



COMMISSION OF THE EUROPEAN COMMUNITIES

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2005/0058 (CNS)

Proposal for a

COUNCIL DIRECTIVE

on the control of potato cyst nematodes

(presented by the Commission)

EXPLANATORY MEMORANDUM

1. CONTEXT OF THE PROPOSAL

- Grounds for and objectives of the proposal

Revision and updating of Council Directive 69/465/EEC of 8 December 1969 on control of Potato Cyst Eelworm.
- General context

General measures to be taken within the Member States against potato cyst nematodes in order to determine their distribution, to prevent their spread and to control them.
- Existing provisions in the area of the proposal

Revision of current EU-legislation which has been found insufficient and not up to date.
- Consistency with other policies

In line with other current directives on the control of harmful organisms of potatoes.

2. CONSULTATION OF INTERESTED PARTIES AND IMPACT ASSESSMENT

- Consultation of interested parties

Consultation methods, main sectors targeted and general profile of respondents.

Four meetings of informal consultation with national experts of relevant Member States.

Exchange of information and comments by e-mail between EC and the national experts of the Member States.

A meeting with representatives of European Seed Association (ESA).

A meeting with representatives of the Committee of Agricultural Organisations in the European Union (COPA) and the General Confederation of Agricultural Co-operatives in the European Union (COCEGA).

The main organisations mentioned above (ESA/COPA/COGECA) did not raise any substantive issues over the proposed text. They questioned the likely cost of the measures for producers and the Commission explained that this would not vary substantially from the measures already in force.

Summary of responses and how they have been taken into account.

National experts were consulted on the whole of the draft text and particularly on the harmonised sampling and testing procedures. Their responses have been taken into account where appropriate.

- Collection and use of expertise

Scientific/expertise domains concerned.

Nematologists and plant health experts.

Methodology used.

Written and oral consultations.

Main organisations/experts consulted.

National experts from the competent authorities of relevant Member States. Independent scientific advice from the scientific panel on plant health of the European Food Safety Authority was not sought because the Authority is not currently in a position to respond to matters in the plant health field.

Level of scientific certainty: high.

Advice received and used.

The experts advised on updated and harmonised sampling and testing procedures.

Means used to make the expert advice publicly available.

None but legislation reflecting the expertise will be made public.

- Impact assessment

In general, the impact is considered relatively neutral because the proposed Directive is replacing existing legislation on the control of potato cyst nematodes. On one hand, there is no longer the obligation to eradicate potato cyst nematodes but to determine their distribution and prevent their spread and to control them.

On the other hand the testing for potato cyst nematodes before planting certain plants intended for the production of plants for planting is a new aspect that is introduced. This is required because of the high risk of spreading potato cyst nematodes by contaminated plants for planting through the associated soil. Therefore certain plants grown in rotation with potatoes will be subject to control measures.

3. LEGAL ELEMENTS OF THE PROPOSAL

- Summary of the proposed action

General measures to be taken by the Member States against potato cyst nematodes such as:

- official investigations to ensure that no potato cyst nematodes are present in fields in which seed potatoes intended for the production of seed potatoes, and certain plants, intended for the production of plants for planting, are held or planted;
- official surveys to be carried out annually in fields used for the production of potatoes other than those used for the production of seed potatoes;
- control measures if potato cyst nematodes are found;
- decontamination measures;
- notifications by the Member States to the EC.

- Legal basis

Article 37 of the Treaty establishing the European Community

- Subsidiarity principle

The subsidiarity principle applies insofar as the proposal does not fall under the exclusive competence of the Community.

The objectives of the proposal cannot be sufficiently achieved by the Member States for the following reason(s).

If potato cyst nematodes were not controlled simultaneously and methodically throughout the whole of the Community, protective measures to prevent the introduction of such harmful organisms into the territory of a Member State would only have limited effect.

Community action will better achieve the objectives of the proposal for the following reason(s).

Potato production occupies an important place in Community agriculture and potato yields are constantly threatened by harmful organisms. If such organisms were not controlled simultaneously and methodically throughout the Community, protective measures to prevent the introduction of such harmful organisms into the territory of a Member State would only have limited effect. In order to ensure this, general measures to be taken by the Member States against potato cyst nematodes are necessary. Member States can take additional or stricter measures where necessary provided that there is no hindrance to the movement of potatoes within the Community.

The proposal therefore complies with the subsidiarity principle.

- Proportionality principle

The proposal complies with the proportionality principle for the following reason(s).

The proposed Directive contains general measures to be carried out by the Member States.

