



# The Art of Plant Pathology

## Exhibition

**11 April 2016 until  
07 October 2016**

Monday - Friday  
9.00 - 13.00 (afternoon  
by appointment)

Wageningen UR Library



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WAGENINGEN UR  
*For quality of life*

# The Art of Plant Pathology

**Exhibition 11 April 2016 until 07 October 2016**

The exhibition is part of the 125th anniversary celebration of the '*Royal Netherlands Society of Plant Pathology*' (KNPV). The KNPV is one of the oldest and most important societies in the field of biology and agriculture in the Netherlands.

The exhibition offers a glimpse into the rich collections of books, prints, posters and drawings at the [Special collections](#) of Wageningen UR Library.

These collections are increasingly made available for public viewing in [the image database of Wageningen UR](http://wageningenur.nl/imagecollections) [<http://wageningenur.nl/imagecollections>].

The exhibition runs on weekdays from 9 am to 1 pm, and in the afternoon by appointment.

Exhibition Location: Wageningen Campus, Droevendaalsesteeg 2, Forum (Building 102), 6708 PB Wageningen.

Production: Liesbeth Missel (composition); Jan-Kees Goud & André van der Wurff (text); team Special Collections, Wageningen UR Library

Wageningen: Wageningen UR Library, 2016.

*More information and group tours:*

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**Display 1: Plant Pathology in print**

## Classical texts & herbals

Plant disease was recorded as early as 1200 B.C in Vedas (Rugveda, Athavaeda, India). Symptoms and control of disease were described in the "Vrikshayurved" by Surapal, an ancient Sanskrit text on the science of plant life. Plant diseases have been mentioned in Buddhist literature of 500 B.C. and by Aristotle in 350 B.C.

Records of plant diseases in The Bible are thought by some to be the rusts and smuts of cereals. An example is in Genesis 41: 25-30 where God reveals to Joseph seven good years where the wheat crops would flourish followed by seven years in which the wheat would be blighted.

Aristotle's pupil Theophrastus of Lesbos (372-287 B.C.), generally considered as the father of botany, theorized about diverse diseases of trees, cereal and seeds. He believed that these diseases came about through acts of the gods when the farmers had sinned.

Caius Plinius Secundus (23-79 A.D.) described in his *Historia Naturalis* plant diseases and suggested some remedies. He believed that disease originates from the plants or from the environment. During the Middle Ages in Europe, ergot fungus – wheat mildew - infected grain. This was described in several herbals like the one by Hieronymus Bock. It was not until the invention of the first microscope, by Antoni von Leeuwenhoek in 1683, that people began to understand plant diseases.

1. The **Holy Bible**, containing the Old Testament and the New : translated out of the original tongues and with the former translations diligently compared and revised  
Oxford [s.n.], 1798. – *Genesis 41:25-30: Pharaoh's two dreams, seven years of famine*  
FORUM - SPEC.COLL. - RLL0518

&

2. Brown, T.; Aanmerkingen op verscheydene planten in de H. Schrift gemeld. - [S.l.]: [s.n.], [ca. 1700]. - 35 p. - *A fig tree with leaves but no fruits*  
FORUM - SPEC.COLL. - RHH1303c.

&

3. Scheuchzer, J.J. ; Pfeffel, J.A. ; Tysens, G. ; Paludanus, L. [et al.];  
Geestelyke natuurkunde. - Amsterdam: Petrus Schenk, 1735, 1738. - 15 dl. in 9 bd. :  
FORUM - SPEC.COLL. - R334A07

\* *Scheuchzer's gigantic work, 'Physica Sacra', is the last of those elegant works which do not really contain illustrations to a text but which are, in effect, composed of splendid plates with a text to accompany them (...) Scheuchzer hit upon the idea of investigating and supporting with modern methods all places in which the Bible poses problems of natural science." The work deals with all aspects of nature and natural history.*

4. **Theophrastus** ; Bodaeus a Stapel, J. ; Gaza, T. ; Scaliger, J.C. ; Constantini, R.  
De historia plantarum libri decem, Graece et Latine. - Amstelodami: Henricum Laurentium, 1644. - 1187 p. - *Lib. IV, Cap. 16 De morbis arborum*  
FORUM - SPEC.COLL. - R341A03. P. 493

### 5. **Plinius, Cajus.**

Plinius, C. ; Ajasson de Grandsagne. - Histoire naturelle de Pline  
Paris : Panckoucke, 1829-1833. - 37 livr. – *Livre 18, chap. 44: Maladies des grains*  
FORUM - SPEC.COLL. - R380G26

### 6. **Ibn-al-Awam**, ; Clément-Mullet, J.J.

Le livre de l'agriculture d'Ibn-al-Awam : (Kitab Al-Felahah). - Paris: A. Franck, 1864-1867. - 2 dl. - *Tom.1, chap XIV: Moyens curative pour les maladies des arbres*  
FORUM - SPEC.COLL. – ZZ01329.

### 7. **Crescentius, Petrus de**

Von dem nutz der ding die in aeckeren gebuwt werde[n]

Gedruckt zu Strassburg: durch Joanne[m] Schott,... Joannis Knoblauch, und Pauli Goetz, 1518. - 169 fol. – *Cap. 17 Von Schäden der [Wein]stöck, und ir Artzney.*

FORUM - SPEC.COLL. - R334C15 // <http://edepot.wur.nl/272362>

\*: First German edition of one of the most attractive natural history books of the post incunable period. Crescenzi was born in Bologna c. 1231. He compiled his text around 1306, drawing on the Roman writers whose works form the 'Scriptores rei rusticae', Cato, Columella, Varro, and Palladius. 'The contents of Crescenzi's book provided anyone who owned land with a well-organized manual of procedure. The (book) is divided into twelve sections, each of which addressed itself to a specific agricultural topic.

