

MANURE MANAGEMENT IN CATTLE FARMS FROM TRANSILVANIA (ROMANIA)

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1 INTRODUCTION

Manure represents a valuable source for fertilization of agricultural land, but may represent a danger in case of bad management (short period of storage, unreasonable use). It may also contain various pathogens: *Salmonella*, *Listeria*, *E. coli* 0157, *Campylobacter*, *Mycobacterium* etc. (Burton and Turner, 2003). The amount of manure produced from cows, in kg/head/day, is between 30 and 45 for dairy cows, between 25 and 30 for beef cattle and between 14 and 30 for calves (Man and Ivan, 1999).

In Romania, the “Code of good agricultural practice for water protection against pollution by nitrates from agricultural source” (Ordin nr. 1270/2005), requires the storage of manure for minimum 4 months (17-18 weeks). A storage period of 5 months (23 to 24 weeks) is recommended if there is a risk of pollution when manure is spread on the soil, due to superficial flows or rapid internal drainage. In nitrate vulnerable areas storage will be required for a 6-month period (27 to 28 weeks).

This study aimed to highlight manure management in cattle farms from Transilvania (Romania).

2 MATERIALS AND METHODS

The research was conducted during June-September 2009, in 27 farms from 8 counties: Alba, Bihor, Bistrița-Năsăud, Brașov, Cluj, Mureș, Satu-Mare and Sibiu. Data were obtained by interviewing farmers and by observations on the spot.

14 of the farms were provided with tie-stalls shelters, while the others had free-standing stalls (cubicle house). 15 out of the 27 farms were located in nitrate vulnerable areas (Ordin nr.1552/743/2008). These areas (for Romania) are listed in figure 1 (ICPA Bucharest, 2009).

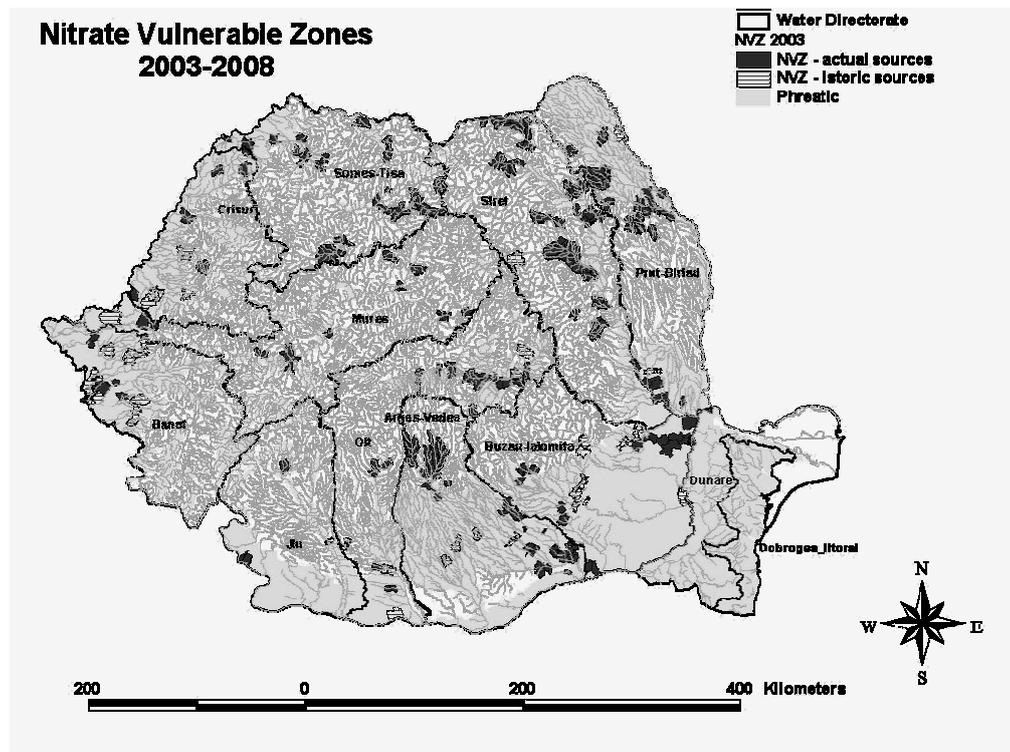


FIGURE 1 Romanian nitrate vulnerable zones (NVZ)

In figure 1:

NVZ-actual sources: the conditions of nitrate transfer to water bodies are favourable and at the level of the town there is a positive balance of nitrogen.