Nevertheless, the proposed Directive leaves scope for national decisions within a given framework on the definition of "field", "area of production", "probability of the presence of potato cyst nematodes", the content of an official control programme.

Not applicable; revision of current EU-legislation.

- Choice of instruments

Proposed instruments: directive.

Other means would not be adequate for the following reason(s).

The proposed text contains general measures to ensure the control and to prevent the spread of potato cyst nematodes in the Community requiring the national plant protection organisations to establish national procedures to implement the text, hence the use of the Directive.

Other means than a Directive would not be adequate in this case

4. BUDGET IMPLICATIONS

No implication for the budget.

5. ADDITIONAL INFORMATION

- Repeal of existing legislation

The adoption of the proposal will lead to the repeal of existing legislation.

- Correlation table

The Member States are required to communicate to the Commission the text of national provisions transposing the proposed Directive as well as a correlation table between those provisions and this Directive.

Proposal for a

COUNCIL DIRECTIVE

on the control of potato cyst nematodes

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 37 thereof,

Having regard to the proposal from the Commission¹,

Having regard to the opinion of the European Parliament²,

Whereas:

- (1) Since the adoption of Council Directive 69/465/EEC of 8 December 1969 on control of Potato Cyst Eelworm³ there have been significant developments in the nomenclature, biology and epidemiology of potato cyst nematode species and populations and their distribution pattern.
- (2) Potato cyst nematodes (*Globodera pallida* (Stone) Behrens (European populations) and *Globodera rostochiensis* (Wollenweber) Behrens (European populations)) are recognised as harmful organisms of potatoes.
- (3) The provisions of Directive 69/465/EEC have been re-examined and, as a result of this re-examination, have been found insufficient. Therefore the adoption of more comprehensive provisions is necessary.
- (4) The provisions should take into account that official investigations are necessary to ensure that no potato cyst nematodes are found in fields in which seed potatoes intended for the production of seed potatoes, and certain plants intended for the production of plants for planting, are held or planted.
- (5) Official surveys should be carried out annually on fields used for the production of potatoes other than those used for the production of seed potatoes.
- (6) Sampling and testing procedures should be set out for conducting such official investigations and surveys.

¹ OJ C

² OJ C

³ OJ L 323, 24.12.1969, p. 3.

- (7) Account should be taken of the means of spread of the pathogen.
- (8) The provisions should take into account that the control of potato cyst nematodes is traditionally by crop rotation as it is recognized that several years in the absence of potato cultivation will reduce the population of nematodes by a significant degree. More recently crop rotation has been supplemented by the use of resistant potato varieties.
- (9) Furthermore, Member States should be able to take additional or stricter measures where necessary, provided that there is no hindrance to the movement of potatoes within the Community, except insofar as laid down in Council Directive 2000/29/EC of 8 May 2000 on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community⁴. Such measures should be notified to the Commission and to the other Member States.
- (10) Directive 69/465/EEC should therefore be repealed.
- (11) Since the objectives of the action to be taken, namely to determine the distribution of potato cyst nematodes, to prevent their spread and to control them, cannot be sufficiently achieved by the Member States and can therefore by reason of the scale and effects of the action be better achieved at Community level, the Community may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty. In accordance with the principle of proportionality, as set out in that Article, this Directive does not go beyond what is necessary in order to achieve those objectives.
- (12) The measures necessary for the implementation of this Directive should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission⁵,

HAS ADOPTED THIS DIRECTIVE:

Chapter I

Subject-matter and definitions

Article 1

This Directive establishes the measures to be taken by the Member States against *Globodera pallida* (Stone) Behrens (European populations) and *Globodera rostochiensis* (Wollenweber) Behrens (European populations), hereinafter referred to as “potato cyst nematodes”, in order to determine their distribution, to prevent their spread and to control them.

⁴ OJ L 169, 10.7.2000, p. 1. Directive as last amended by Commission Directive 2005/16/EC (OJ L 57, 3.3.2005, p. 19).

⁵ OJ L 184, 17.7.1999, p. 23.

Article 2

For the purpose of this Directive the following definitions shall apply:

- (a) *official* or *officially* means established, authorised or performed by the responsible official bodies of a Member State as defined in Article 2(1)(g) of Directive 2000/29/EC;
- (b) *resistant potato variety* means a variety that when grown significantly inhibits the development of a particular population of potato cyst nematodes;
- (c) *investigation* means a methodical procedure to determine the presence of potato cyst nematodes in a field;
- (d) *survey* means a methodical procedure conducted over a defined period of time to determine the presence of potato cyst nematodes in the territory of a Member State.