#### 8. **Bock, H.**

Kreütterbuch : darin unterscheidt Nammen und würckung der Kreütter, Stauden, Hecken und Beumen sampt ihren Früchten so in teutschen Landen wachsen.... - 3e ed.

Strassburg: Johann Rihel, 1580. - [944] p. – 2. *Tl., Cap. 34: Von dem Brandt*

FORUM - SPEC.COLL. - R336B06

### Tulipomania & the tulip breaking virus (1637-1941)

This unique tulip book with 75 gouaches served as a manuscript nursery catalogue for florist P. Cos at the height of the tulipomania period (1634-1637) in the Dutch Golden Age. The sudden occurrence of striped patterns in the plain flower colours drove prices into a speculation trade that collapsed in 1637. The most expensive tulip in this tulip book, the Viceroy, was sold for f 4200,-. The salary of a craftsman being f 200,- a year.

What makes this tulip book extraordinary is that the tulip names are part of the illustration in contemporary paint, sometimes in the form of a riddle. The weight of the bulbs (in Aasen, 1 aas = 0,048 gr.), and their prices in florins (f) for which they were sold was added later on in the illustration, as was the title page. In 1941 research at Wageningen University, by E. van Slogteren and colleagues, discovered which virus caused the tulip colours to break into striped patterns.

9. Verzameling van een meenigte tulipaanen, naar het leven geteekend met hunne naamen, en swaarte der bollen, ... verkogt zijn, te Haarlem in den jaare A. 1637, door P. Cos, ...

Haarlem: [s.n.], 1637 : 75 pl.

174519 FORUM - SPEC.COLL. - R362B03 Bot.ill.; <http://edepot.wur.nl/331264>

10. Slogteren, E. van ; Bruyn Ouboter, M.P. de

Onderzoekingen over virus-ziekten in bloembolgewassen

Wageningen: Veenman, 1941. - 2 dl.

FORUM - STACKS - NN02623,45,3/,4// NN01030,63/,65 // <http://edepot.wur.nl/293637>

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Slogteren, E. van; Plantendokter. - Haarlem: Erven F. Bohn, 1956. - 38 p.

FORUM - STACKS - NN03962,15

&

Slogteren, E. van; Van Slogteren-nummer. - Wageningen: Nederlandse Planteziektenkundige Vereniging, 1958. - 143 p.

FORUM - STACKS - 1767B32 // <http://edepot.wur.nl/282004>

11. Tulpenmozaïek Tulipa-virus 1. Tulpenstengelaaltje

In: Ziekten en plagen van land - en tuinbouwgewassen

Wageningen: [Min. L&V, afd. Publikaties en Voorlichtingsmiddelen], 1953. - map met 29 pl.

FORUM - STACKS - Vs53193 // FORUM - STACKS - 1299A02

## The start of Plant Pathology

In the 19<sup>th</sup> century the debate was still going on whether plant diseases were symptoms of physiological disorders or caused by external organisms. Generally the publication of Kühn in 1858 is considered to settle this discussion in favour of the latter. It would not be until 1861 that Anton De Bary, who is considered the father of modern plant pathology, settled the discussion about the cause of the potato blight. He did what would be today a rather simple experiment, using the scientific method. Somewhat later, in 1873, T.J. Burril, an American plant pathologist performed similar experiments with bacteria. He proved that Fire Blight of apple and pear were caused by a bacterium. De Bary published a book identifying fungi as the cause of a variety of plant diseases "Untersuchungen über die Brandpilze".

### 12. Bary, H.A. de

Untersuchungen über die Brandpilze und die durch sie verursachten Krankheiten der Pflanzen : mit Rücksicht auf das Getreide und andere Nutzpflanzen  
Berlin: Müller, 1853. - VIII, 144 p  
FORUM - SPEC.COLL. - QP0088

### 13. Cooke, M.C. ; Sowerby, J.E.

Rust, smut, mildew, and mould : an introduction to the study of microscopic fungi  
London: Hardwicke, 1865. - 238 p. : 16 ged. gekl. pl.  
FORUM - SPEC.COLL. - R387F06

### 14. Hallier, E.

Phytopathologie : die Krankheiten der Culturgewächse : fuer Land- und Forstwirthe, Gaertner und Botaniker  
Leipzig: Wilhelm Engelmann, 1868. - 373 p. : 5 pl., 32 ill.  
FORUM - SPEC.COLL. - RKr.0406

### 15. Arbois de Jubainville, A. d' ; Vesque, J.

Les maladies des plantes cultivees des arbres fruitiers et forestiers produites par le sol, l'atmosphere, les parasites-vegetaux, etc. : d'apres les travaux de Tulasne, de Bary, Berkeley, Hartig, Sorauer, etc.  
Paris: Rothschild, 1878. - 328 p.

FORUM - SPEC.COLL. - CA1074 / <http://edepot.wur.nl/60872>

&

Ward, H.M.; Diseases of plants

London [etc.]: Society for Promoting Christian Knowledge [etc.], [1889]. - 196 p. : ill.

FORUM - SPEC.COLL. - RKr.0734 / <http://edepot.wur.nl/64655>

## Potato blight (1845-'47)

During the 16th century the potato was brought to Europe, not as a potential new crop, but as part of the provisions for the sailors on their long voyage home. Potatoes soon became a standard on sailing ships because it was preventing scurvy. Potatoes were thought to have arrived in Spain around 1570 and from there were distributed throughout the mainland of Europe and the British islands. It took more than a century to become a staple food all over Europe. Potatoes grew well as major diseases were not present in Europe. In the early 19<sup>th</sup> century there was a shortage of potatoes and shiploads were imported from the Americas. However not only potatoes were imported but a fungus-like organism as well.

