</i>	9				1	2		1	x			1			x	1		2			1
Ornamentals	<i>Frankliniella occidentalis</i>	8				1	1	x		x		1					1	x		1		
Cabbage	<i>Delia radicum</i>	11				1	4		1	3			2	x	2			1	1		x	x
Carrot	<i>Pythium sp.</i>	9	2				x			x		1	1				1	1	x			x
Strawberry	<i>Botrytis cinerea</i>	9			x	2	x	x		1					2					1	1	x
Onion, dry bulb	Dicotyledonous plants	7							x	x			2					2	1		1	3
Currants	<i>Cecidophyopsis ribis</i>	7				4			1	1	1							x		4	x	
Lettuce	Dicotyledonous plants	8				4	x		1	x			1	x				5	2			

- Column 3 = how many countries identified the priority
- *Drosophila* on raspberry most often reported (12 countries)
- *Delia* on cabbage and *Drosophila* on strawberry and cherries rank 2 and 3



Preparing the database for a scoring system

Crop	Target, Scientific	sum values priority needs (1...5)	number priority needs reported (1...5)	AR	AT	AU	BE	CA	CR	DE	EE	FI	FR	GB	HU	LT	MX	NL	NO	PT	SE	SK	US
Cherries	<i>Drosophila suzukii</i>	10	9		1		1	2		1	x		1	1				1		1			1
Raspberry	<i>Drosophila suzukii</i>	13	10		1		1	2		1	x		1	1	1		x			1		2	2
Carrot	<i>Psila rosae</i>	8	7				1	1		1	x		1						1	1	2	x	
Strawberry	<i>Drosophila suzukii</i>	9	7				1	x		1	x		1	1	x					1		2	2
Blueberry	<i>Drosophila suzukii</i>	9	7				1	2		1	x			1			x	1		2			1
Ornamentals	<i>Frankliniella occidentalis</i>	5	5				1	1	x		x		1					1	x		1		
Cabbage	<i>Delia radicum</i>	15	8				1	4		1	3			2	x	2			1	1		x	x
Carrot	<i>Pythium sp.</i>	6	5	2				x			x		1	1				1	1	x			x
Strawberry	<i>Botrytis cinerea</i>	7	5			x	2	x	x		1					2					1	1	x
Onion, dry bulb	Dicotyledonous plants	9	5							x	x			2					2	1		1	3
Currants	<i>Cecidophyopsis ribis</i>	11	5				4			1	1	1							x		4	x	
Lettuce	Dicotyledonous plants	13	5				4	x		1	x			1	x				5	2			



- Counted the priorities given a ranking of 1, 2, 3, 4 or 5
- Column 3 = sum of the 1 – 5 rankings
- Column 4 = how many times a priority was given a 1 – 5 ranking



Values calculated so far to use in the scoring system



Crop	Target, Scientific	sum values priority needs (1...5)	number priority needs reported (1...5)	number needs reported (x, 1...5)
Cherries	<i>Drosophila suzukii</i>	10	9	10
Raspberry	<i>Drosophila suzukii</i>	13	10	12
Carrot	<i>Psila rosae</i>	8	7	9
Strawberry	<i>Drosophila suzukii</i>	9	7	10
Blueberry	<i>Drosophila suzukii</i>	9	7	9
Ornamentals	<i>Frankliniella occidentalis</i>	5	5	8
Cabbage	<i>Delia radicum</i>	15	8	11
Carrot	<i>Pythium sp.</i>	6	5	9
Strawberry	<i>Botrytis cinerea</i>	7	5	9
Onion, dry bulb	Dicotyledonous plants	9	5	7
Currants	<i>Cecidophyopsis ribis</i>	11	5	7
Lettuce	Dicotyledonous plants	13	5	8

- Frequency need = repeat of column 3 slide 4
- Frequency priority = repeat of column 4 on slide 5
- These are now the values used to calculate **the 'score'**