NVZ-historical sources: the conditions of nitrate transfer to water bodies are favourable, at the level of the town there is no positive balance of nitrogen, there used to be animal breeding units and the underground water nitrate concentration surpasses 50 mg/l.

3 RESULTS AND DISCUSSION

The data obtained in farms with tie-stalls shelters are presented in table 1.

TABLE 1 Tie-stalls shelters farms

Farm	Total no. of cattle	No. of dairy cows	Manure evacuation	Manure type	Manure storage (month)	Land available for fertilization (ha)	Dairy cows/ha
A*	62	42	manual	mixed	3-6	40	1.05
B*	30	30	manual	solid	4-6	80	0.37
C*	233	113	automatic scraper	solid	12	1000	0.11
D	450	200	automatic scraper	solid	12	600	0.33
E*	1000	300	automatic scraper	solid	6	2000	0.15
F*	235	64	flushing	slurry	6	70	0.91
G*	69	41	manual	solid	6	65	0.63
H	98	44	manual	mixed	4	200	0.22
I*	40	16	manual	solid	6	-	-
J	156	56	manual	solid	12	20	2.8
K	90	47	manual	mixed	6	25	1.88
L*	70	30	manual	solid	6	40	0.75
M	73	37	manual	solid	6	20	1.85
N*	68	32	manual	solid	12	10	3.2

* = farms placed in nitrate vulnerable areas

The data obtained in farms with free-standing stalls (cubicle house) are presented in table 2.

From the farms studied, manure evacuation was manually done in 11 of them and by mechanical means (automatic scraper or tractor mounted scraper) in other 15. The process was performed by the flushing method in only one of the studied farms. In those farms where manure evacuation was manually performed, this activity was more difficult than in the other farms. This is due to the fact that a significant percentage of the personnel's labour force has been directed towards the evacuation of waste.

In figure 2 the farms distribution according to the method of manure evacuation is presented.

