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# Working Documents

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DOCUMENT 1-1137/83

REPORT

drawn up on behalf of the Committee on the Environment,  
Public Health and Consumer Protection

on the Proposal from the Commission of the European Communities  
to the Council (Doc. 1-673/82 - COM(82) 527 final) for a  
Directive on the use of sewage sludge in agriculture

Rapporteur : Mr A. BOMBARD



By letter of 16 September 1982 the President of the Council of the European Communities requested the European Parliament to deliver an opinion, pursuant to Articles 100 and 235 of the EEC Treaty, on the proposal from the Commission of the European Communities to the Council for a directive on the use of sewage sludge in agriculture.

On 11 October 1982 the President of the European Parliament referred this proposal to the Committee on the Environment, Public Health and Consumer Protection as the committee responsible and to the Committee on Agriculture for an opinion.

At its meeting of 19 October 1982 the Committee on the Environment, Public Health and Consumer Protection appointed Mr Bombard, rapporteur.

The committee considered the Commission's proposal and the draft report at its meetings of 17 March, 28 April and 21 June 1983.

At the last meeting the committee rejected the motion for a resolution by 5 votes to 5 with 4 abstentions.

A new resolution was drawn up by the rapporteur and presented to the committee at its meeting of 23 November 1983.

At this meeting, the committee decided by 10 votes to 7 with 3 abstentions to recommend that Parliament should adopt the Commission's proposal subject to the following amendments.

The committee also decided to reserve the right to propose that Parliament should apply Rule 36(2) of the Rules of Procedure.

The committee then unanimously adopted the motion for a resolution as a whole.

The following took part in the vote: Mr Collins, chairman; Mrs Weber, vice-chairman; Mr Bombard, rapporteur; Mr Alber, Mr Ceravolo (deputizing for Mr Spinelli), Mr Ghergo, Mr Johnson, Mrs Krouwel-Vlam, Mrs Lentz-Cornette, Mr Lynge (deputizing for Mrs Pantazi), Mr Mertens (deputizing for Mr Del Duca), Mr Petersen (deputizing for Mrs Seibel-Emmerling), Mr Provan (deputizing for Mr Forth), Mrs Pruvot (deputizing for Mr Berkhouwer), Mrs Schleicher, Dr Sherlock, Mrs Spaak, Mrs Squarcialupi, Mrs Van Hemeldonck and Sir Peter Vanneck (deputizing for Miss Hooper).

The opinion of the Committee on Agriculture is attached.

The report was submitted on 2 December 1983.

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The Committee on the Environment, Public Health and Consumer Protection hereby submits to the European Parliament the following amendments and motion for a resolution together with explanatory statement:

Amendments by the Committee on the Environment, Public Health and Consumer Protection

Text proposed by the Commission of the European Communities

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Proposal from the Commission of the European Communities to the Council for a directive on the use of sewage sludge in agriculture (Doc. 1-673/82)

Amendment No. 1

Amendment No. 1

Recital No. 10:

Recital No. 10:

"and whereas this provision should also apply to parks and playgrounds;"

"Whereas in order to safeguard human health, the spreading of sludge on crops which would come into direct contact with it and/or which are supplied raw to consumers must be prohibited and whereas this provision should also apply to woodland areas, parks and playgrounds;

(2 words deleted)

Amendment No. 2

Amendment No. 2

Recital No. 12:

Recital No. 12:

Delete

"Whereas sludge which is directly pumped or worked into the soil may be untreated;"

Amendment No. 3

Amendment No. 3

Article 2:

Article 2:

"Sewage treatment plants with a processing capacity of under 300 kg BOD<sub>5</sub> (raw) per day, corresponding to the equivalent values for a population of 5000, shall be excluded from the scope of this Directive, if throughout the year they treat only domestic effluent."

"Sewage sludge from treatment plants treating only urban or similar effluents and serving throughout the year a population of less than 5000 persons shall be excluded from the scope of this Directive."

Amendment No. 4

Article 7:

Without prejudice to Article 8:

- sludge shall be stabilized before being used in agriculture.

Amendment No. 5

Article 7 (new second indent)

- the producers of non-stabilized sludge shall provide all the necessary information and the test values for every consignment of sludge

Amendment No. 6

Article 8, point 1:

1. Member States shall prohibit the application of sludge in parks, playgrounds and woodlands. Special authorization for the application of sludge in woodlands shall be substantiated by special reasons.

Amendment No. 7

Article 8, point 2:

2. Grassland shall not be grazed and forage crops shall not be harvested for at least three months after the application of stabilized sludge.