The 'scoring' system explained

A	C	F	G	H	I	J	K	L
Crop	Target, Scientific	= H * K = Score 1 priority needs (1...5)	= H * L = Score 2 all needs (x, 1...5)	= 1 / I reciprocal (1...5)	= J / K mean value priority needs (1...5)	sum values priority needs (1...5)	number priority needs reported (1...5)	number needs reported (x, 1...5)
Cherries	<i>Drosophila suzukii</i>	8.1	9.0	0.9	1.1	10	9	10
Raspberry	<i>Drosophila suzukii</i>	7.7	9.6	0.8	1.3	13	10	12
Carrot	<i>Psila rosae</i>	6.1	8.1	0.9	1.1	8	7	9
Strawberry	<i>Drosophila suzukii</i>	5.4	8.0	0.8	1.3	9	7	10
Blueberry	<i>Drosophila suzukii</i>	5.4	7.2	0.8	1.3	9	7	9
Ornamentals	<i>Frankliniella occidentalis</i>	5.0	8.0	1.0	1.0	5	5	8
Cabbage	<i>Delia radicum</i>	4.3	5.5	0.5	1.9	15	8	11
Carrot	<i>Pythium sp.</i>	4.2	7.2	0.8	1.2	6	5	9
Strawberry	<i>Botrytis cinerea</i>	3.6	6.3	0.7	1.4	7	5	9
Onion, dry bulb	Dicotyledonous plants	2.8	4.2	0.6	1.8	9	5	7
Currants	<i>Cecidophyopsis ribis</i>	2.3	2.8	0.4	2.2	11	5	7
Lettuce	Dicotyledonous plants	1.9	3.2	0.4	1.6	13	5	8



- Highest priorities were # 1's – these are converted to the highest rank
- Column F = score based on 1 – 5 rankings only
- Column G = score based on all rankings, x's and 1 – 5
- Column H = assigning value to the # 1's provided
- Column I = average vote



Switch now to the main GMUP database Excel table



NAFTA Crop group															
NAFTA Crop group	NAFTA Crop group name	Codex Crop group	Codex Crop code	Crop EN common name	Crop EPPO code	Target EN common name	Target scientific name	Target EPPO code	Field, Greenhouse	Climate zone	Score 1 needs with Priority	Score 2 needs report	average value	sum values	n needs with priority
1	Root & Tuber Veg	16	DC 0604	Ginseng	PNXGI	May beetles	Phyllophaga sp.	3GINC	field	temperate				0	0
3	Root & Tuber Veg	16	VR 0075	Dasheen	CXSES	Aphids	Aphis gossypii	APHIGO	field	tropical					
4	Root & Tuber Veg	16	VR 0075	Dasheen	CXSES	Beetles	Papuana sp.	PAPUSP	field	tropical					
5	Root & Tuber Veg	16	VR 0075	Dasheen	CXSES	Caterpillars	Hippotion celerio	HIPTCE	field	tropical					
6	Root & Tuber Veg	16	VR 0075	Dasheen	CXSES	Caterpillars	Spodoptera litura	PRODLI	field	tropical					
7	Root & Tuber Veg	16	VR 0075	Dasheen	CXSES	Leafhoppers	Tarophagus proserpina	n/a	field	tropical					
8	Root & Tuber Veg	16	VR 0075	Dasheen	CXSES	Phytophthora	Phytophthora colocasiae	PHYTOO	field	tropical					
9	Root & Tuber Veg	16	VR 0075	Dasheen	CXSES	Pythium	Pythium sp.	PYTHSP	field	tropical					
10	Root & Tuber Veg	16	VR 0075	Dasheen	CXSES	Whiteflies	Aleurodicus dispersus	ALEDDI	field	tropical					
11	Root & Tuber Veg	16	VR 0075	Dasheen	CXSES	Whiteflies	Bemisia argentifolii	BEMIAR	field	tropical					
12	Root & Tuber Veg	16	VR 0075	Dasheen	CXSES	Whiteflies	Bemisia tabaci	BEMITA	field	tropical					
13	Root & Tuber Veg	16	VR 0075	Potato	SOLTU	Phytophthora	Phytophthora sp.	PHYTSP	field	temperate	1.0	2.5	2.0	4	2
14	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Alternaria	Alternaria solani	ALTESO	field	tropical	0.3	0.3	3.0	3	1
15	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Anthraxnose	Glomerella cingulata	GLOMCI	field	tropical	1.0	1.0	2.0	4	2
16	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Anthraxnose	Phyllosticta sp.	PHYSSP	field	tropical	0.3	0.3	3.0	3	1
17	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Ants	Acromyrmex octospinosus	ACRXOC	field	tropical	0.3	0.7	3.0	3	1
18	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Caterpillars	Erinnyis alope	ERINAL	field	tropical	0.8	0.8	2.5	5	2
19	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Caterpillars	Erinnyis ello	ERINEL	field	tropical	0.3	0.3	3.0	3	1
20	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Curvularia	Cochliobolus lunatus	COCHLU	field	tropical	0.3	0.3	3.0	3	1
21	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Fusarium	Fusarium oxysporum	FUSAOX	field	tropical	0.3	0.3	3.0	3	1
22	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Mealybugs	Planococcus citri	PSECCI	field	tropical	0.3	0.3	3.0	3	1
23	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Mealybugs	Phenacoccus gossypii	PHENGO	field	tropical	0.3	0.3	3.0	3	1
24	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Mildew	Fungi	1FUNGK	field	tropical	1.0	1.0	2.0	4	2
25	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Nematodes	Meloidogyne sp.	MELGSP	field	tropical	0.3	0.3	3.0	3	1
26	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Nematodes	Pratylenchus coffeae	PRATCO	field	tropical	0.3	0.3	3.0	3	1
27	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Nematodes	Scutellonema bradys	SCUNBR	field	tropical	0.3	0.3	3.0	3	1
28	Root & Tuber Veg	16	VR 0463	Cassava	MANES	Rhizoctonia	Rhizoctonia sp.	RHIZSP	field	tropical	0.3	0.7	3.0	3	1