Article 3

1. The responsible official bodies of the Member State shall define what constitutes a field for the purposes of this Directive in order to ensure that phytosanitary conditions within a field are homogenous as regards the risk of potato cyst nematodes. In doing so, they shall take into account sound scientific and statistical principles, the biology of the potato cyst nematode and the particular production systems of the host plants of potato cyst nematodes in that Member State. The detailed criteria for the definition of a field shall be officially notified to the Commission and to the other Member States.
2. Further provisions related to the criteria for the definition of a field may be adopted in accordance with the procedure referred to in Article 17(2).

Chapter II

Detection

Article 4

1. Member States shall prescribe that an official investigation for the presence of potato cyst nematodes shall be carried out on the field in which the plants listed in Annex I, intended for the production of plants for planting, or seed potatoes intended for the production of seed potatoes, are to be held or grown.
2. The official investigation provided for in paragraph 1 shall be carried out either immediately prior to planting or earlier, in which case documentary evidence of the results of that investigation shall be available confirming that potatoes and other host plants listed in point 1 of Annex I were not present at the time of the investigation and have not been grown since the investigation.

3. Results of official investigations other than those referred to in paragraph 1 and carried out before 1 January 2007 may be considered as evidence as referred to in paragraph 2.
4. If the responsible official bodies of a Member State have established that there is no risk of spreading potato cyst nematodes, the official investigation referred to in paragraph 1 shall not be required for:
 - (a) the planting of plants listed in Annex I, intended for the production of plants for planting for non-commercial use within a single place of production situated in an officially defined area,
 - (b) the planting of seed potatoes, intended for the production of farm saved seed within a single place of production situated in an officially defined area.
5. Member States shall ensure that the results of the investigations referred to in paragraphs 1 and 3 are held in an official register and are accessible to the Commission.

Article 5

1. In the case of seed potatoes intended for the production of seed potatoes and of the plants listed in point 1 of Annex I, intended for the production of plants for planting, the official investigation referred to in Article 4(1) shall involve sampling and testing for the presence of potato cyst nematodes in accordance with Annex II.
2. In the case of the plants listed in point 2 of Annex I, intended for the production of plants for planting, the official investigation referred to in Article 4(1) shall involve sampling and testing for the presence of potato cyst nematodes in accordance with Annex II or verification as set out in Section I of Annex III.

Article 6

1. Member States shall provide that official surveys are carried out annually for the presence of potato cyst nematodes on fields used for the production of potatoes, other than those intended for the production of seed potatoes.
2. The official surveys shall involve sampling and testing for the presence of potato cyst nematodes in accordance with point 2 of Annex II and shall be carried out in accordance with Section II of Annex III.
3. The results of the official surveys shall be notified in writing each year to the Commission by 31 December at the latest.

Article 7

If, as a result of the official investigation referred to in Article 4(1) and the other official investigations referred to in Article 4(3) no potato cyst nematodes are found, the responsible official bodies of a Member State shall ensure that a document is issued stating that the field has been investigated and no potato cyst nematodes have been found.

Article 8

1. When potato cyst nematodes are found in the official investigation referred to in Article 4(1) the responsible official bodies of a Member State shall ensure that a document is issued stating that the field has been investigated and potato cyst nematodes have been found. Details of fields found infested with potato cyst nematodes during the official investigation shall be entered into the official register referred to in Article 4(5).
2. When potato cyst nematodes are found in a field during the official annual survey referred to in Article 6(1), the responsible official bodies of a Member State shall ensure that a document is issued stating that the field has been surveyed and potato cyst nematodes have been found. Details of fields found infested with potato cyst nematodes during the annual survey shall be entered into the official register referred to in Article 4(5).
3. Potatoes or plants listed in Annex I which come from a field for which a document as referred to in paragraph 1 or paragraph 2 has been issued, or have been in contact with soil in which potato cyst nematodes have been found shall be officially designated as contaminated.

Chapter III

Control Measures

Article 9

1. Member States shall prescribe that in a field for which a document as referred to in Article 8(1) or 8(2) has been issued:
 - (a) no potatoes intended for the production of seed potatoes, including farm saved seed, shall be planted, and
 - (b) no plants listed in Annex I, intended for replanting, shall be planted or stored. However, plants listed in point 2 of Annex I may be planted in that field provided that these plants are to be subject to the officially approved measures referred to in section III(A) of Annex III, such that there is no identifiable risk of spreading potato cyst nematodes.

