



Shortcut values (SVs) and exposure factors (Ef)

EFSA Guidance Document on the Risk Assessment of Plant Protection Products on bees (*Apis mellifera*, *Bombus* spp. and solitary bees)

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Where are the SVs?

- Tables J3 to J7 in Appendix J (page 153 onwards) contain all SVs to be used for the screening step and in the 1st tier risk assessment
- An example how they look like:

Category	Input parameters					SV (μg)		
	Pollen consumption (mg/bee/day or mg/larvae)	Range or value for the sugar consumption (mg/bee/day or mg/larvae)	Sugar content of nectar (%)	Median \pm SD of RUDs in pollen	Median \pm SD of RUDs in nectar	Crop attractive for pollen and nectar	Crop attractive for pollen, only	Crop attractive for nectar, only
HB forager acute	–	80–128	15	–	2.478 \pm 1.153	7.55	–	7.55
HB forager chronic	–	32–128	15	–	2.478 \pm 1.153	5.8		5.8
HB nurse	12	34–50	15	13.02 \pm 1.386	2.478 \pm 1.153	3.78	0.92	–
HB larva	2	59.4	15	13.02 \pm 1.386	2.478 \pm 1.153	4.4	0.15	4.3
BB adult acute	30.3	111–149	15	13.02 \pm 1.386	2.478 \pm 1.153	11.2	2.3	9.5
BB adult chronic	30.3	73–149	15	13.02 \pm 1.386	2.478 \pm 1.153	9.9		8.1
BB larva	39.5	23.8	15	13.02 \pm 1.386	2.478 \pm 1.153	4.4	3.0	1.7
SB adult	10.2	18–77	10	13.02 \pm 1.386	2.478 \pm 1.153	5.7	0.79	5.2
SB larva	387	54	10	13.02 \pm 1.386	2.478 \pm 1.153	34	30	5.9

What are the SVs?

- They express worst case theoretical residue intake via pollen and nectar
- The unit is μg  SVs tell us how many μg of residues can orally be taken up by an adult bee during a day or by a larva during its full developmental period. For HB larva the SVs were calculated for 5 days, for SB larva for 30 days, but for BB larva is only for 1 day (!).
- SVs assume an application rate of 1 kg/ha, or the seed dressing rate of 1 mg/seed (this latter only for the treated crop for seed treatment uses)

What are the SVs?

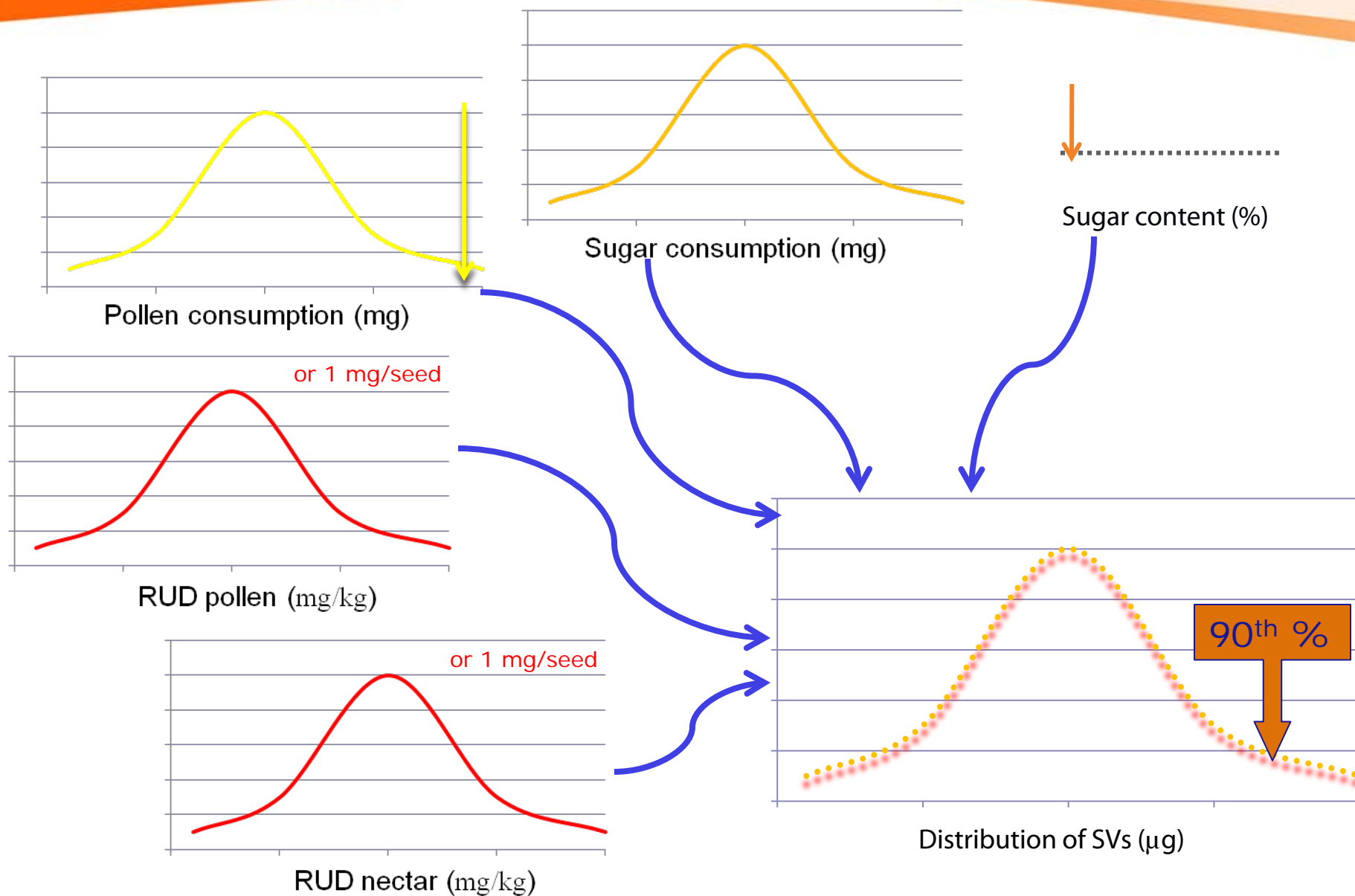
- An example for crop scenarios (one type of plant):