GMUPL 2017

example rank calculation

ranks greenhouse

ranks temperate

ranks tropical

freq. pest group greenhouse

...

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GMUS Main Priority-Setting Table

- 1st tab – total database with scoring system presented
- 2nd tab - Sample scoring calculation from temperate field crops
- 3rd tab – current scores for greenhouse priorities
- 4th tab – current scores for temperate priorities
- 5th tab – current scores for tropical priorities
- 6th – 11th tabs - ancillary information derived from the priority-setting process



Steps in today's process

- Summarize key results and scores of database priority-setting exercise in temperate crops, tropical crops and protected crops
- Review and identify other critical crop-pest priorities
- Rank the top priorities in each of greenhouse, temperate and tropical
- Choose a number one in each of greenhouse, temperate and tropical (the 'A' priority)
- Identify 2nd and 3rd priorities in each (the 'B' priorities)



Your role as participants

- Don't be shy
- Help to identify the most common critical needs shared across countries
- Consider ranking based upon lack of available pest control products, new invasive pest, resistance issues, trade issues
- Choose a number one in each of temperate, tropical and protected crops (the 'A' priority)
- Identify 2nd and 3rd priorities in each of temperate, tropical and protected crops (the 'B' priorities)



Questions and Discussion

Review the outcome of
today's process



Next Steps



- Summarize and distribute the outcome of today's proceedings
- Identify potential solutions for all of the top crop-pest priorities chosen
- Contact registrants
- Work towards a joint study plan
- Communicate progress