Amendment No. 4

Article 7:

"Without prejudice to Article 8:

- sludge shall be stabilized before being used in agriculture; and
- non-stabilized sludge may be used only if it is immediately injected or worked into the soil."

Amendment No. 5

Article 7 (second indent)

- "- non-stabilized sludge may be used only if it is immediately injected or worked into the soil"

Amendment No. 6

Article 8, point 1:

- "1. Member States shall prohibit the application of sludge in parks, playgrounds and woodlands save where special authorization has been granted for special reasons."

Amendment No. 7

Article 8, point 2:

- "2. Grassland shall not be grazed and forage crops shall not be harvested for at least six weeks after the application of stabilized sludge."

Amendment No. 8

Article 9, second indent:

Delete second sentence  
( 'Member States shall ensure that the  
pH value of the soil does not fall below  
six after spreading.' )

Amendment No. 9

Article 11:

Add the following at the end of Article 11:

" The producers of sludge shall keep a  
record in which they shall enter at  
quarterly intervals:

- the quantities of sludge produced;
- its composition and properties;
- the additives and correctives necessary  
for direct use in agriculture;
- the origin of the effluent treated;
- the type of treatment carried out;
- the location and characteristics of  
the sites on which it is discharged."

Amendment No. 10

Article 12:

Where conditions so demand the Member  
States may take more stringent measures  
than those provided for in this directive.  
Such a decision shall be immediately  
communicated to the Commission and to  
the committee provided for in Article 14.

Amendment No. 8

Article 9, second indent:

"- sludge shall not be spread on soil with  
a pH value which will allow excessive  
mobility of the trace elements.  
Member States shall ensure that the pH  
value of the soil does not fall below  
six after spreading."

Amendment No. 9

Article 11:

"Member States shall ensure that a record  
is kept of the amounts of sludge produced,  
of the quantities supplied for use in  
agriculture, of the recipients, the  
methods of treatment and of the results  
of the analyses referred to in Article 10.

The record will provide a basis for the  
consolidated report referred to in  
Article 17.

Information on the methods of treatment  
and the results of the analyses shall  
be released upon request to farmers and  
competent bodies."

Amendment No. 10

Article 12:

"Where conditions so demand the Member  
States may take more stringent measures  
than those provided for in this directive."

Amendment No. 11

Article 17:

The first part of the text to read as  
follows:

"Two years after the notification of this  
Directive and every three years thereafter  
Member States shall prepare .....  
(remainder unchanged)

Amendment No. 11

Article 17:

"Five years after the notification of this  
Directive and every three years thereafter  
Member States shall prepare a consolidated  
report on the use of sludge in agriculture  
setting out the quantities applied and  
the percentage thereof on each type of soil,  
the criteria used and any difficulties  
encountered; they shall send the report to  
the Commission which shall publish the  
information contained therein"

## MOTION FOR A RESOLUTION

closing the procedure for consultation of the European Parliament on the proposal from the Commission of the European Communities to the Council for a directive on the use of sewage sludge in agriculture

### The European Parliament,

- having regard to the proposal from the Commission of the European Communities to the Council (COM (82) 527 final),<sup>(1)</sup>
  - having been consulted by the Council (Doc. 1-673/83),
  - having regard to the report by the Committee on the Environment, Public Health and Consumer protection and the opinion of the Committee on Agriculture, (Doc. 1-1137/83),
  - having regard to the result of the vote on the proposal from the Commission,
- A. Whereas the Action Programmes on the Environment provide for action to be taken to promote the recycling and re-use of waste;
  - B. Whereas it is undeniable that certain types of sewage sludge may be of particular use in agriculture;
  - C. Whereas the presence of trace elements in such sludge may present a danger to man and the environment;
  - D. Whereas, given the present state of advancement of the research work, it does not yet seem possible to fix limit values for the trace elements arsenic, cobalt, manganese and selenium, although studies are currently under way which will enable such values to be fixed within 3 years by the Committee for the adaptation of the directive;
1. Recognizes the considerable work that has been carried out by the experts in this field;

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(1) OJ No. C264, 8.10.1982, p.3