Halfway the nineteenth century, Ireland and other European countries suffered a devastating potato famine due to late blight of potatoes. At that time, it was commonly believed that plant diseases arose spontaneously from decay, and that the fungi were caused by this spontaneously generated disease and not – as was the case - the causal agent of diseases. Heinrich Anton De Bary supplanted this theory of spontaneously generated diseases with the germ theory of disease.

16. Ahles, W.; Wandtafeln der Pflanzenkrankheiten. – Ravensburg : Ulmer, [1874]. – Bl. 3: Die Kartoffelkrankheit

17. Martius, C.G.P. von; De aardappel - epidemie der laatste jaren : op de kankerachtige en schurftachtige ziekten der aardappelen beschreven. - Utrecht: Scheltema, 1843. - 56 p.  
FORUM - SPEC.COLL. - R384C11 / <http://edepot.wur.nl/175482>

18. Kreyssig, W.A.; Die jetzt so verheerend auftretenden Kartoffelkrankheiten, die Trockenfäule und die Schorfkrankheit oder Pocken in ihrem Wesen, ihren Ursachen, und mit naturgemäbesten und praktischen Mitteln zu ihrer Verhütung dargestellt. -Braunschweig: George Westermann, 1845. - 60 p.  
FORUM - SPEC.COLL. - RC0350

&

Moleschott, J. ; Baumhauer, E.H. von

Het wezen der aardappelziekte en de middelen ter voorkoming en genezing van dezelve : voor geleerd en ongeleerd. - Utrecht: August Bötticher, 1845. - 18 p. : 1 pl.

FORUM - SPEC.COLL. - RC0334

&

Muentzer, J.; Die Krankheiten der Kartoffeln insbesondere die im Jahre 1845 pandemisch herrschende nasse Faeule. - Berlin: Verlag von August Hirschwald, 1846. - VIII, 168 p. : 1 pl.

FORUM - SPEC.COLL. - RC0352 / - RKr.1163

&

Freyer, F.W. ; Floh, J.H.; Die Ursache der Trockenfaeule der Kartoffeln sind die Insecten ...

Berlin: [s.n.], 1845. - 58 p. : afb.

FORUM - SPEC.COLL. - RKr.1066

19. Dressel, A. ; Appel, O. ; Riehm, E.

Atlas der Krankheiten der landwirtschaftliche Kulturpflanzen. - Berlin: Parey, 1924. - 2 pl.

FORUM - SPEC.COLL. - SAE\_WURO11/032 // <http://edepot.wur.nl/328547>

20. Bourke, A.; The visitation of God? : the potato and the great Irish famine. - Dublin: Lilliput, 1993. - 230 p.

FORUM - BOOKS - 226-E-1/1993-02

&

Póirtéir, C.; The great Irish famine. - Dublin: Mercier Press, cop. 1995. - 283 p.

FORUM - STACKS - 1702C06

*\*:There is no single event in Irish history that produces more emotion, speculation and controversy than the Great Famine of 1845-1851. Analyses of the famine tend toward extremes: accusations of genocide on the part of the British were countered by revisionism of the worst kind in the mid-20th century. Originally a series of lectures broadcast on Irish National Radio, this book attempts to sort out the facts from the myths and accusations by commissioning new studies from 16 experts. Contributors include medical doctors, sociologists, historians, folklorists, economists, and other historical specialists. For a study of this kind, the collective results make for a surprisingly gripping read. Readers will uncover: why there was such a singular dependency on the potato; a breakdown of the diseases that ensued; and why the social, economic and religious doctrines that prevailed at the time led to vastly inappropriate and often downright cruel relief policies. The research is meticulous and but the writing is uniformly accessible. By using contemporary journals, letters, reports and parish records, the contributors also manage to create a vivid, often harrowing, picture of the mass starvation, disease, deliberate large-scale evictions and landlords' cynical encouragement of emigration. But they also render a heartbreaking account of a human tragedy whose passion bleeds through what might initially be dismissed as just another academic study.*

21. Recent dissertations on potato blight

Enckevort, L.J.G. van; Identification of potato genes involved in Phytophthora infestans resistance by transposon mutagenesis. - [S.l.: s.n.], 2000. - 144 p.

FORUM - STACKS - NN08202,2901// <http://edepot.wur.nl/199622>

&

Huang, S.; Discovery and characterization of the major late blight resistance complex in potato : genomic structure, functional diversity, and implications. - [S.l.: s.n.], 2005. - 136 p

FORUM - STACKS - NN08200,3693// <http://edepot.wur.nl/121627>

&

Li, Y.; Multiplex SSR analysis of Phytophthora infestans in different countries and the importance for potato breeding. - [S.l.: s.n.], 2012. - 206 p : fig., graf., tab.

FORUM - STACKS - NN08202,5258 // <http://edepot.wur.nl/212088>

## Display 2: Plant Pathology in the picture

### Men in plant pathology: J.G. de Man

Johannes Govertus de Man (May 2, 1850 in Middelburg – January 9, 1930 in Middelburg), was a Dutch biologist. He was assistant curator at the Rijksmuseum van Natuurlijke Historie (for the National Natural History Museum) in Leiden, where he specialised in free-living nematodes and decapod crustaceans (e.g. crabs, shrimps and lobsters). He also wrote papers on flatworms, sipunculids and, in his dissertation only, vertebrates. De Man left his job at the museum after eleven years. For the rest of his life, de Man worked at his parents' house in Middelburg and later at a house near the shore at Yerseke in the Oosterschelde estuary, relying on his family's private income. Next to his important contribution to Crustacea taxonomy - he described 30 Crustacea genera and 523 new Crustacea species - he is worldwide known in Nematology for the introduction of 8 new families, 61 new genera and 239 new species, including animal parasites, plant parasites and free-living terrestrial and aquatic nematodes.