Gracias

Merci

Thank you

Obrigado

Danke

ありがとうございました

Grazie

Dank je

謝謝

Спасибо

धन्यवाद



Priority areas and update of Global Database

Jim Chaput, Mario Wick

Montreal, October 4th 2017

Global Minor Use Needs

minor use needs (x) and priority needs (1 ... 5) reported in 2017

Crop	Target Group	Target, Scientific	Climate Zone	Field, Greenhouse	AR	AT	AU	BE	CA	CR	CY	DE	EE	FI	FR	GB	HU	KE	LT	MX	NL	NO	NZ	PT	SE	SK	US
Cherries	Fruit flies	<i>Drosophila suzukii</i>	temperate	field		1		1	2			1	x		1	1					1			1			1
Raspberry	Fruit flies	<i>Drosophila suzukii</i>	temperate	field		1		1	2			1	x		1	1	1			x				1		2	2
Carrot	Flies	<i>Psila rosae</i>	temperate	field				1	1			1	x		1							1		1	2	x	
Strawberry	Fruit flies	<i>Drosophila suzukii</i>	temperate	field				1	x			1	x		1	1	x							1		2	2
Blueberry	Fruit flies	<i>Drosophila suzukii</i>	temperate	field				1	2			1	x			1				x	1			2			1
Ornamentals	Thrips	<i>Frankliniella occidentalis</i>	temperate	field				1	1	x			x		1						1	x			1		
Cabbage	Flies	<i>Delia radicum</i>	temperate	field				1	4			1	3			2	x		2			1		1		x	x
Carrot	Pythium	<i>Pythium</i> sp.	temperate	field	2				x				x		1	1					1	1		x			x
Strawberry	Botrytis	<i>Botrytis cinerea</i>	temperate	field			x	2	x	x			1						2						1	1	x
Onion, dry bulb	Weeds	Dicotyledonous plants	temperate	field								x	x			2						2		1		1	3
Currants	Mites	<i>Cecidophyopsis ribis</i>	temperate	field				4				1	1	1								x			4	x	
Lettuce	Weeds	Dicotyledonous plants	temperate	field				4	x			1	x			1	x					5		2			

Number of all needs reported (needs x and priority needs 1 ... 5)

Crop	Target, Scientific	number needs reported (x, 1...5)	AR	AT	AU	BE	CA	CR	DE	EE	FI	FR	GB	HU	LT	MX	NL	NO	PT	SE	SK	US
Cherries	Drosophila suzukii	10		1		1	2		1	x		1	1				1		1			1
Raspberry	Drosophila suzukii	12		1		1	2		1	x		1	1	1		x			1		2	2
Carrot	Psila rosae	9				1	1		1	x		1						1	1	2	x	
Strawberry	Drosophila suzukii	10				1	x		1	x		1	1	x					1		2	2
Blueberry	Drosophila suzukii	9				1	2		1	x			1			x	1		2			1
Ornamentals	Frankliniella occidentalis	8				1	1	x		x		1					1	x		1		
Cabbage	Delia radicum	11				1	4		1	3			2	x	2			1	1		x	x
Carrot	Pythium sp.	9	2				x			x		1	1				1	1	x			x
Strawberry	Botrytis cinerea	9			x	2	x	x		1					2					1	1	x
Onion, dry bulb	Dicotyledonous plants	7							x	x			2					2	1		1	3
Currants	Cecidophyopsis ribis	7				4			1	1	1							x		4	x	
Lettuce	Dicotyledonous plants	8				4	x		1	x			1	x				5	2			

Number of priority needs reported (only 1 ... 5)

Crop	Target, Scientific	sum values priority needs (1...5)	number priority needs reported (1...5)	AR	AT	AU	BE	CA	CR	DE	EE	FI	FR	GB	HU	LT	MX	NL	NO	PT	SE	SK	US
Cherries	Drosophila suzukii	10	9		1		1	2		1	x		1	1				1		1			1
Raspberry	Drosophila suzukii	13	10		1		1	2		1	x		1	1	1		x			1		2	2
Carrot	Psila rosae	8	7				1	1		1	x		1						1	1	2	x	
Strawberry	Drosophila suzukii	9	7				1	x		1	x		1	1	x					1		2	2
Blueberry	Drosophila suzukii	9	7				1	2		1	x			1			x	1		2			1
Ornamentals	Frankliniella occidentalis	5	5				1	1	x		x		1					1	x		1		
Cabbage	Delia radicum	15	8				1	4		1	3			2	x	2			1	1		x	x
Carrot	Pythium sp.	6	5	2				x			x		1	1				1	1	x			x
Strawberry	Botrytis cinerea	7	5			x	2	x	x		1					2					1	1	x
Onion, dry bulb	Dicotyledonous plants	9	5							x	x			2					2	1		1	3
Currants	Cecidophyopsis ribis	11	5				4			1	1	1							x		4	x	
Lettuce	Dicotyledonous plants	13	5				4	x		1	x			1	x				5	2			

