

Certification scheme fruit plants

Explanatory guide to raspberries and blackberries (*Rubus*)

October 2023

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1. Introduction

This document is a guide to *Rubus* certification taken from The Plant Health (Amendment etc.) (EU Exit) Regulations 2020 and The Plant Health (Phytosanitary Conditions) (Amendment) (EU Exit) Regulations 2020

2. Applications

The scheme is open to any grower in England and Wales who can meet the general conditions for entry and comply with the specific conditions of entry. Applications for entry of material to be submitted through the approved administrator, presently APHA. Please request an application form, from FPCS.admin@apha.gov.uk

Growers will need to apply to APHA and be registered to issue Plant Passports.

3. Labelling / sealing / supplier and variety registration

Refer to separate documents covering labelling, sealing, supplier and variety registration.

4. Grades and stock eligibility

Conditions for the certification of stocks propagated by softwood or root cuttings.

Eligible material

Parent material

Pre-basic: Any variety certified at Pre-basic or a candidate Pre-basic mother plant.

Basic 1: Any variety that meets Pre-basic requirements

Basic 2: Any variety certified at Pre-basic or Basic 1 the previous year

Certified: Any variety certified at Pre-basic, Basic 1, Basic 2 the previous year

Conditions for the certification of Field Grown stocks

(i) New plantings

Basic 1: Any variety certified at Pre-basic the previous year.

Any variety certified as Basic 1 cuttings, the cuttings and field grown stages count consecutively towards the 4 years maximum at this grade.

Basic 2: Any variety certified at Basic 1 the previous year.

Any variety certified as Basic 2 cuttings, the cuttings and field grown stages count consecutively towards the 4 years maximum at this grade

Certified: Any variety certified at Basic 1 or Basic 2 in the previous year.

Any variety certified as 'Certified cuttings'.

Beds have unlimited life at 'Certified' provided all scheme conditions are met

(ii) Established beds

Basic 1: Beds that have been certified as Basic 1 in the previous year. Beds are eligible for a maximum of 4 years at Basic 1

Basic 2: Beds that have been certified at Basic 1 or Basic 2 in the previous year. Beds are eligible for a maximum of 4 years at Basic 2

Certified: Beds that have been certified at Basic 1, Basic 2 or 'Certified' in the previous year. Beds have unlimited life at 'Certified' provided all scheme conditions are met.

5. Freedom from quarantine diseases

Crops must not be grown on land known to be infected with the following soil-borne diseases: Rhizomania, Strawberry red core or *Verticillium* wilt disease of hops or which is under notice for Potato Wart disease or Potato Cyst Nematode.

Growers who become aware of or suspect the presence of any quarantine disease must notify the Plant Health Inspector immediately.

6. Soil sampling requirements

Applications for soil sampling should be made through the approved administrator.

Basic 1, Basic 2

Soil sampling of the proposed field is required for freedom from the soil living virus vector nematodes prior to planting.

Longidorus attenuates, Longidorus elongatus
Longidorus macrosoma, Xiphinema diversicaudatum

Fields found to be infested cannot be used for planting unless one of the following requirements has been complied with:

- a) Field treated with an approved soil fumigant
- b) A soil bait test has been carried out for the relevant viruses. If the result is negative for virus the site can be utilised.

An alternative to soil sampling is crop rotation where no nematode host crop has been grown at the intended planting site for the last 5 years. For *Rubus* the relevant host crops are: Grapevine, *Fragaria spp.*, *Ribes spp.*, *Rubus spp.*, cherries, plums, apricot, peach, almond and Japanese plum and their rootstocks, poplar, walnut and olive trees, hops and elder/elderberry.

Certified Soil sampling is not required.

7. Isolation distance for field grown material

Stocks entered must be isolated by at least the distance shown in the following table in metres.

	Basic 1	Basic 2	Certified	Approved-Health #	CAC	Fruiting
Basic 1	4	4	100	400	400	400
Basic 2	4	4	4	400	400	400
Certified	100	4	4	400	400	400
Approved-Health #	400	400	400	4	100	100
CAC	400	400	400	100	1	100
Fruiting	400	400	400	100	100	0

8. Spacing

For field grown material bed widths must not exceed 2 metres. There must be alleyways of at least 1 metre between beds to allow inspection.

For glasshouse production separation must be sufficient to ensure varieties of the same grade do not mix. Field isolation distances apply between different grades; exceptionally approval to reduce isolation distances may be granted from PHSI requiring additional precautions and standard operating procedures.