In the course of time the Wageningen Laboratory of Nematology has collected a number of **drawings** of De Man. A considerable number was made available on the [website](#) of the Laboratory of Nematology and in [Wageningen UR Image Collection](#). The original drawings are kept at the Plant Protection Service in Wageningen.

22. **Man, J.G. de**; Die frei in der reinen Erde und im Süßen Wasser lebenden Nematoden der niederländischen Fauna : eine systematische-faunistische Monographie

Leiden: Brill, 1884. - 206 p. : 34 pl.

FORUM - SPEC.COLL. - R378A03 / <http://edepot.wur.nl/144377>

&

Karssen, G.; Life and work of Dr. Johannes Govertus de Man (1850-1930) : a crustacea and nematoda specialist. - Leiden: Brill, 2006. - 119 p : pl.

FORUM - BOOKS - 601-H/2006-03 / - INFODESK - DISK-0885

*\*: This book describes the life and work of Dr. Johannes Govertus de Man (1850-1930), a remarkable Dutch invertebrate zoologist. J.G. de Man worked on the systematics of both the Crustacea, in particular on Decapoda (i.e. crabs, crayfish, lobsters, and shrimps), and the microscopic Nematoda or roundworms. The biographic part describes his years of childhood and youth, student days and the time he was working at the National Museum of Natural History, Leiden, the Netherlands and the period after he resigned at the museum. In appendices, his publications, described Crustacea, Nematoda and other taxa, species named after De Man and the De Man archive are presented. A selection of his drawings and a CD-ROM with his 1884 Nematoda monograph are included.*

### Education in Wageningen: J. Ritzema Bos

Jan Ritzema Bos (Groningen, 1850 - Wageningen, 1928) is considered the founder of plant pathology in the Netherlands. In 1891, Ritzema Bos, together with Hugo de Vries, and the famous flower bulb grower Jacob Krelage, founded the Dutch Phytopathological Society (now the Royal Netherlands Society of Plant Pathology, KNPV). Krelage was the first president but Ritzema Bos succeeded him in 1895.

Until his death in 1928 Ritzema Bos remained president of the KNPV. He also acted since 1895 as editor of the 'Tijdschrift over Plantenziekten' (Journal of Plant Diseases, the current European Journal of Plant Pathology [EJPP]), the journal of the society. On June 12 1895, Ritzema Bos was appointed associate professor of plant pathology at the University of Amsterdam. On November 29, 1895, he expressed his inaugural lecture: 'The pathology of plants in its significance for the practice and for the study of biological sciences'.

From 1895 to 1906 he was also director of the established Phytopathological Laboratory 'Willie Commelin Scholten'. He was succeeded as director of the laboratory by Johanna Westerdijk. In 1899 the Phytopathological Service was established (later known as the Plant Protection Service) and he became director. The primary aim was to check plant materials and successively provide declarations that plant materials from nurseries were healthy. He would remain director until 1918.

In 1906 he changed Amsterdam for Wageningen and accepted a position as a professor at the State Higher College of Agriculture, Horticulture and Forestry in Wageningen, a forerunner of today's Wageningen University. He also became the director of the Institute for Phytopathology. He took the Phytopathological Service and in fact also the Society with him to Wageningen. Ritzema Bos was appointed Knight of the Order of the Dutch Lion and Honorary Member of the Association of Economic Biologists.

23. Ritzema Bos, J.; De Amerikaansche kruisbessenmeeldauw (*Sphaerotheca mors uvae*), in Nederland opgetreden [print copy] - Tijdschrift over plantenziekten, vol. 13 (1907) no. 4, p. 132-134  
<http://link.springer.com/article/10.1007%2FBF02809968#page-1>

Amerikaansche kruisbessenmeeldauw, [ca. 1908.] / H.M. [= Harmen H. Meurs (1891-1964)] [Dutch artist]; Collectie wandplaten Entomologie en Fytopathologie, lade 13  
<http://images.wur.nl/cdm/search/searchterm/BWUR103.001.1131>

24. **Prof. dr. J. Ritzema Bos**, Den Grondlegger der Pythopathologie in Nederland gewijd, Aet. LXX [schilderij] / W. Carbin-Gips, (1920). Geschilderd t.g.v. zijn zeventig-jarige leeftijd.  
AULA – COLL. HOOGLERAARPORTRETEN – A00114

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**Ritzema Bos, J.**; De mosterdor of het sophiahaantje (*Colaspidea (Colaphus) sophiae* F.) Tijdschrift voor entomologie, dl. 23 [1880], 13 p., 1 pl. *Colaspidea (Colaphus) sophiae* F. / J.R.B. fec.  
FORUM - STACKS - VS23026

25. Plaat 9: Vijanden van mosterd, bieten en uien (mosterdor; uienvlieg; bietenkevertje; schildpadtor; hunne gedaanteverwisseling en de door hen veroorzaakte schade) / W.K. de Bruin, 1905.

<http://images.wur.nl/cdm/ref/collection/coll8/id/92>;

Serie: Voor den akkerbouw schadelijke dieren / J. Ritzema Bos. - Groningen : J.B. Wolters, 1905. 12 pl.; Wandtafeln der für den Ackerbau schädlichen Tiere. – Esslingen [etc.] : J.F. Schreiber, 1931. 12 pl.

[http://images.wur.nl/cdm/search/searchterm/SAE01\\_WUR-169](http://images.wur.nl/cdm/search/searchterm/SAE01_WUR-169)

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Ritzema Bos, J.; Handleiding bij de schoolplaten van voor den akkerbouw schadelijke dieren Groningen: [Wolters], 1905. - 46 p. : 12 pl. / tek. W.K. (Wilhelm Karel) de Bruin (1871-1945)  
298379 FORUM - STACKS - 307D38. Alleen de laatste 4 pl. aanw.