Category	Input parameters					SV (μg)		
	Pollen consumption (mg/bee/day or mg/larvae)	Range or value for the sugar consumption (mg/bee/day or mg/larvae)	Sugar content of nectar (%)	Median \pm SD of RUDs in pollen	Median \pm SD of RUDs in nectar	Crop attractive for pollen and nectar	Crop attractive for pollen, only	Crop attractive for nectar, only
HB forager acute	–	80–128	15	–	2.478 \pm 1.153	7.55	–	7.55
HB forager chronic	–	32–128	15	–	2.478 \pm 1.153	5.8	–	5.8
HB nurse	12	34–50	15	13.02 \pm 1.386	2.478 \pm 1.153	3.78	0.92	–
HB larva	2	59.4	15	13.02 \pm 1.386	2.478 \pm 1.153	4.4	0.15	4.3
BB adult acute	30.3	111–149	15	13.02 \pm 1.386	2.478 \pm 1.153	11.2	2.3	9.5
BB adult chronic	30.3	73–149	15	13.02 \pm 1.386	2.478 \pm 1.153	9.9		8.1
BB larva	39.5	23.8	15	13.02 \pm 1.386	2.478 \pm 1.153	4.4	3.0	1.7
SB adult	10.2	18–77	10	13.02 \pm 1.386	2.478 \pm 1.153	5.7	0.79	5.2
SB larva	387	54	10	13.02 \pm 1.386	2.478 \pm 1.153	34	30	5.9

- The values for habitats with mixed wild plants:

Category	Input parameters					SV (μg)
	Range of pollen consumption (mg/bee/day or mg/larvae)	Range of sugar consumption (mg/bee/day or mg/larvae)	Sugar content of nectar (%)	Median \pm SD of RUDs in pollen	Median \pm SD of RUDs in nectar	
HB forager acute	–	80–128	30	–	2.478 \pm 1.153	3.78
HB forager chronic	–	32–128	30	–	2.478 \pm 1.153	2.9
HB nurse	6.5–12	34–50	30	13.02 \pm 1.386	2.478 \pm 1.153	2.12
HB larva	1.5–2	59.4	30	13.02 \pm 1.386	2.478 \pm 1.153	2.2
BB adult acute	26.6–30.3	111–149	30	13.02 \pm 1.386	2.478 \pm 1.153	6.5
BB adult chronic	26.6–30.3	73–149	30	13.02 \pm 1.386	2.478 \pm 1.153	5.9
BB larva	10.3–39.5	23.8	30	13.02 \pm 1.386	2.478 \pm 1.153	2.6
SB adult	10.2	18–77	30	13.02 \pm 1.386	2.478 \pm 1.153	2.4
SB larva	387	54	30	13.02 \pm 1.386	2.478 \pm 1.153	31

How were the SVs derived?



Which SV to be used where?

- Different tables for different scenarios:

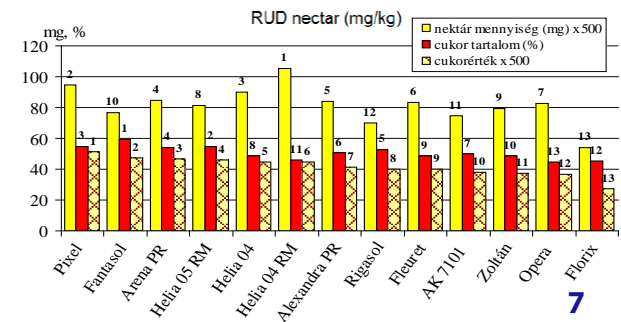
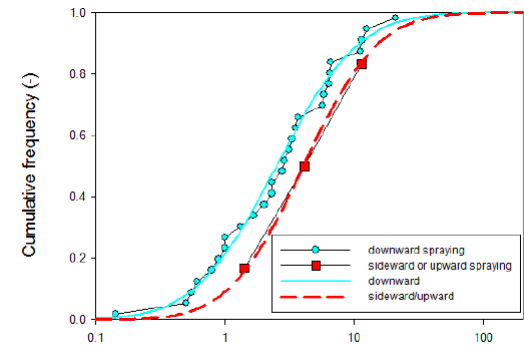
Scenario	Application method	Table
treated crop	downward spraying; broadcasted granules after emergence	Table J4
	side/upward spraying	Table J5
	seed treatment; granules before emergence (soil application)	Table J6
adjacent crop	all	Table J4
succeeding crop/permanent crop in the next year	all	Table J6
weeds in the field and plants at the field margin	all	Table J7

Can SVs be refined?

Yes ; before planning effect field studies, the use of refined SVs in a 2nd tier assessment is an option

How could this be done?

- Refine pollen consumption (might be difficult, no detailed guidance)
- Residue measurements
- Sugar content measurements



Where are the Ef values?

- Table X1 in Appendix X (page 252/253) contains the Ef factors to be used in the lower tier risk assessments

Application technique (risk assessment scheme)	Scenario	Deposition factor (f_{dep})	Dust formation factor	Safety factor	Exposure factor (-)
Spray application	Weeds in the field	Take f_{dep} value from table X2	–	-	f_{dep}
	Plants at the field margin	Field crops: 0.0092 Early fruit: 0.097 Late fruit: 0.052 Early grapevine: 0.009 Late grapevine: 0.027 Hops: 0.064	–	–	Field crops: 0.0092 Early fruit: 0.097 Late fruit: 0.052 Early grapevine: 0.009 Late grapevine: 0.027 Hops: 0.064
	Adjacent crop	Field crops: 0.0033 Early fruit: 0.066 Late fruit: 0.031 Early grapevine: 0.0047 Late grapevine: 0.0143 Hops: 0.041	–	–	Field crops: 0.0033 Early fruit: 0.066 Late fruit: 0.031 Early grapevine: 0.0047 Late grapevine: 0.0143 Hops: 0.041
Seed treatment*	Plants at the	Maize with deflector:	–	3	Maize with deflector:

What are the Ef values?

- They are simply a collection of factors, which are considered in the exposure estimation for relevant scenarios (e.g. spray drift for field margin)
- They are unit less and all considerable less than 1 (therefore they all will lower the exposure element of the risk assessment)
- For scenarios where there is no Ef indicated in table X1, Ef value must not be used or it can automatically be considered to be 1 (e.g. for the treated crop which is over sprayed, the full dose will be considered)

How were the Ef values derived?

- Three kinds of factors are considered for exposure estimations for certain scenarios:
 - Deposition factor:
 - the fraction of the applied dose deposited onto weeds in the treated field
 - the fraction of the applied dose deposited to off-crop plants (spray-drift, dust-drift)
 - Dust formation factor (only for granules)
 - Safety factor (only for solid formulations; it is an extrapolation factor from spray to solid)
- The Ef values are simply the multiplication of these three factors

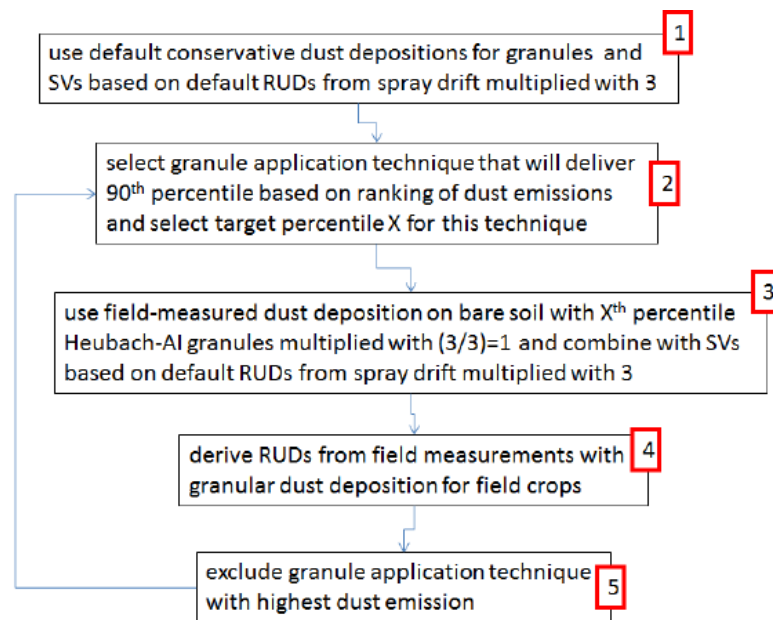
Can Ef values be refined?

Yes ; several elements can be refined

How could this be done?

Options are described in the exposure assessment chapter (esp. Appendix N, page 178 onwards)

An example for granules:





Thank you for your attention!