2. Considers that urgent attention must be given to the problem of the disposal of sewage sludge;
3. Acknowledges that sewage sludge may, under certain controlled conditions, be of use as a fertilising agent in agriculture;
4. Points out, however, that the use of untreated sewage sludge entails considerable risks and that noxious substances or germs may enter the food chain;
5. Considers that the proposals made by the Commission should be couched in more restrictive terms, to ensure adequate consumer protection, but that in many respects the proposals do not pay sufficient attention to considerable variations in climate, soil, crop types and disposal practices which exist across the Community;
6. Is particularly concerned, given the extreme significance of the mode of analysis in the case of the analyses prescribed, that uniform and binding procedures should be laid down for the taking and preparation of samples and the testing of sewage sludge and soil;
7. Calls on the Commission to examine as a matter of urgency and in a coordinated fashion other methods of disposal of sewage sludge which would be economically viable and acceptable environmentally ;
8. Calls on the Commission to supply as soon as possible sufficient scientific data to enable limit values to be set for arsenic, cobalt, manganese and selenium as trace elements and in respect both of the amounts which may be added to agricultural land and of the admissible concentrations in agricultural soil;
9. Calls on the Commission to revise its proposal, taking into account the amendments adopted by the European Parliament;
10. Instructs its President to forward to the Commission and the Council the proposal from the Commission as voted by Parliament and the corresponding resolution as Parliament's opinion.

EXPLANATORY STATEMENTINTRODUCTION

1. The present proposal for a directive falls within the framework of the Action Programmes on the Environment in so far as they provide that steps should be taken by the Community to promote the recycling and reuse of waste and to reduce the adverse effects of farming and forestry on the environment. The aim of the proposal as outlined by the Commission is two-fold:

- (a) to benefit agriculture and
- (b) to lay down rules for the proper use of sewage sludge in agriculture so that pollution may be avoided.

2. The Community currently produces  $6 \times 10^6$  tonnes/year of sewage sludge expressed as dry matter and it is estimated that the total amount produced by 1990 could be between 15 and  $20 \times 10^6$  tonnes/year. It is clear from this that the problem of disposal is becoming acute and one which demands urgent attention. At present 29% of sludge is used in agriculture, the rest being dumped on landfill sites, incinerated or dumped at sea.

3. In its explanatory statement the Commission outlines the legal situation concerning the disposal of sewage sludge in the Member States. From this it transpires that few countries have adopted specific provisions relating to the use of sewage sludge in agriculture. In most countries guidelines exist, mostly concerning the types of treatment of the sludge and the limitation of the amount of heavy metals which may be present. The Commission puts forward no convincing argument for the need for Community legislation in this area, simply stating that "disparity between Member States current provisions might create an imbalance in the conditions of competition."

## THE UTILIZATION OF SEWAGE SLUDGE FROM BIOLOGICAL TREATMENT PLANTS

4. Sewage sludge from treatment plants always comes from animal and human waste: there is thus a danger that pathogenic substances may enter the food chain bringing with them diseases transmittable to man. Only organic elements are taken into consideration - although they may be pathogenic - and no account is taken of chemical elements, namely heavy metals, pesticides and chemical fertilizers which have not undergone biological transformation.

5. It is therefore essential to know the exact chemical composition of sewage sludge to determine its value for agriculture.

Phosphorus, potassium, nitrogen and calcium must be precisely measured and maximum values established, especially when these elements exist in the form of assimilable salts.

The effectiveness or toxicity of these substances depend on the water content of sewage sludge, since soluble salts are most readily assimilated by vegetation.

6. The precise physical composition of sewage sludge must also be known since, once more, the water-content determines the effectiveness or toxicity of the sludge.

7. All kinds of sludge must be taken into consideration since under no circumstances can the size of treatment stations be seen as a criterion for their effectiveness. A small treatment plant is thus not necessarily safer than a large plant. The Committee rejects, therefore, Article 2 of the proposed directive.

8. All components of sewage sludge must be taken into consideration and not just the trace elements listed in Table II of the Commission's explanatory memorandum.

9. The notion of acceptable values is always dangerous,

- (a) because over a long period of time substances can build up in such a way they exceed the acceptable values,
- (b) because in biology the notion of acceptable values varies as knowledge of this field increases.

A good example of this is the way in which our knowledge of the effects of X-rays has developed : we now know that they are Gamma rays of ionising radiation.

10. The main problem is the presence of parasitic or organic bacteria in sludge of this kind. Naturally, means can be envisaged of destroying these bacteria and the following are widely used : pasteurization, thermoconditioning (but, of course, with limited effect if incineration is to be avoided) aerobic or anaerobic digestion, various kinds of chemical treatment, which, however, add sterilizing or dangerous elements and thus reduce the value of nutrient biological substances. Lagooning has given promising results but it is not completely effective and above all is affected by shifts in population.

11. None of the present forms of treatment provide an absolute guarantee for the elimination of pathogenic substances.

12. No solution has yet been found to the problem of heavy metals, of pesticides and of PCBs (polychlorinated biphenyls) which are extremely toxic.