[**Collectie wandplaten vakgroepen Entomologie en Fytopathologie, Landbouwhogeschool**] / Londen, B. van ; Meurs, H.H. ; Middelplaats, W.C.Th. ; Schelde, M.P. van der ; Corstanje, N. ; [et al.] [Wageningen, etc.]: [s.n.], 1900-1980 : 305 platen.

FORUM - SPEC.COLL. - BWUR103.001.1001/.1329 / <http://edepot.wur.nl/257167>

\*: The collection Wall charts Entomology and Phytopathology of Wageningen UR Library, Special collections consists of 305 images from the period of around 1900 until 1980. The wall charts were used in classes of the Laboratories of Entomology and Phytopathology to study insect plant relations and plant diseases. Some are printed and can be found in other collections; some are hand drawn by artists and specially made for Wageningen UR. On the wall charts you can find insects and plant pests.

26. Zonder titel (Schildluis), 07-'31 / **Ben van Londen** (1907-1987) [local artist]

Collectie wandplaten Entomologie en Fytopathologie, lade 5, BWUR103.001.1317

<http://images.wur.nl/cdm/ref/collection/coll2/id/236>

27. Jung, H. ; Koch, G. v. ; Quentell, Fr.; Neue Wandtafeln für Zoologie und Botanik Darmstadt: Frommann & Morian, [ca. 1913]. – Taf. 39 *Claviceps purpurea* Mutterkornpilz  
FORUM - SPEC.COLL. – *Not yet available*

28. *Erysiphe graminis* Ascomycetes Erysiphales / **Marinus P. van der Schelde** (1916-1969) [scientific artist]. Wageningen, [1956-1969]

Collectie wandplaten Ento/Fyto, doos 1, BWUR103.001.1218

<http://images.wur.nl/cdm/ref/collection/coll2/id/136>



29. Ziekten en plagen van land - en tuinbouwgewassen

Wageningen: [Min. L&V, afd. Publicaties en Voorlichtingsmiddelen], 1953. - map met 29 pl.

FORUM - STACKS - Vs53193 // FORUM - STACKS - 1299A02

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Mulder, D. ; Butijn, J.; met kleurenplaten door M.P. van der Schelde

Voedingsziekten van fruitgewassen

's-Gravenhage: Staatsdrukkerij- en uitgeverij, 1953. - 64 p. ; 24 kl.pl.

110348 FORUM - STACKS - NN05383,01; <http://edepot.wur.nl/291654>

2e dr. - 's-Gravenhage: Staatsdrukkerij, 1954. - 66 p. ; 28 losse kl.pl.

110449 FORUM - STACKS - 1280C15

30. [Aphids on water plants] [aquarel] / Sudirdja, [ca. 1950]

Original drawings used in: Tjoa Tjien Mo ; Balai Besar Penyelidikan Pertanian di Bogor

Hama-Hama tanam-tanaman kita: II. Buku-gambar berwarna tentang hama-hama kelapa

Djakarta: Noordhoff-Kolff, 1957. - 52 p : ill.

FORUM - STACKS - 294A13

## Display 3: Booming Plant Pathology

### Woman in plant pathology

**Johanna Westerdijk (1883 – 1961)** is surely one of the most famous female scientists of the Netherlands. At age 23, in 1906, she became director of the Phytopathological Laboratory 'Willie Commelin Scholten'. Under her supervision, the laboratory became an internationally respected institution of phytopathology. In 1917, she was offered an associate professorship of Plant Pathology at Utrecht University and became the first female professor in the Netherlands. In 1930, she also became professor at the University of Amsterdam. A total of 55 PhD students earned their degree under her supervision, almost half of which were women. People who knew her well liked how she lived out her motto "For fine minds, the art is to mix work and parties". This extraordinary woman has been a great inspiration for many, especially for women in science.

31. Faasse, P.; Een beetje opstandigheid : Johanna Westerdijk : de eerste vrouwelijke hoogleraar van Nederland. - Amsterdam/Antwerpen: Atlas Contact, [2012]. - 351 pagina's : illustraties.  
FORUM - BOOKS - 505-A/2012-05

*\*:Johanna Westerdijk (1883-1961) was buitengewoon hoogleraar in de plantenziektekunde aan de Rijksuniversiteit Utrecht (1917-1952) en de Universiteit van Amsterdam (1930-1952). Ze was directrice van het Phytopathologisch Laboratorium Willie Commelin Scholten (1906-1952) en het Centraal Bureau voor Schimmelcultures (1907-1958). Onder haar leiding groeide een oude villa in Baarn uit tot het centrum van een wereldomspannend netwerk van wetenschappers en industriëlen. 'Werken en feesten vormt schoone geesten' werd haar levensmotto, in steen gebeiteld boven de deur van het laboratorium. Haar verhaal geeft een verrassende inkijk in de wetenschappelijke wereld van het interbellum en het leven van een buitengewone vrouw.*

32. Westerdijk, J.; Zur Regeneration der Laubmoose  
Nijmegen: typ. F.E. MacDonald, [ca. 1907]. - 65 p., [2] bl.pl  
FORUM - STACKS - 1466D01

&  
Westerdijk, J.; *De nieuwe wegen van het phytopathologisch onderzoek.* - Amsterdam: [s.n.], 1917. - 38 p.  
FORUM - SPEC.COLL. - A2712,25,135 // - CP0003

33. Westerdijk, J. ; Luyk, A. van; Rapport over de proeven tegen den wortelbrand der bieten en tegen het bietenkevertje in 1911. - Amsterdam: Phytopathologisch Laboratorium "Willie Commelin Scholten", 1912. - 5 p.  
FORUM - SPEC.COLL. - C1068,02