Repeat of the values calculates so far

Crop	Target, Scientific	sum values priority needs (1...5)	number priority needs reported (1...5)	number needs reported (x, 1...5)
Cherries	Drosophila suzukii	10	9	10
Raspberry	Drosophila suzukii	13	10	12
Carrot	Psila rosae	8	7	9
Strawberry	Drosophila suzukii	9	7	10
Blueberry	Drosophila suzukii	9	7	9
Ornamentals	Frankliniella occidentalis	5	5	8
Cabbage	Delia radicum	15	8	11
Carrot	Pythium sp.	6	5	9
Strawberry	Botrytis cinerea	7	5	9
Onion, dry bulb	Dicotyledonous plants	9	5	7
Currants	Cecidophyopsis ribis	11	5	7
Lettuce	Dicotyledonous plants	13	5	8

Calculated scores and ranking sorted by columns Score 1 and 2

A	C	F	G	H	I	J	K	L
Crop	Target, Scientific	= H * K = Score 1 priority needs (1...5)	= H * L = Score 2 all needs (x, 1...5)	= 1 / I reciprocal (1...5)	= J / K mean value priority needs (1...5)	sum values priority needs (1...5)	number priority needs reported (1...5)	number needs reported (x, 1...5)
Cherries	Drosophila suzukii	8.1	9.0	0.9	1.1	10	9	10
Raspberry	Drosophila suzukii	7.7	9.6	0.8	1.3	13	10	12
Carrot	Psila rosae	6.1	8.1	0.9	1.1	8	7	9
Strawberry	Drosophila suzukii	5.4	8.0	0.8	1.3	9	7	10
Blueberry	Drosophila suzukii	5.4	7.2	0.8	1.3	9	7	9
Ornamentals	Frankliniella occidentalis	5.0	8.0	1.0	1.0	5	5	8
Cabbage	Delia radicum	4.3	5.5	0.5	1.9	15	8	11
Carrot	Pythium sp.	4.2	7.2	0.8	1.2	6	5	9
Strawberry	Botrytis cinerea	3.6	6.3	0.7	1.4	7	5	9
Onion, dry bulb	Dicotyledonous plants	2.8	4.2	0.6	1.8	9	5	7
Currants	Cecidophyopsis ribis	2.3	2.8	0.4	2.2	11	5	7
Lettuce	Dicotyledonous plants	1.9	3.2	0.4	1.6	13	5	8