#### CONDITIONS UNDER WHICH SLUDGE MAY BE USED AS A FERTILIZER

13. Under no circumstances should sludge be used in market gardening. Carrots, radishes and turnips directly absorb substances in the soil and other crops such as spinach do so through their leaves; there is a risk that, even with crops such as beet, the substances contained in them may find their way into livestock products.

14. In the same way under no circumstances should sludge be used for plant products which, after various kinds of treatment, enter into the foodchain (in the form of pellets, flour, etc.).

15. Sludge could be used in spheres which do not lead directly to human or animal food:

- horticulture,
- forestry,
- the reconstitution of forest soil after fires.

16. Nevertheless, it is possible to envisage the use of sludge in fruit-growing, in the case of vines and fruit-trees - which act as a kind of filter - providing all the purification procedures are respected.

OPINION OF THE COMMITTEE ON AGRICULTURE

Draftsman : Mr MERTENS

On 19 October 1982 the Committee on Agriculture appointed Mr Mertens draftsman of the opinion.

It considered the draft opinion at its meetings of 2 December 1982 and 16 February 1983 and adopted its conclusions nem. con. with one abstention on 16 February 1983.

The following took part in the vote: Mr Curry, chairman; Mr Mertens, draftsman; Mr Adamou, Mr Barbagli (deputizing for Mr Diana); Mr Blaney, Mr Clinton, Mr Costanzo (deputizing for Mr Colleselli); Mr Cronin (deputizing for Mr Mouchel); Mr Dalsass, Mr Davern, Mrs Desouches, Mr Gatto, Mr Gautier, Mr Helms, Mr Tolman, Mr Vernimmen and Mr Woltjer.

## I. INTRODUCTION

1. The Commission proposal under consideration here seeks to lay down Community rules on the use of sewage sludge in agriculture. The environmental aspects of this problem will be thoroughly discussed by the committee responsible, so your draftsman can confine himself to the agricultural aspects.
2. A limited study of the literature has shown that the properties of sludge which are mostly mentioned as positive properties of sludge in relation to crops are organic matter and macronutrient content and those most often mentioned as negative from the point of view of plants, animals and human beings are the pathogens, pesticides and heavy metals present.

The Commission proposal is confined to use of sludge from sewage treatment plants treating urban, or similar effluents and mixed urban and industrial or trade effluents.

3. In different countries part of the total sludge produced is already used in agriculture: 25% in Belgium, 20% in France, 15% in the Netherlands and 20% in Scotland.

Sludge not disposed of in agriculture is dumped on landfill sites, incinerated or dumped at sea.

4. Assessment of the agricultural value of sludge is mainly based on a chemical analysis. On the one hand, knowledge of the N, P, K, Ca and Mg content, the moisture content, the C/N ratio, the quantity of organic matter and the pH is essential in judging the value of these substances as manure and is decisive for the dosage. On the other hand, the content of trace elements, especially heavy metals, can limit its usefulness as a fertilizer.

## II. DISCUSSION OF THE PROPOSAL

5. The Commission proposes that sewage works serving a population of less than 5,000 be excluded from this directive. Your draftsman feels that this is very dangerous, particularly as the Commission, in its explanatory memorandum, itself points out that there is 'little' risk of infection.

Current experience with the use of sludge from small sewage works shows that the sludge is largely used in the immediate neighbourhood. This means that notwithstanding the slight risk of an excessive concentration of specific heavy metals occurring, the risk of accumulation by spreading in consecutive years cannot be ruled out.

Your draftsman does not want to go into this in too much detail, but wishes nevertheless to remark that excessive concentrations of certain metals in soluble form can be absorbed by plants and may lead via the food chain to contamination of human beings. Unlike other contaminants, such as organic compounds, these substances do not disappear from the environment. They can at the most be transported or made soluble by soil bacteria and moulds. The absorption by human beings or animals of excessive quantities of heavy metals leads to serious sickness.

It is therefore proposed that no exceptions be made and that all sludge used in agriculture be subjected to the controls proposed in the proposal for a directive.

6. Article 3 of the proposal for a directive lays down 'mandatory values' for five trace elements. For the same five trace elements and for three others 'recommended values' are laid down which must, if possible, be taken into account.

From the literature on this subject, as can be seen in Table II of the Commission's explanatory memorandum, it emerges that the situation is rather different in the Member States and in other European countries.

The list of trace elements for which limits are fixed is not the same in all countries and, in addition, the limits themselves diverge somewhat.

Without casting doubt on the opinion of the experts who collaborated with the Commission, your rapporteur is nevertheless of the opinion that caution is called for and that it is better to add some trace elements to the list and to lay down mandatory values for all elements. Along with these mandatory values, recommended values can then also be set for all trace elements.