&  
Westerdijk, J. ; **Oyen-Goethals, M. van**; Beschadiging van ooftboomen door houtzwammen  
Amsterdam: Phytopathologisch Laboratorium "Willie Commelin Scholten", 1916. - 4 p  
FORUM - STACKS - VS05236

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Westerdijk, J.; De groei der phytopathologie. - Baarn: [s.n.], 1930. - 31 p.  
FORUM - STACKS - NN00434,1930,4

&  
Westerdijk, J.; Afscheidsrede aan de universiteiten van Utrecht en Amsterdam op 22 november 1952 uitgesproken te Hilversum  
FORUM - STACKS - Vs48303

34. Westerdijk, J. ; Baarnsche Studentendom; Tekstboekje : "Alles sal reg kom" : revue, op te voeren door het Baarnsche Studentendom op 14 Maart 1931, bij de viering van het 25-jarig directrice-schap van Prof. Dr. Joha. Westerdijk. - [S.l.: s.n.], [1931]. - 14 p.  
FORUM - STACKS - VS24520

**Suzon Beynon** (1896-1968 - L.E.C. van Bovene-Beynon) was born in Batavia (Netherlands' East Indies) and studied at the Academy of Arts in The Hague. She was an artist skilled in painting, making water-colour pictures, and drawings. She lived and worked in many places

throughout the world, and from 1945 onwards in The Hague. She specialised in symbolic art, decoration, batik technique and books illustrations. In science, she became known because of the [880 \(!\) drawings](#) she made about plant diseases and pests. She made this plant pathology collection, unique and unmatched in the world, for the Research Station for Vegetable and Fruit Research in Naaldwijk. The entire collection is made available through the database Wageningen UR Image Collections.

35. **Bovene - Beynon, Suzon [S]**. van ; W, van de ; Corstanje, N.

[ Verzameling tekeningen van plantenziekten en plantenplagen gemaakt bij het Proefstation voor de Groenten(-) en Fruit(teelt) onder glas te Naaldwijk] / 874 tekeningen gesigneerd door S. [(Suzon), mw. L.E.C. van Bovene-Beynon; 2 tekeningen gesign. door vdW ; 8 tekeningen door N. Corstanje [Naaldwijk: Proefstation voor Groenten en Fruit onder glas], [ca. 1946-1955]. - 1039 tek. : ill.

FORUM - SPEC.COLL. - R393C01 / R393D01 // <http://edepot.wur.nl/368135>

&  
Fremouw, C.A.; De bestrijding van ziekten en plagen bij fruit onder glas. - 2e dr.

Wageningen: [s.n.], 1954. - 40 p.

FORUM - STACKS - NN02833,107

## Dutch elm disease

One plant disease clearly linked to, and even named after, Dutch research is Dutch elm disease. Although it did not originate from the Netherlands (but from Asia), the disease was first described here, by Marie Beatrice Schwartz. She was the first PhD student of Prof. Johanna Westerdijk. She isolated the fungus now known as *Ophiostoma novo-ulmi* from diseased elm and inoculated healthy elms, thus proving that the fungus was the causal agent (Koch's postulates, 1884). Later, another PhD student of Westerdijk, Christine Johanna Buisman, confirmed these findings.

Interestingly, the fungus is spread by *Scolytus* beetles. Adult females feed on healthy trees and lay their eggs in dead or dying trees. The larvae feed on the dead wood which is infested with fungus. When the larvae pupate and adults emerge they feed on healthy trees, thus spreading the disease. The disease is devastating, being able to kill both young and full-grown trees, within a few months. Prevention of this disease is possible when a spore suspension of another fungus, *Verticillium dahliae* is inoculating yearly into the trees. This inoculation triggers a resistance reaction in the tree, preventing it from becoming diseased (systemic acquired resistance). The trade mark name of this suspension, fortunately, also is named after the Netherlands: Dutch Trig.

36. May, C. ; Gravatt, G.F.; The Dutch elm disease. - Washington: [s.n.], 1931. - 10 p.

FORUM - STACKS - NN01288,170

37. Holmes, F.W. ; Heybroek, H.M.; Dutch elm disease, the early papers : selected works of **seven Dutch women phytopathologists**. - St. Paul: American Phytopathological Society, 1990. - 154 p.

FORUM - STACKS - NN35060,1990 // FORUM - STACKS - 539B17

**Westerdijk, Johanna ; Buisman, Christine Johanna.**

De iepenziekte : rapport over het onderzoek verricht op verzoek van de Nederlandsche Heidemaatschappij. - Arnhem: Nederlandsche Heidemaatschappij, 1929. - 78 p.

FORUM - SPEC.COLL. - CP0131

Fransen, J.J.; Iepenziekte, iepenspintkevers en beider bestrijding. - Wageningen: Veenman, 1939. - 118 p

FORUM - STACKS - 274B35 // - NN08202,113 // - 521D21 // <http://edepot.wur.nl/173626>

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Heybroek, H.M.; Dutch elm disease abroad. - Wageningen: De Dorschkamp, 1966. - [8] p.