9. Aphid proof gauze house production and isolations

Specific conditions apply to the construction of an aphid proof structure for certification. Contact PHSI for full details. All material grown in the structure must be entered for certification.

The propagator must, with consultation with PHSI, have a Standard Operating Procedure in place detailing the operation of the gauze house.

Isolation for plants outside the gauze house (metres)					
		Basic 1 Basic 2	Certified	Approved Health #	CAC / Fruiting
Plants grown inside gauze house	Pre-basic	100	100	250	250
	Basic 1	4	10	50	100
	Basic 2	4	4	50	100
	Certified	4	4	10	100

10. Control of diseases

Fungicide treatment that could mask symptoms of *Phytophthora* root rot are not to be encouraged.

11. Roguing

Limited roguing is permissible after inspection with prior approval of the APHA Plant Health Inspector provided that records are kept of the stocks rogued, the reason for roguing and the number of plants removed are made available.

12. Gapping up

Gapping up is permissible providing that the material used is eligible and prior approval from APHA Plant Health has been obtained. Growers must keep records and make them available if requested to do so.

13. Number of inspections

Pre-basic	Two inspections per year.
Basic grades	Either field grown or pot grown. Two inspections per year
Certified	One inspection per year, normally late July to early September

14. Validity of certificates

Harvested canes from certified crops, including those subsequently potted up, may be described as certified at the appropriate grade until 31 May in the year after certification.

15. Summary of pest and disease tolerances, samples and testing

Testing

Pre-basic

Each pre-basic mother plant shall be sampled and tested two years after acceptance as a pre-basic mother plant then every two years for pests in Annex II and in the case of doubts pests in Annex I

Basic and Certified

Sampling and testing in case of doubts concerning the presence of pests and diseases in Annexes I and II

Inspection

Pre-basic and Basic plant material shall be visually free from pests and diseases listed in Annex I Part A and Annex II. Freedom can be met by removal of infected plants and / or by biological, physical or chemical treatments if applicable.

Pre-basic, Basic and Certified plant material infested with pests and diseases listed in Annex I Part B shall not exceed the tolerance levels indicated. Sampling and testing will be required if in doubt to the presence of those pests and diseases. Tolerances can be met by removal of infected plants and /or by biological, physical or chemical treatments if applicable.

Annex I

Annex I Part A	Pre-basic, Basic and Certified
Fungi	
<i>Peronospora rubi</i> Downy mildew	Nil tolerance

Annex I Part B	Pre-basic	Basic 1 Basic 2	Certified
Insects			
<i>Resseliella theobaldi</i> Raspberry cane midge	0	0	0.5
Bacteria			
<i>Agrobacterium spp</i> Crown gall	0	0.1	1.0
<i>Rhodococcus fascians</i> Leafy gall	0	0.1	1.0
Viruses			
Apple mosaic virus	0	0	
Black raspberry necrosis virus	0	0	
Cucumber mosaic virus	0	0	
Raspberry leaf mottle	0	0	0.5

Raspberry leaf spot	0	0	
Raspberry vein chlorosis virus	0	0	
Rubus yellow net virus	0	0	

Annex II	Pre-basic, Basic and Certified
Fungi <i>Phytophthora spp</i> infecting <i>Rubus</i> Viruses as appropriate for the species concerned Apple mosaic virus Black raspberry necrosis virus Cucumber mosaic virus Raspberry leaf mottle Raspberry leaf spot Raspberry vein chlorosis virus Rubus yellow net virus Raspberry bushy dwarf virus Phytoplasmas Rubus stunt phytoplasma Virus like diseases Raspberry yellow spot	 <p>Nil tolerance for all grades</p>

16. Record keeping (critical points plan)

The supplier must maintain relevant information to monitor the key points in the production process of all stocks entered for certification.

These include:

Location and number of plants

Timing of their cultivations

Propagation operations

Packaging, storage and transportation operations.

The information should remain available for at least three years and made available to PHSI upon request.

17. Requirements for pre-basic material

17.1 Eligible material

Any new or established variety or candidate material of potential new varieties can be entered. The progeny of pre-basic is eligible as parent material to produce pre-basic grade cuttings or to plant field grown basic 1 grade stoolbeds.

17.2 Growing conditions

Candidate pre-basic mother plants must be kept under insect proof conditions and physically isolated from pre-basic mother plants until all tests have been successfully completed.

Pre-basic plants must have been maintained in a suitably designed insect-proof gauze house containing only *Rubus* pre-basic plants. See section 9.

Strict precautions should be taken to prevent the introduction of any pest or disease in Annexes I and II.

All mother plants must be grown singly in sterilised growing medium and in individually labelled containers.