2. In the case of fields to be used for planting potatoes, other than those intended for the production of seed potatoes, for which a document has been issued as referred to in Article 8(1) or 8(2), the responsible official body of the Member States shall prescribe that these fields shall be subject to an official control programme aiming at the suppression of potato cyst nematodes.

Taking account of the particular production and marketing system for host plants of potato cyst nematodes in the relevant Member State and the characteristics of the population of potato cyst nematodes present, this programme shall include the use of resistant potato varieties of the highest levels of resistance available as specified in Section I of Annex IV. This programme shall be notified in writing to the Commission and to the other Member States with a view to ensuring comparable levels of assurance between the Member States.

The degree of resistance of potato varieties shall be quantified according to the standard scoring notation table set out in Section I of Annex IV. Testing for resistance shall be carried out according to the protocol set out in Section II of Annex IV.

Article 10

1. Member States shall prescribe that for potatoes or plants listed in Annex I, which have been designated as contaminated under Article 8(3)
 - (a) in the case of seed potatoes, including farm saved seed potatoes, they shall not be planted unless they have been decontaminated under the supervision of the responsible official bodies of a Member State using an appropriate method adopted under paragraph 2, based on scientific evidence that there is no risk of spreading potato cyst nematodes,
 - (b) in the case of potatoes intended for industrial processing or grading, they shall be subject to officially approved measures in accordance with Section III(B) of Annex III,
 - (c) in the case of plants listed in Annex I, they shall not be planted unless they have been subject to the officially approved measures as referred to in Section III(A) of Annex III, such that they are no longer contaminated.
2. Specifications of the methods referred to in paragraph 1(a) shall be adopted in accordance with the procedure referred to in Article 17(2).

Article 11

1. Without prejudice to Article 16(1) of Directive 2000/29/EC, Member States shall ensure that the suspected occurrence or confirmed presence of potato cyst nematodes in their territory resulting from a breakdown or change in the effectiveness of a resistant potato variety which relates to an exceptional change in the composition of a nematode species, pathotype or virulence group, shall be reported to their own responsible official bodies.

2. For all cases reported under paragraph 1, Member States shall provide that the potato cyst nematode species and, where applicable, the pathotype or virulence group involved, are investigated and confirmed by appropriate methods.
3. The details of the confirmations referred to in paragraph 2 shall be sent in writing each year by 31 December at the latest to the Commission and to the other Member States.
4. The appropriate methods referred to in paragraph 2 may be adopted in accordance with the procedure referred to in Article 17(2).

Article 12

Member States shall notify in writing to the Commission and to the other Member States each year by 31 December at the latest, a list of all the varieties of potatoes accepted by them for marketing in the following year and which they have found by official investigation to be resistant to potato cyst nematodes. They shall state the pathotypes or virulence groups to which the varieties are resistant, the degree of resistance and the year of its determination against the pathotype or virulence group.

Article 13

If, after the officially approved measures referred to in Section III(C) of Annex III have been taken, the presence of potato cyst nematodes is not confirmed, the responsible official bodies of the Member State shall ensure that the official register referred to in Article 4(5) is updated and any restrictions imposed on the field are revoked.

Article 14

Without prejudice to Articles 3 and 5 of Directive 2000/29/EC, Member States may authorise derogations from the measures referred to in Articles 9 and 10 of this Directive in accordance with the provisions laid down in Commission Directive 95/44/EC⁶ for trial or scientific purposes and for work on varietal selections.

Chapter IV

General and final provisions

Article 15

Member States may adopt in relation to their own production such additional or stricter measures as may be required to control potato cyst nematodes or to prevent them spreading in so far as they are in compliance with Directive 2000/29/EC.

⁶ OJ L 184, 3.8.1995, p. 34.

Those measures shall be notified in writing to the Commission and to the other Member States.

Article 16

Amendments to the Annexes, to be made in the light of developments in scientific or technical knowledge, shall be adopted in accordance with the procedure referred to in Article 17(2).

Article 17

1. The Commission shall be assisted by the Standing Committee on Plant Health, hereinafter referred to as “the Committee”.
2. Where reference is made to this paragraph, Articles 5 and 7 of Decision 1999/468/EC shall apply.

The period laid down in Article 5(6) of Decision 1999/468/EC shall be set at three months.

3. The Committee shall adopt its Rules of Procedure.

Article 18

1. Member States shall adopt and publish by 31 December 2006 at the latest the laws, regulations and administrative provisions necessary to comply with this Directive. They shall forthwith communicate to the Commission the text of those provisions and a correlation table between those provisions and this Directive.