FORUM - STACKS - NN31534,82

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The dying elms : control measures against Dutch elm disease. - London: [s.n.], 1970. - 3 p.  
FORUM - STACKS - NN30832,78

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Burdekin, D.A. ; Heybroek, H.M.; Dutch elm disease : proceedings of I.U.F.R.O. conference, Minneapolis - St. Paul, September 1973. - Upper Darby: [s.n.], 1975. - 94 p.  
FORUM - STACKS - Vs45215

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Sinclair, W.A. ; Campana, R.J.; Dutch elm disease : perspectives after 60 years : a review  
Ithac Cornell University, 1978. - 52 p.  
FORUM - STACKS - NN15461,8,5

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Scheffer, R.J.; Dutch elm disease : aspects of pathogenesis and control. - Baarn: Scheffer, 1984. - 89 p.  
FORUM - STACKS - 746D11 // FORUM - STACKS - 759C19

## Research institutes, education & phytopathological extension

In 1877 in Wageningen, the first trial station for agricultural practices was founded (DLO: Dienst Landbouwkundig Onderzoek), followed by a new station in Maastricht in 1898 and Naaldwijk, Lisse, Lelystad, Randwijk and Boskoop. In 1997 the experimental services were merged with the just established organisation of the University and the Research Institutes, Wageningen University & Research Centre (Wageningen UR). One of the aims was to study and solve plant diseases and many examples can be retrieved from the library of Wageningen UR.

The establishment of the 'Willie Commelin Scholten Phytopathological Laboratory' (WCS) in Amsterdam in 1894 has been of key importance to plant pathology as a scientific discipline with its many applications in agriculture and horticulture. From WCS a number of other organisations and university chair groups arose, and its history is closely intermingled with that of the Royal Netherlands Society of Plant Pathology (KNPV).

The laboratory WCS was founded with money from a legacy of the rich family Commelin Scholten, whose only son Willie died during his studies in botany and plant diseases. With this money, the new laboratory was founded near the Vondelpark in Amsterdam, focusing on plant pathology research and helping growers to protect their crops. Jan Ritzema Bos was the first director of WCS. Diagnostics and advice were the most important activities during the early years of the laboratory. The most important findings were published in the 'Tijdschrift over Plantenziekten' (the current EJPP) the journal of the KNPV. Jan Ritzema Bos happened to be editor in chief of the journal. When Ritzema Bos moved to Wageningen in 1906, Johanna Westerdijk became the new director of WCS. The laboratory moved to Baarn in 1921 where it became a joint department of phytopathology of Utrecht University, the University of Amsterdam, and in the beginning also the Free University. It became a leading research organisation worldwide. During the late 1980s, general cut-backs in higher education led to the redistribution of the research and the education from Baarn to Utrecht University and the University of Amsterdam. The facilities in Baarn were closed in 1991.

An important Service arose from WCS, during its early years: the Plant Protection Service. In 1899 it was established as Phytopathological Service. The primary aim was to provide planting material from nurseries with health certificates. Jan Ritzema Bos was director until 1918. He took the Service with him to Wageningen when he accepted a position there in 1906. The service became well-known internationally as the Dutch Plant Protection Service and now is part of the Netherlands Food and Consumer Product Safety Authority (NVWA).

From WCS another institute arose: the KNAW Fungal Biodiversity Centre (Centraalbureau voor de Schimmelcultures, CBS). Although originally CBS was not part of WCS, but founded

in 1903 by professor Frits Went, the collection was entrusted to the new WCS director, Johanna Westerdijk, in 1906. Originally the collection was small, consisting of about 80 isolates. Westerdijk expanded this collection to over 10,000 strains of 6,000 different species of fungi and fungal-like species; the largest collection in the world. The aim of CBS was (and is) to keep a variety of fungi in cultures for distribution to research workers all over the world. CBS moved with WCS to Baarn in 1921. Today, the collection is located at the Uithof, the campus of Utrecht University, and consists of more than 100,000 fungal and bacterial isolates.

38. Faasse, P.E.; *In splendid isolation : a history of the **Willie Commelin Scholten Phytopathology Laboratory** 1894-1992*. - Amsterdam: KNAW, , 2008. - VI, 296 p : ill.  
LEEUW - \*HDB 57 - 226-A/2008-001 // <http://edepot.wur.nl/67666>

39. **Plantenziektenkundige Dienst** (Wageningen)

Tijdschrift over plantenziekten / Phytopathologisch Laboratorium 'Willie Commelin Scholten' (Baarn)

Wageningen: Veenman, 1895-1962

FORUM - STACKS - NN02599 - AANWEZIG Jrg. 1(1895)-68(1962)

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Netherlands journal of plant pathology = Tijdschrift over plantenziekten / Nederlandse

Plantenziektenkundige Vereniging ([Wageningen])

Wageningen: PUDOC, 1963-1993

FORUM - STACKS - NN02599 - AANWEZIG Jrg. 69(1963)-99(1993)

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Netherlands journal of plant pathology. Supplement

Wageningen: Nederlandse Plantenziektenkundige Vereniging, 1964-1993

FORUM - STACKS - NN02599A - AANWEZIG 70(1964)-99(1993) Inc.; ingebonden bij NN02599

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European journal of plant pathology

Dordrecht: Kluwer Academic Publishers,

FORUM - STACKS - NN02599 - AANWEZIG Vol. 100(1994)-108(2002)

<http://edepot.wur.nl/58036> full text, 1895-2016

40. Hugo de Vries. Anno 1921, Aet. 72 [gipsen reliëf]

**Hugo Marie de Vries** (1848–1935) was a Dutch botanist and one of the first geneticists. He is known chiefly for suggesting the concept of genes, rediscovering the laws of heredity in the 1890s while unaware of Gregor Mendel's work, for introducing the term "mutation", and for developing a mutation theory of evolution. In Plant Pathology he is well-known as founding father of the WCS and the KNPV.

41. Photographs, mounted on cardboard / PD [Plantenziektenkundige Dienst]. – Wageningen, [ca.1950]

42. Plantenziektenkundige Dienst (Wageningen); Plantenziektenkundige Dienst 100 jaar : centennium 1999. - [Wageningen: Plantenziektenkundige Dienst], 1999. - 7 p.

FORUM - STACKS - VS07371

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Meester, G. ; Woittiez, R.D. ; Zeeuw, A. de; Plants and politics

Wageningen: Wageningen Pers, 1999. - 255 p.

