

Sowing rates: regulatory implications of working on realistic sowing rates

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Euroseeds Workshop on Seed Treatment Guidance Document



Outline

- Sowing rate data as per the seed treatment guidance document (v19)
- Regulatory recommendations regarding sowing rates
- Implications for the risk assessment
- Conclusions

Sowing rate data as per the seed treatment guidance document (v19)

Appendix IV. Overview of maximum and maximum common sowing rates seed sowing rates for different crops

Source: EPPO Survey on dose expression and authorized dose, EPPO Bulletin (2016) 46 (3), 618–624).

Crop	Maximum seed sowing rate		Maximum commonly used seed sowing rate		Average thousand grain weight (g)
	(kg/ha)	(no. seeds/ha)	(kg/ha)	(no. seeds/ha)	
Maize ZEAMX	70	150 000	30	110 000	160-420
Winter oil seed rape BRSNW	9	1 600 000	6	900 000	3-9
Spring Oilseed rape BRNS	12.6	2 600 000	10	2 000 000	2-10
Sunflower HELAN	30	225 000	30	200 000	50-200
Winter wheat TRZAW	400	7 000 000	260	6 500 000	31-61
Spring wheat TRZAS	400	7 000 000	280	7 000 000	30-55
Winter Durum wheat TRZAW	275	6 000 000	220	5 000000	40-60
Spring Durum Wheat TRZAW	275	6 000 000	220	6 000 000	35-60
Winter barley	300	6 000 000	250	6 000 000	30-59

- Seed Treatment Guidance Document (Sanco/10553/2012 rev 16) recommends the use of **Maximum Commonly Used seed sowing rates** for risk assessment purposes

Summary of sowing rate data collected in the Kynetec survey

		EPPO, 2016		Kynetec, 2020 (2019 for WW)		
		Max. rate	Max. common rate	Avg rate	Median rate	90th %ile
Maize	Unit size					
	Thsd sd/ ha	150	110	82		
	Grain use Thsd sd/ ha			76	74	93
	Silage use Thsd sd/ ha			91	93	100
W-OSR	Thsd sd/ ha	1.600	900	501		
	Hybrids Thsd sd/ ha			468	480	600
	Varietals Thsd sd/ ha			668	495	750
Sunflower	Thsd sd/ ha	225	200	64	65	75
W-Wheat	kg/ ha	400	260	202		
	Certified sd kg/ ha			200	186	250
	Farm saved sd kg/ ha			207	190	277

- For some crops, even 90th percentile is significantly different to the maximal common sowing rate
- Implications for the conduct of a risk assessment, and where triggered, high-tier studies

How is the sowing rate used in the regulatory context?

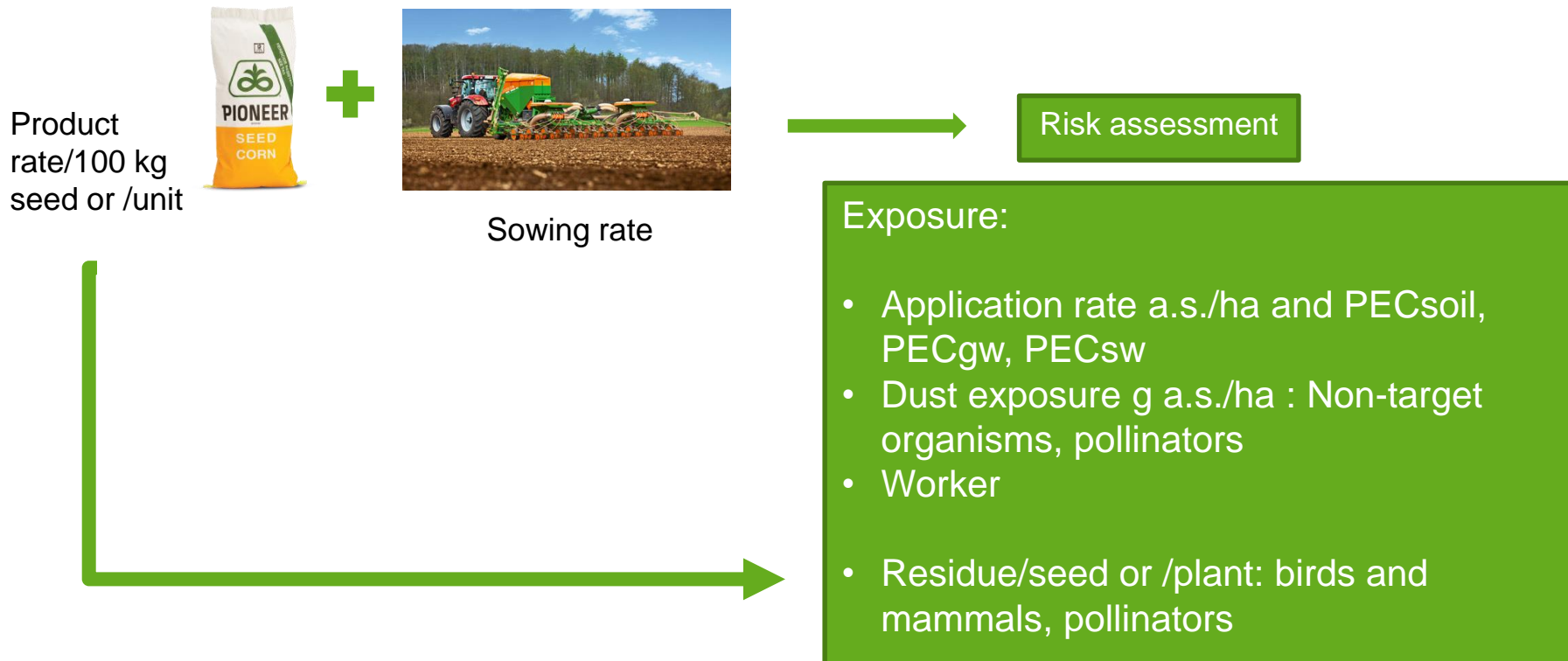
Appendix IV of Sanco 10553/2012 rev 19:

Field of use: fungicide, insecticide etc for seed treatment

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: (f)
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between sowing (in greenhouse) and transplanting to the field (days)	kg or L product per 100 kg seeds or per unit of [number] of seeds	Maximum sowing density (kg seeds/ha or units of [number] of seeds/ha)	Maximum g or kg a.s./ha		
Interzonal uses (use as seed treatment) (indicate here if seeds are destined for export purposes only)													
			I or G or F (treatment of seeds)			Seed treatment at BBCH 00.	1						
			G or F (sowing)			BBCH 00 +							



How is the sowing rate used in the regulatory context?



Sowing rate: ex of oil seed rape

Ex Oil Seed Rape

- Maximum Commonly Used Sowing Rate:
 - 900,000 seeds/ha (Winter OSR)
 - 2,000,000 seeds/ha (Spring OSR)
- Kynetec survey: 600,000 seeds/ha, hence **1.5 to 2.2 times lower than the EPPO value**

Sowing rate and environmental compartments

Ex Oil Seed Rape

- Implications of an application rate in a.s./ha lowered by 1.5 to 2.2:
 - PEC soil directly proportionally reduced
 - Transfers to groundwater also directly proportionally reduced

- Implications for soil organisms where Toxicity/Exposure Ratio (TER) is just below 5, which triggers high tier studies or even post registration monitoring
- For groundwater, where modelling gives PEC_{gw} just above 0.1 µg/L. leading to restrictions on the frequency of use in a rotation
- A number of data is usually needed to refine entry parameters in groundwater and surface water models, making it is **critical** to get the application rate right

Sowing rate and worker exposure



■ Implications for worker exposure during sowing

■ **The total amount of seed sown per day** is a critical parameter for the assessment of daily exposure to workers involved in the sowing of treated seed:

– Worker exposure depends on the amount of active ingredient handled per day which is calculated from the amount of seed sown and application rate on the seed.

■ **Higher sowing rate will require longer seed loading time**, and the size of area sown per day will be reduced as the sowing machine will have to dispatch more seeds.

– Although large farms have very fast sowing machines, the sowing rate is much lower.

■ **The use of high sowing rate in conjunction with large areas sown per day is not realistic.**

➤ Such assumption would result in significant overestimation of worker exposure and further requirement for unnecessary mitigation measures such as additional PPE/RPE, label restrictions or high tier studies.

Sowing rate and exposure via dusts

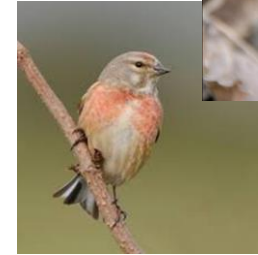
Ex Oil Seed Rape

- Exposure via dusts: implications non-target organisms
 - A factor of 1.5 or 2.2 in the sowing rate leads to a proportional increase of dust/ha
 - Non-target arthropods, pollinators: the highly conservative 2D and 3D factors easily trigger refined risk assessments involving dust field studies, currently not covered by international testing guidelines, nor recommendations regarding which sowing rates or material to use.

- Restrictions relative to dust quality and or sowing density
- Triggers additional work to reformulate recipes used to coat seeds, potentially adding more stickers*, which can interfere with germination
- Ongoing work on dust drift modelling

* Implications due to the new requirements for “microplastics”

Sowing rate and exposure via dusts



Ex Oil Seed Rape

- In field exposure of birds and mammals or pollinators
 - Birds and mammals exposure is dietary and relates to the amount of active substance/PPP per seed/seedling
 - Seeds are buried
 - Is the seedling density a significant factor in crop attractiveness?
 - Relevant for pollinators when exposed to residue concentrations in nectar/pollen or guttation
- Differences in sowing density are unlikely to affect dietary exposure, as the number of individuals is largely outnumbered by the seed/plant density per hectare
- In those particular cases, extrapolations in the risk assessment across Member States where sowing rates differ should be facilitated, for both low-tier risk assessment, and high-tier studies involving field studies

Crops for which significant differences in sowing rates are observed

- Oil seed rape: 1.5 to > 2 x lower than the EPPO values
- Sunflower: 2.7 times lower than the EPPO values
- Corteva data:
 - Rye (2.3x), oats (1.3-2.1x), lupin (1.1-2.8x), linseed (1.5-2x)
 - Vegetables:
 - Green beans (1.8-2.7x)
 - Peas (1.4-2.8x)
 - Spinach (4x)
- Amongst other implications, facilitation to address gaps for minor uses

Conclusions

- **GAPs for seed treatments are very specific**
- **The ongoing work by the EU Commission and EFSA provide an opportunity to review the current proposed value for sowing rates to be used in the risk assessment**
- **The level of conservatism used to maintain a high level of protection and safety through the risk assessment does not leave margin to account for uncertainty regarding sowing practice, particularly where data are collected and available**
- **Realism in sowing rates would avoid unnecessary studies, restrictions and refusals of authorisations, and would reconcile risk assessment to field conditions of use**
- **Implications for access to market of seed treatment solutions for minor uses**
- **Implications for biological solutions developed as seed treatment, evaluated so that to meet the same safety standards**

Thank you for your attention!



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15