They shall apply those provisions from 1 January 2007.

When Member States adopt those provisions, they shall contain a reference to this Directive or be accompanied by such a reference on the occasion of their official publication. Member States shall determine how such reference is to be made.

2. Member States shall communicate to the Commission the text of the main provisions of national law, which they adopt in the field governed by this Directive.

Article 19

Directive 69/465/EEC is repealed with effect from 1 January 2007.

Article 20

This Directive shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Directive is addressed to the Member States.

Done at Brussels,

*For the Council
The President*

ANNEX I

List of plants referred to in Articles 4(1), 4(2), 4(4), 5(1), 5(2), 8(3), 9(1)(b), and 10(1)

1. Host plants with roots:

Capsicum spp.,

Lycopersicon lycopersicum (L.) Karsten ex Farw.,

Solanum melongena L.

2. (a) Other plants with roots:

Allium porrum L.,

Beta vulgaris L.,

Brassica spp.,

Fragaria L..

2. (b) Bulbs, grown in soil and intended for planting, other than those for which there shall be evidence by their packaging or by other means that they are intended for sale to final consumers not involved in professional plant or cut flower production, of:

Allium ascalonicum L.,

Allium cepa L.,

Dahlia spp.,

Gladiolus Tourn. Ex L.,

Hyacinthus spp.,

Iris spp.,

Lilium spp.,

Narcissus L.,

Tulipa L..

ANNEX II

1. With reference to the sampling and testing for the official investigation referred to in Article 5(1) and 5(2):
 - (a) sampling shall involve a soil sample with a standard size of at least 1500 ml soil/ha collected from at least 100 cores/ha preferably in a rectangular grid of not less than 5 meters in width and not more than 20 meters in length between sampling points covering the entire field. The whole sample shall be used for further examination, i.e. extraction of cysts, species identification and, if applicable, pathotype/virulence group determination;
 - (b) testing shall involve methods for the extraction of potato cyst nematodes described in Appendix 1 of the 'Phytosanitary procedures for *Globodera pallida* and *Globodera rostochiensis*: Soil sampling methods' (PM 3/30 (1), EPPO standards), or the bioassay method.

2. With reference to the sampling and testing for the official survey referred to in Article 6(2):
 - (a) sampling shall be:
 - the sampling described in point 1 with a minimum sample size of soil of at least 400 ml/ha;
 - or
 - targeted sampling of at least 400 ml of soil after visual examination of roots where there are visual symptoms;
 - or
 - sampling of at least 400 ml of soil associated with the potatoes after harvesting provided that the field where the potatoes were grown is traceable;
 - (b) testing shall be the testing referred to in point 1.

3. By way of derogation the sample size referred to in point 1 may be reduced to a minimum of 400 ml of soil/ha provided that:
 - (a) there is documentary evidence that no potatoes or other host plants listed in point 1 of Annex I have been grown and were present in the field in the six years prior to the official investigation;
 - or
 - (b) no potato cyst nematodes have been found during the last two successive official investigations in samples of 1500 ml soil/ha and no potatoes or other host plants listed in point 1 of Annex I have been grown and were present after the first of these two official investigations;

or

- (c) no cysts of potato cyst nematodes (with or without live content) have been found in the last official investigation which must have consisted of a sample size of at least 1500 ml soil/ha and no potatoes or other host plants listed in point 1 of Annex I, have been grown and were present in the field since the last official investigation.

Results of other official investigations carried out before the entering into force of this Directive may be considered as official investigations as referred to in subparagraph b and c.

The use of the reduced sample size may be continued in the subsequent official investigations referred to in Article 4(1) until potato cyst nematodes have been found in the field concerned.

ANNEX III

Section I

Verification

With reference to Article 5(2), the official investigation referred to in Article 4(1) shall establish that at the time of verification one of the following criteria are met:

- no history of potato cyst nematodes in the field during the last 12 years, based on the results of appropriate officially approved testing

or

- a known cropping history in which no potatoes or other hosts plants listed in point 1 of Annex I have been grown in the field in the past 12 years.

Section II

Surveys

The official surveys referred to in Article 6(1), shall be conducted on at least 0.5% of the area of production of potatoes, other than that intended for the production of seed potatoes.