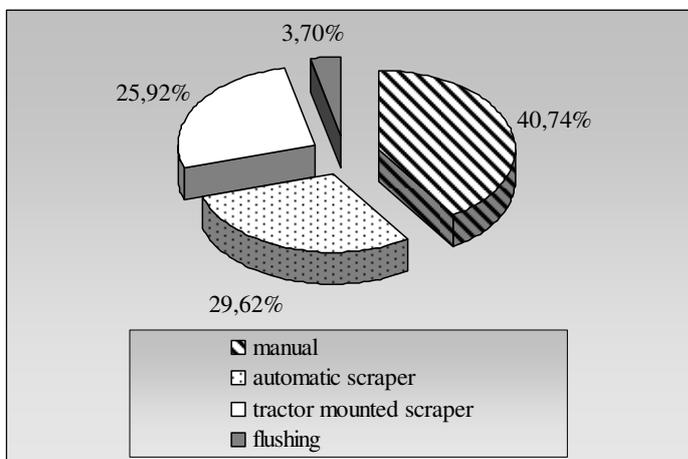


FIGURE 2 Methods of manure evacuation

TABLE 2 Cubicle house farms

Farm	Total no. of cattle	No. of dairy cows	Manure evacuation	Manure type	Manure storage (month)	Land available for fertilization (ha)	Dairy cows/ha
A'	690	332	automatic scraper	slurry	6	400	0.83
B'	120	60	tractor mounted scraper	solid	12	120	0.5
C'*	230	94	tractor mounted scraper	solid	6	130	0.72
D'*	70	40	automatic scraper	slurry	6	60	0.66
E'*	262	119	automatic scraper	slurry	6	50	2.38
F'	420	150	tractor mounted scraper	solid	6	700	0.21
G'*	56	30	manual	solid	3	-	-
H'*	196	92	tractor mounted scraper	solid	2	100	0.92
I'*	700	420	tractor mounted scraper	solid	6	-	-
J'	150	90	automatic scraper	slurry	4-5	50	1.8
K'	180	90	tractor mounted scraper	solid	2	40	2.25
L'	28	9	tractor mounted scraper	solid	3	20	0.45
M'	89	60	automatic scraper	slurry	2	50	1.2

* = farms placed in nitrate vulnerable areas

Manure storage period was between 2 and 12 months. Figure 3 presents the percentage distribution of farms according to manure storage period.

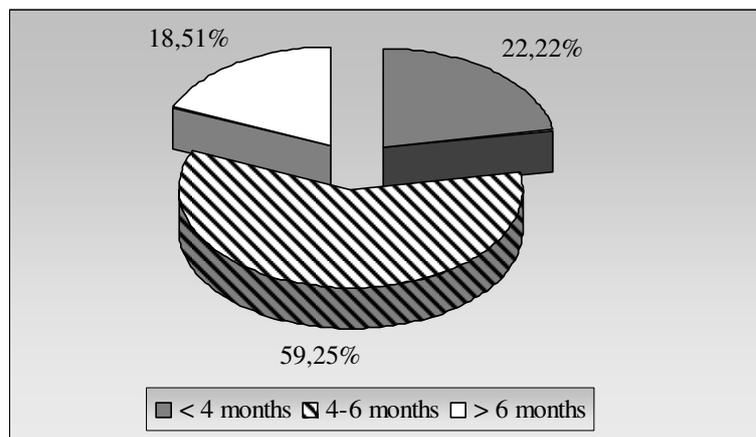


FIGURE 3 Manure storage period

It was found that in 5 out of the 27 farms considered for the study (farms G', H', K', L', M') manure storage period was not respected (2 of the 5 are located in nitrate vulnerable areas). In other 2 farms (A and B), also located in vulnerable areas, storage period was sometimes lower than the minimum required in such cases.

The percentage distribution of the farms according to compliance (YES), failure (NO) or partial compliance (NO/YES) with the required storage periods is presented in figure 4.

Although the data available has not allowed us to calculate the exact number of LU/ha, we can safely say that the maximum amount of 3 LU/ha has been surpassed in the farms of J, N, E' and K'.

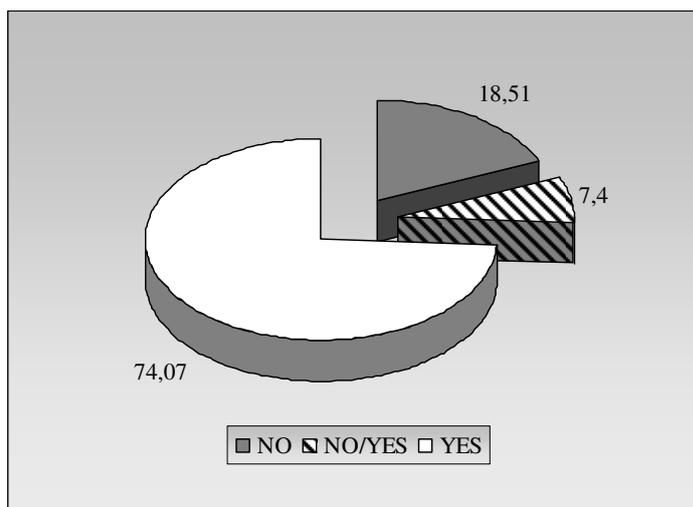


FIGURE 4 Compliance with the manure storage periods

4 CONCLUSIONS

There have been cases in which the manure storage time was not respected, even for farms located in nitrate vulnerable areas.

Manure management should be improved in some farms, both in terms of evacuation methods and of storage periods.

ACKNOWLEDGMENTS

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