In concrete terms, it is proposed that all the trace elements that the Commission mentions in the annexes be included on the list and that cobalt, manganese and selenium be added.

In the literature, adequate information on research results is available to make it possible for mandatory values to be set for these elements, account being taken of certain factors specific to European agriculture.

7. Article 7 of the proposal stipulates that sludge must be stabilized before it is used in agriculture, unless it is immediately injected or worked into the soil. The stabilization is necessary to kill the pathogens in the sludge.

Unlike heavy metals, it is thus quite possible to remove these organisms from the sludge before it is spread on the land.

In practice there are a large number of ways of stabilizing sludge: anaerobic digestion, aerobic digestion, disinfection by liming, the use of chemicals, pasteurization, heat treatment, the use of biological agents, lagooning or ordinary storage, etc. No single one of these methods seems, however, to give a satisfactory result by itself, so that more often than not a combination of these methods will be necessary, depending on the pathogens present in the original sludge.

There remains nevertheless a real danger of infection and this applies not only to organisms which are dangerous to man but also to plant pathogens such as potato cyst eel-worm, tomato mosaic virus and cucumber mosaic virus.

The time-limit of six weeks between the spreading of sludge and grazing or harvest will, in most cases, be enough to kill the remaining germs.

The survival time, however, depends on temperature, rainfall, type of crop, type of soil and the presence of hostile organisms and therefore varies from place to place and according to the micro-climate at the time.

It has been established that enteroviruses survive 36 days on radish and that coliform micro-organisms are only killed by 50 hours of sunlight on reed fescue.

It may be inferred from this that a time-limit of 6 weeks is an absolute minimum and that it should be extended to 2 months.

8. In the Commission proposal no indications are given about the presence of pesticide residues and of PCBs (polychlorobiphenyl derivatives) in the sludge. Obviously there has been little research on concentrations of these substances in sludge. The WHO (World Health Organization) alone has set a limit for the maximum concentration of PCBs in sludge, namely 10 ppm for dry matter.

Analyses of certain samples in the USA and Canada have shown that this concentration is sometimes clearly exceeded.

Often pesticides together display very specific interactions which strengthen or weaken the effect in the substratum.

Research has also shown that root crops have the property of absorbing considerable quantities of organochloride compounds. Danger might arise if these are later mixed with fodder.

As a satisfactory solution has apparently so far nowhere been found to the problem of pesticides and PCBs and, as certain dangers have been recognized, the Commission is urgently requested to take all necessary measures to keep abreast of trends in research and at the same time to ensure that no danger arises for plants, animals and human beings from the use of sludge in agriculture.

9. Article 9 provides that the spreading of sludge should be accomplished in such a way that the needs of the plants are met and that the quality of the soil, surface and groundwater remains unaffected.

Sewage sludge is, in general, rich in N, P and Mg (nitrogen, phosphorus and magnesium). The potassium content, on the other hand, is on the low side, so that in many cases supplementary application of potassium is necessary. The average C/N ratio is around 10. A C/N value of more than 30 makes additional application of nitrogen necessary for satisfactory humification.

The question may be asked whether a user of sludge will be able to decide himself whether extra application is necessary.

Your draftsman proposes that sludge producers be compelled, on the basis of sludge analysis, to determine which elements must be added in what quantities to achieve a judicious and balanced dressing, account being taken of the condition of the land to be treated.

### III. CONCLUSION

10. It can be stated that the nutrient content in sludge may be of a nature to bring about an increase in the productivity of the land treated.

Likewise, the use of sludge can help to improve the soil structure, as it has a high calcium and organic matter content.

Nevertheless a number of precautions should be taken, as sludge contains not only useful but also superfluous and even dangerous substances.

To reduce the dangers caused by these substances, the Committee on Agriculture requests the committee responsible to include the following considerations in its report:

1. The exception made for small sewage works, as laid down in Article 2 of the Commission proposal should be removed;
2. Mandatory values should be set for Cd, Cu, Ni, Pb, Zn, Cr, Hg, Co, Mn and Se in Annexes IA, IB and IC, and these should not exceed the values laid down in individual Community directives (e.g. on cadmium) and certain national regulations.

3. Annex IB should contain rules fixing reasonable limits for the permissible amounts of sewage sludge applied annually.

The absolute permissible amounts in kg/hectare per year for application of heavy metals must be brought into line with existing regulations, i.e. be set at lower levels. This applies particularly to cadmium, copper, zinc, lead and nickel.

4. The ~~time~~-limit of 6 weeks laid down in Article 8, paragraph 2, should be increased to 2 months;
5. An obligation should be included on sludge producers to indicate with each delivery of sludge the supplements which are needed.