Section III

Official Measures

- (A)** The officially approved measures referred to in Article 9(1)(b) and in Article 10(1)(c) are:
 1. disinfestation by appropriate methods such that there is no identifiable risk of the potato cyst nematodes spreading
 2. removal of soil by washing or brushing until practically free of soil such that there is no identifiable risk of the potato cyst nematodes spreading.
- (B)** The officially approved measures referred to in Article 10(1)(b) are direct and immediate delivery to a processing or grading plant with appropriate and officially approved waste disposal facilities for which it has been established that there is no risk of the potato cyst nematodes spreading.
- (C)** The officially approved measures referred to in Article 13 are an official re-sampling of the field for which a document as referred to in Article 8(1) or 8(2) has been issued, and testing using one of the methods specified in Annex II, after a minimum period of 6 years counting from the positive confirmation of potato cyst nematodes, or counting from the growing of the last potato crop. This period may be reduced to a minimum of 3 years if appropriate officially approved measures have been taken.

ANNEX IV

SECTION I

DEGREE OF RESISTANCE

The degree of susceptibility of potatoes to potato cyst nematodes shall be quantified according to the following standard scoring notation as referred to in point (b) of Article 2.

The score 9 indicates the highest level of resistance.

Relative susceptibility (%)	Score
< 1	9
1.1 – 3	8
3.1 – 5	7
5.1 – 10	6
10.1 – 15	5
15.1 – 25	4
25.1 – 50	3
50.1 – 100	2
> 100	1

SECTION II

PROTOCOL FOR RESISTANCE TESTING

1. The test shall be performed in a quarantine facility either outside, in glasshouses, or in climate chambers.
2. The test shall be performed in pots each containing at least one litre of soil (or suitable substrate).
3. The soil temperature during the course of the test shall not exceed 25°C and adequate watering shall be provided.
4. When planting the test or control variety one potato eye plug of each test or control variety shall be used. Removal of all stems except one is recommended.
5. The potato variety 'Desirée' shall be used as a standard susceptible control variety in every test. Additional fully susceptible control varieties of local relevance may be added as internal checks. The standard susceptible control variety may be changed if research indicates that other varieties are either more suitable or more accessible.
6. The following standard populations of potato cyst nematodes shall be used against pathotypes Ro1, Ro5, Pa1 and Pa3:

Ro1: population Ecosse

Ro5: population Harmerz

Pa1: population Scottish

Pa3: population Chavornay

Other potato cyst nematode populations of local relevance may be added.
7. The identity of the standard population used shall be checked using appropriate methods. It is recommended that at least two resistant varieties or two differential standard clones of known resistance capacity are used in the test experiments.
8. The potato cyst nematode inoculum (Pi) shall consist in total of 5 infective eggs and juveniles per ml of soil. It is recommended that the number of potato cyst nematodes to be inoculated per ml of soil is determined in hatching experiments. The potato cyst nematodes may be inoculated as cysts, or combined as eggs and juveniles in a suspension.
9. The viability of the potato cyst nematode cyst content used as the inoculum source shall be at least 70%. It is recommended that the cysts are 6-24 months old and are kept for at least 4 months at 4°C immediately prior to use.

10. There shall be at least 4 replicates (pots) per combination of potato cyst nematode population and potato variety tested. It is recommended to use at least 10 replicates for the standard susceptible control variety.
11. The duration of the test shall be at least 3 months and the maturity of developing females shall be checked before breaking up the experiment.
12. Potato cyst nematode cysts from the 4 replicates shall be extracted and counted separately for each pot.
13. The final population (Pf) on the standard susceptible control variety at the end of the resistance test shall be determined by counting all cysts from all replicates and the eggs and juveniles from at least 4 replicates.
14. A multiplication rate of at least 20x (Pf/Pi) on the standard susceptible control variety shall be achieved.
15. The coefficient of variation (CV) on the standard susceptible control variety shall not exceed 35%.
16. The relative susceptibility of the tested potato variety to the standard susceptible control variety shall be determined and expressed as a percentage according to the formula:
$$Pf_{\text{test variety}} / Pf_{\text{standard susceptible control variety}} \times 100\%.$$
17. If a tested potato variety has a relative susceptibility of more than 3%, cyst counts will suffice. In cases where the relative susceptibility is less than 3%, eggs and juveniles shall be counted in addition to cyst counts.
18. Where the results of tests in the first year indicate that a variety is fully susceptible to a pathotype, there is no requirement to repeat these tests in a second year.
19. The results of the tests shall be confirmed by at least one other trial performed in another year. The arithmetic mean of the relative susceptibility in the 2 years shall be used to derive the score according to the standard scoring notation.