

FS Section	Content field
1. Title	1.1 Title of SPERC: Outdoor use - direct application of solid or liquid fertilizers to soil; incorporation, placement, mixing, seed treatment, drip irrigation
	1.2 SPERC code: Fertilizers Europe SPERC 8e.2.v1
2. Scope	2.1 Substance/Product Domain
	Substance types / functions / properties included or excluded: Solid and liquid fertilizers containing environmentally hazardous components (e.g. manganese, copper and zinc substances; both organic and inorganic substances are covered).
	Additional specification of product types covered: Solid and liquid fertilizers intended for outdoor use (in a.o. agriculture, forestry, horticulture, gardens, golf courses) by consumers and professionals. Farmers are considered professional users. The use of fertilizers in enclosed structures is covered when crops are cultivated in contact with the soil (e.g. non-permanent covers, walk-in tunnels and nurseries). In this case, outdoor use represents a worst-case for environmental exposure. High-tech greenhouse structures, with no direct soil contact and closed water circulation systems are not covered by the Fertilizers Europe SPERCs.
	Inclusion of sub-SPERCs: No
	2.2 Process domain
	Description of activities/processes: Local scale, outdoor use of solid and liquid fertilizers on agricultural soil by incorporation, placement, mixing, seed treatment and drip irrigation is covered.
	The Fertilizers Europe SPERCs cover both the application stage, as well as the preceding mixing and loading step and the subsequent cleaning of equipment of the fertilizer uses. Emissions from formulation and re-packaging at industrial manufacturing sites are not addressed by the Fertilizers Europe SPERCs.
	Application methods, substance properties, crop types, timing of application and yield scenarios are important in order to estimate environmental exposure; further refinements of the local assessment by SPERCs can be made using the Fertilizers Environmental Exposure (FEE) tool, as available on the Fertilizers Europe website http://www.reachfertilizers.com/
	Since the standard REACH models for environmental exposure assessment (ECETOC TRA, EUSES, Chesar) do not include appropriate scenarios and processes for direct fertilizer application to soil, the FEE tool is recommended to be used in quantitative environmental exposure assessment of fertilizer substances instead of the standard REACH models.
	2.3 List of applicable Use Descriptors
LCS: PW, C (Widespread use by professional workers; Consumer use)	
SU: 1 (Agriculture, forestry, fishery)	
PC: 12 (Fertilizers)	
3. Operational conditions	3.1 Conditions of use
	Location of use: Outdoor
	Water contact during use: No
	Connected to a standard municipal biological STP: No
	Rigorously contained system with minimisation of release to the environment: No
	Further operational conditions impacting on releases to the environment: Outdoor use [OOC01] Controlled application to agricultural soil [OOC25]
	3.2 Waste Handling and Disposal
	Waste Handling and Disposal: Dispose of waste product or used containers according to local regulations. Service life is not applicable to fertilizers.

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4. Obligatory RMMs onsite	RMM limiting release to air: None
	RMM Efficiency (air): N/A
	Reference for RMM Efficiency (air): N/A
	RMM limiting release to water: It is assumed that operators will comply with best agricultural practice.
	RMM Efficiency (water): N/A
	Reference for RMM Efficiency (water): N/A
	RMM limiting release to soil: None, intentionally released to agricultural soil.
	RMM Efficiency (soil): N/A
	Reference for RMM Efficiency (soil): N/A
5. Exposure Assessment Input	5.1 Substance use rate
	Amount of substance use per day: Assessment defaults as set by ERC 8e. It is recommended to use a realistic substance use rate; guidance can be found in the Fertilizers Europe SPERC background document.
	Fraction of EU tonnage used in region: Not relevant.
	Fraction of Regional tonnage used locally: Not relevant.
	Justification / information source: Guidance can be found in the Fertilizers Europe SPERC background document.
	5.2 Days emitting
	Number of emission days per year: 1-5 applications per year; depending on crop type and agricultural soil characteristics.
	Justification / information source: Guidance can be found in the Fertilizers Europe SPERC background document.
	5.3 Release factors
	sub-SPERC identifier: N/A
	ERC: 8e
	sub-SPERC applicability: N/A
	5.3.1 Release Factor – air
	Numeric value / percent of input amount (Air): 0%
	Justification of RFs (Air): Volatilization to air is not relevant for solid fertilizers, soil improvers or related products. For liquids, volatilization can take place during application depending on the vapour pressure of the substance. In this case, emissions to air could lead to aerial deposition on (agricultural) soil. This pathway is considered to be covered by the release factors to soil, since for all SPERCs this was set to 100%. Therefore, releases to air are considered not relevant for the environmental exposure assessment of fertilizers, soil improvers and related products and this release factor is 0%.
	5.3.2 Release Factor – water
	Numeric value / percent of input amount (Water): 0%
Justification of RFs (Water): The only potential for direct release to surface water is by spray drift during application. This is not a relevant parameter for direct precision application of solid and liquid fertilizers on agricultural soil by incorporation, placement, mixing, seed treatment and drip irrigation. Release to water is therefore considered 0%.	

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	<p data-bbox="347 293 568 320">5.3.3 Release Factor – soil</p> <p data-bbox="347 353 932 380">Numeric value / percent of input amount (Soil): 100% (agricultural soil)</p> <p data-bbox="347 414 1428 495">Justification of RFs (Soil): Direct application to agricultural soil, intentional release. As a conservative approach, it is assumed that 100% of the fertilizer substance applied can be released to soil. This was based on the consideration that fertilizers are applied directly onto/into soil or on the foliage of crops, in order to promote growth of cultivated crops.</p> <p data-bbox="347 510 1310 537">Further details on release factors to the environment can be found in the Fertilizers Europe SPERC background document.</p> <p data-bbox="347 553 1428 607">A fertilizer environmental exposure (FEE) tool was developed for environmental fate modelling and quantitative risk assessment of fertilizer substances and soil improvers. This tool can be downloaded at: http://www.reachfertilizers.com/</p> <p data-bbox="347 640 587 667">5.3.4 Release Factor – waste</p> <p data-bbox="347 701 1262 728">Percent of input amount disposed as waste: 0.01% (OECD Emission scenario document plastic additives, 2009).</p> <p data-bbox="347 761 528 788">Justification of RFs:</p> <p data-bbox="347 804 975 831">Please refer to the OECD Emission scenario document plastic additives (2009).</p>
References to SPERC Background Document	
	<p data-bbox="347 929 1342 987">Fertilizers Europe (2017) Specific environmental release categories (SPERCs) for professional and consumer use of fertilizer substances – Background document: http://www.reachfertilizers.com/</p>