Final ranking of needs – example for Greenhouse

Score 1 priorities	frequency priorities	Score 2 all needs	frequency all needs	average value priorities	crop	target group	target, scientific	field, greenhouse	climate zone	potential solution type
5,0	5	8,0	8	1,0	Ornamentals	Thrips	Frankliniella occidentalis	field / greenhouse	temperate / tropical	Insecticide
3,2	4	4,8	6	1,3	Currants	Fruit flies	Drosophila suzukii	field / greenhouse	temperate	Insecticide
3,0	3	7,0	7	1,0	Cucumber	Downy mildew	Pseudoperonospora cubensis	greenhouse	temperate	Fungicide
2,7	4	6,0	9	1,5	Lettuce	Downy mildew	Bremia lactucae	field / greenhouse	temperate	Fungicide
2,7	4	4,0	6	1,5	Strawberry	Mites	Tetranychus urticae	field / greenhouse	temperate	Acaricide
2,5	5	3,5	7	2,0	Strawberry	Mites	Phytonemus pallidus	field / greenhouse	temperate	Acaricide
2,3	3	5,4	7	1,3	Fresh herbs	Thrips	Frankliniella occidentalis	greenhouse	temperate	Insecticide
2,3	3	3,1	4	1,3	Gooseberry	Fruit flies	Drosophila suzukii	field / greenhouse	temperate	Insecticide
2,0	2	6,0	6	1,0	Fresh herbs	Aphids	Aphididae	field / greenhouse	temperate / tropical	Insecticide
2,0	2	6,0	6	1,0	Ornamentals	Thrips	Thysanoptera	field / greenhouse	temperate / tropical	Insecticide
2,0	2	6,0	6	1,0	Pepper, sweet	Aphids	Aphididae	greenhouse	temperate / tropical	Insecticide
2,0	2	5,0	5	1,0	Ornamentals	Mealybugs	Planococcus citri	field / greenhouse	temperate / tropical	Insecticide
2,0	4	4,5	9	2,0	Tomato	Whiteflies	Trialeurodes vaporariorum	greenhouse	temperate / tropical	Insecticide
2,0	4	4,0	8	2,0	Broccoli	Flies	Delia radicum	field / greenhouse	temperate	Insecticide
2,0	4	4,0	8	2,0	Cucumber	Mites	Tetranychidae	greenhouse	temperate	Acaricide
2,0	2	4,0	4	1,0	Fresh herbs	Weeds	Angiospermae	field / greenhouse	temperate / tropical	Herbicide
2,0	2	3,0	3	1,0	Celery	Thrips	Thrips tabaci	field / greenhouse	temperate	Insecticide
2,0	2	3,0	3	1,0	Fresh herbs	Weeds	Senecio vulgaris	field / greenhouse	temperate	Herbicide
1,8	4	2,2	5	2,3	Strawberry (organic)	Weevils	Anthonomus rubi	field / greenhouse	temperate	Insecticide
1,8	3	5,3	9	1,7	Lettuce	Pythium	Pythium sp.	greenhouse	temperate	Fungicide
1,8	3	4,1	7	1,7	Onion, green	Downy mildew	Peronospora destructor	field / greenhouse	temperate	Fungicide
1,5	3	2,5	5	2,0	Cucumber	Powdery mildew	Erysiphe cichoracearum	greenhouse	temperate	Fungicide
1,5	3	2,5	5	2,0	Ornamentals	Whiteflies	Bemisia tabaci	field / greenhouse	temperate / tropical	Insecticide
1,5	3	2,5	5	2,0	Strawberry	Nematodes	Nematoda	field / greenhouse	temperate	Nematicide
1,3	2	5,3	8	1,5	Cauliflower	Flies	Delia radicum	field / greenhouse	temperate	Insecticide
1,3	2	4,0	6	1,5	Pepper, sweet	Whiteflies	Trialeurodes vaporariorum	field / greenhouse	temperate / tropical	Insecticide
1,3	2	4,0	6	1,5	Pepper, sweet	Whiteflies	Bemisia tabaci	field / greenhouse	temperate / tropical	Insecticide
1,3	2	3,3	5	1,5	Brussels sprouts	Flies	Delia radicum	field / greenhouse	temperate	Insecticide

**Further means to make a decision –
Most frequently reported Pest Group, example Greenhouse**

Sum Tagret Reported in Greenhouse	Target Group	Potential Solution Type
113	Aphids	Insecticide
105	Thrips	Insecticide
93	Mites	Acaricide
91	Whiteflies	Insecticide
91	Powdery mildew	Fungicide
67	Downy mildew	Fungicide
56	Flies	Insecticide
55	Botrytis	Fungicide
55	Bacteria	Bactericide
46	Weeds	Herbicide
32	Nematodes	Nematicide
31	Fusarium	Fungicide
29	Caterpillars	Insecticide
28	Verticillium	Fungicide

Further means to make a decision – Most frequently reported Species, example Tropical Zone

Sum Tagret reported in Tropical Zone	Target Species	Target Group	Potential Solution Type
35	Bemisia tabaci	Whiteflies	Insecticide
32	Frankliniella occidentalis	Thrips	Insecticide
27	Tetranychus urticae	Mites	Acaricide
24	Dicotyledonous plants	Weeds	Herbicide
24	Angiospermae	Weeds	Herbicide
22	Ceratitis capitata	Fruit flies	Insecticide
19	Trialeurodes vaporariorum	Whiteflies	Insecticide
19	Phytophthora sp.	Phytophthora	Fungicide
19	Monocotyledonous plants	Weeds	Herbicide
16	Myzus persicae	Aphids	Insecticide
15	Botrytis sp.	Botrytis	Fungicide
14	Glomerella cingulata	Anthraxnose	Fungicide
14	Meloidogyne sp.	Nematodes	Nematicide
13	Leveillula taurica	Powdery mildew	Fungicide
12	Aphididae	Aphids	Insecticide
12	Planococcus citri	Mealybugs	Insecticide
12	Bactrocera sp.	Fruit flies	Insecticide