Pre-basic material maintained and multiplied in vitro must be adequately labelled.

17.3 Pests and diseases

Each pre-basic mother plant must be tested every two years and found free from the diseases listed in section 18 using the indicator plants or test methods described.

New plants to be entered into the pre-basic stock house must have been tested and found free of all the diseases listed in section 18.

Any plants found to be infected with the diseases listed in section 18, or exhibiting suspicious symptoms, should be removed immediately.

17.4 Documentation

The Person Responsible for the production of the plants must provide documentary evidence to show that the material has been produced under the conditions described above and that all the necessary tests were carried out and no evidence of infection was found.

This evidence must be provided to the purchaser of the pre-basic material before it can be used as parent material to produce pre-basic cuttings or planted to give a basic 1 stoolbed.

17.5 Trueness to type

Pre-basic material will be subject to official inspection for trueness to type verification.

18. Required methods of testing for diseases for Pre-basic *Rubus*

Raspberry:

Disease	Test method and indicator plant
Black raspberry necrosis virus	Graft inoculation to <i>Rubus occidentalis</i>
Raspberry leaf mottle virus	Graft inoculation to <i>R.occidentalis</i> or <i>Rubus idaeus cv.</i> Malling Landmark
Raspberry leaf spot virus	Graft inoculation to <i>R.occidentalis</i> or <i>R. idaeus cv.</i> Norfolk Giant
Raspberry yellow spot	Graft inoculation to <i>R.occidentalis</i> or <i>R. idaeus cv.</i> Malling Promise
Rubus yellow net virus	Graft inoculation to <i>R.occidentalis</i> or <i>R. macraei</i>
Raspberry vein chlorosis rhabdovirus	Graft inoculation to <i>R. idaeus cv.</i> Malling Delight or Norfolk Giant
Cucumber mosaic cucumovirus	

<p>Arabis mosaic nepovirus *</p> <p>Cherry leaf roll nepovirus</p> <p>Raspberry ringspot nepovirus *</p> <p>Strawberry latent ringspot nepovirus *</p> <p>Tomato black ring nepovirus *</p> <p>Apple mosaic ilarvirus</p>	<p>Mechanical inoculation to test plants of <i>Chenopodium quinoa</i>, <i>Cucumis sativus</i> or <i>Nicotiana clevelandi</i> as applicable.</p> <p>The nepoviruses should be confirmed serologically.</p>
<p>Raspberry root rot</p> <p><i>Phytophthora fragariae</i> <i>var. rubi</i></p> <p>or other <i>Phytophthora spp</i></p>	<p>Root sampled and tested by a root tip bait test. Alternatively the plants may be derived from micropropagation or stem cuttings taken from plants shown to be free from the above viruses.</p>
<p>Raspberry bushy dwarf virus</p>	<p>ELISA</p>
<p>Rubus stunt phytoplasma</p>	<p>Graft inoculation to <i>R. idaeus</i> cv. Malling Landmark or Norfolk Giant, or PCR testing. (See reference for further details).</p>

Blackberry and Hybrid Cultivars:

Disease	Test method and indicator plant
<p>Black raspberry necrosis virus</p>	<p>Graft inoculation to <i>R. occidentalis</i></p>
<p>Rubus yellow net virus</p>	<p>Graft inoculation to <i>R. occidentalis</i> or <i>R. macraei</i></p>

Cucumber mosaic cucumovirus Arabis mosaic nepovirus * Cherry leaf roll nepovirus Raspberry ringspot nepovirus * Strawberry latent ringspot nepovirus * Tomato black ring nepovirus * Apple mosaic ilarvirus	Mechanical inoculation to test plants of <i>Chenopodium quinoa</i> , <i>Cucumis sativus</i> or <i>Nicotiana clevelandi</i> as applicable. The nepoviruses should be confirmed serologically.
Raspberry bushy dwarf virus	ELISA
Rubus stunt phytoplasma	Graft inoculation to <i>R. idaeus</i> cv. Malling Landmark or Norfolk Giant

Notes:

1. For graft inoculation tests, one indicator plant should be used for each virus being tested for. Test plants should be observed for one growing season, if done late in the season they should be continued until the following spring.

Alternative indicator plants may be acceptable depending on the country of origin of the material, APHA should be consulted in such cases.

2. For mechanical inoculation tests on herbaceous indicators, plants should be observed for up to 4 weeks. Identification of specific viruses will require serological tests applied to extracts from the herbaceous indicators.

3. * Testing for these pests is to be retained within the FPCS to maintain consistency with the previous PHPS certification scheme.

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