

Ammonia emissions from land spreading manures – Review of Guidance Document

EPMAN 2

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EPMAN 1

- Land Application group outcomes
 - Guidance document should drive the Code of Practice
 - But, Current Code of Practice is an older document?
 - No major changes required

- Decision
 - Review Guidance Document ([document ECE/EB.AIR/WG.5/2007/13](#)) before amending Code of Practice ([document EB.AIR/WG.5/2001/7](#))

Proposed changes to Guidance Document

1. More text regarding other potential loss pathways (avoid pollution swapping)
2. Clarification of terms and description of application techniques
3. Ammonia reduction efficiencies
 - More ranges rather than single figures
 - Discussion of factors that influence ranges
 - Include models for ranges (where appropriate)
4. Costs
 - Remove €/m³ costings
 - Replace with relative costs / ranking basis
5. Revisit category 1, 2 and 3 classifications
6. Include literature references

Progress to Date

1. More text regarding other potential loss pathways (avoid pollution swapping)

– Already mentioned in paragraph 21

“Lowering NH₃ emissions may increase the amount of N available for plant uptake, so mineral N fertilizer application rates may need to be adjusted. Some techniques may temporarily decrease crop yield (especially of grass) through mechanical damage. There is also potential for increasing N losses by other pathways, e.g. nitrate leaching, nitrification or denitrification, the latter two processes resulting in greater emissions of nitrous oxide (N₂O).”

– Timing of application for maximum crop N uptake (paragraph 17)

- Not necessarily going to help reduce NH₃ emissions
- Will help reduce nitrate and N₂O losses

– Further inclusions ??

- N₂O - Injection vs. incorporation (Webb review)

Progress to Date

2. Clarification of terms and description of application techniques
 - More descriptive text on machine classifications included
 - (e.g. band-spreading: trailing hose vs. trailing shoe)

Progress to Date

3. Ammonia reduction efficiencies

- Table 2(a)
- More ranges rather than single figures
 - Ranges included
- Discussion of factors that influence ranges
 - New column included
- Include models for ranges (where appropriate)
 - Scope for inclusion of equations / models
- Webb review

Abatement measure	Type of manure	Land use	Emission reduction (%)	Factors affecting emission reduction	Applicability	Estimated costs relative to reference
Trailing hose	Slurry	Grassland, arable land	20-30 Emission reduction may be less if applied on grass <10 cm.	Height of crop canopy	Slope (<15% for tankers; 25% for umbilical systems); not for slurry that is viscous or has a large straw content; size and shape of field should be considered.	1.4
Trailing shoe	Slurry	Mainly grassland	20-60**	Height of crop canopy	Slope (<15% for tankers; 25% for umbilical systems); not viscous slurry; size and shape of the field; grass height should be >8 cm.	1.6
Shallow injection (open slot)	Slurry	Grassland	70-80**	Slurry spillage out of injection slits	Slope <10%; greater limitations for soil type and conditions; not viscous slurry	1.8
Shallow injection (closed slot)	Slurry	Mainly grassland, arable land	80-90	Effective slit closure	Slope <10%; greater limitations for soil type and conditions; not viscous slurry	2.0
Broadcast application? and incorporation by plough in one process	Slurry	Arable land			Only for land that can be easily cultivated	
Broadcast application and incorporation by plough (costs for < 4 h)	Slurry	Arable land	50-60			
Incorporation by disc			60			
Broadcast application and incorporation by plough within 12 h	Slurry	Arable land	15		(according to § 10)	
Timing of application and weather conditions	Slurry	Grassland and arable	0-30	Lower wind speed, air temperature, and solar radiation; higher rainfall and relative humidity. Often associated with season (e.g. spring)	Dependent on availability of spreadland with suitable soil trafficability and herbage canopy conditions	1.0

Progress to Date

4. Costs

– Remove €/m³ costings

– Replace with relative costs / ranking basis

- Costing including (estimated scale relative to splashplate as reference method)
- Webb review

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Progress to Date

5. Revisit category 1, 2 and 3 classifications
 - Timing of application and weather conditions switched from category 2 into category 1
 - Reduce time for incorporation of surface applied manures/slurries to 4 hours

Progress to Date

6. Include literature references

- No progress to date
- Suggest to include in unobtrusive way
- Input from previous authors/reviewers of Guidance Document?

Completing the Review

Consensus required on a number of issues:

- Inclusion of references – who?
- More text on pollution swapping / co-benefits
- Decisions on: (Webb review + others)
 - Emission reduction ranges (+ models)
 - Costings and units to use
 - Category 1, 2 & 3 techniques