FORUM - STACKS - 1138D09 // FORUM - BOOKS - 512-A/1999-01

43. Meijneke, C.A.R. ; Frankenhuyzen, A. van; Instructieplaten ziekten en plagen in de fruitteelt  
Wageningen: Plantenziektenkundige Dienst, 1963

FORUM - STACKS - 1760A29

## Biological pest control

Crop production often implies the planting of monocultures. These are vulnerable to pests and diseases. But the pest and diseases in turn are also vulnerable if their natural enemies are present. Biological control introduces these natural enemies to the crop, protecting it against damage.

A well-known example is the lady bug beetle. This is a generalist predator (hunter) of many pest organisms, for example aphids. All larval stadia and the adult are effective predators. But many other biological control agents exist, such as predatory mites and bugs, parasitic wasps which lay their eggs in their prey, and parasitic bacteria, fungi and nematodes. Bacteria and nematodes may sometimes be sprayed together on a pest organism; working together to diminish, control or even kill it.

Advantages are the adaptation of population size of the predator (with some delay) to the populations of pest organisms. Also, the predators actively move and search for prey. This is advantageous over chemical contact sprays, which are not effective when they miss their target, and might induce resistance in the pest population.

Introduction of the biological control agent can be done by manually introducing an 'overdose' population into the crop. This strategy is often followed in greenhouses. Alternatively, one can plant extra plant species in border rows, which harbour the predator and other organisms that are pests to the cultured plants. These organisms act as food source for the predator, allowing it to expand its population and move into the crop species. This strategy is often followed in field crops.

Disadvantages of biological control may be that the biological control agent needs some time to develop. Sometimes the biological control agent fails to establish and needs to be re-introduced time after time.

The biggest advantage over chemical crop protection is the absence of toxic residues of chemicals, both in the environment and on the harvested product. Especially in high-value freshly consumed crops, like greenhouse crops, biological control is the standard. A growing number of innovative companies ensure the search for new biocontrol agents and the development of new and efficient rearing and application techniques.

44. Ziektenbestrijdingskalender voor de landbouw 1950. Wageningen: Plantenziektenkundige Dienst, 1950

45. Insekten- en spintbestrijding op appel en peer [poster]. - Arnhem: [s.n.], (1964, 1977)  
FORUM - SPEC.COLL. - RKK.III,Diversen

46. Carson, R.; Silent spring. - New York: Fawcett Crest, 1962. - 304 p.  
FORUM - STACKS - 304E34

&

Nijkamp, J.A. ; Briejer, C.J. ; Hoeks, B.M.; De verontreiniging van het milieu van mens, dier en plant  
Amsterdam: K.N.N.V., [ca. 1962]. - 32 p. – Verslag ... vergadering t.g.v. 60-jarig bestaan KNNV, 1961  
FORUM - STACKS - 752A38

&

Briejer, C.J.; Zilveren sluiers en verborgen gevaren : chemische preparaten die het leven bedreigen  
Leiden: Sijthoff, 1967. - 246 p.  
FORUM - STACKS - 320H05 // 1289A02

47. Barrion, A.; Natural enemies of insect pests of rice [poster] - [Bangkok]: FAO, [ca. 1989]. - 1 bl.  
FORUM - SPEC.COLL. - RKK.III,Diversen

48. Schoevers, T.A.C. ; Haan, J.T. de; Vermeende en werkelijke gevaren verbonden aan het gebruik van giftige bestrijdingsmiddelen in land- en tuinbouw. - 2e, herz. dr. / [bew. door J.Th. de Haan]  
Wageningen: Plantenziektenkundige Dienst, 1937. - 32 p.

49. Goedaert, J. ; Mey, J. de; Metamorphosis naturalis, ofte historische beschryvinghe vanden oirspronk, aerd, eyenschappen ende vreemde veranderinghen der wormen, rupsen, maeden,...

Middelburgh: Fierens, 1669. - 3 dl. in 1 bd. : (ingekl.) pl.

FORUM - SPEC.COLL. - R344D10

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Leeuwenhoek, A. van; De werken. - Leyden [etc.]: Boutesteyn [etc.], 1686-1718. - 14 dl. in 4 bd.

FORUM - SPEC.COLL. - R333E01,1-4 / <http://edepot.wur.nl/131958>

50. *Speeches*

Schoevers, T.A.C.; Biologische bestrijding van schadelijke dieren. - [S.l.: [s.n.], [1917]]. - 8 p.

FORUM - STACKS - VS24096

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Leefmans, S.; Biologische bestrijding van insectenplagen door overbrenging van parasieten binnen het gebied van den Archipel. - [S.l.]: [s.n.], 1926. - 12 p.

FORUM - STACKS - 1287F21

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Leefmans, S.; Biologische bestrijding van insectenplagen en hare toepassing in Nederlandsch Oost-Indie. - Amsterdam: De Bussy, 1929. - 34 p.

FORUM - STACKS - 1287E26

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Lenteren, J.C. van

Plagbestrijding anders : meer dan kunst- en vliegwerk?. - Wageningen: Landbouwhogeschool, 1985. - 37 p.

FORUM - STACKS - NN02963,415 / <http://edepot.wur.nl/242543>

\*: Inaugural speech of the Wageningen professor of entomology. He makes a distinction between five possible approaches in developing entomology. Main subject of his speech is biological versus chemical control. He discusses aspects such as productivity, resistance and research methods of both control systems

&

Vlak, J.M.; De veelzijdigheid van baculovirussen. - Wageningen: Landbouwuniversiteit, 1997. - 24 p.

FORUM - STACKS - NN02963,562 / <http://edepot.wur.nl/237385>

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Kropff, M.J.; Strategisch balanceren : onkruidkunde als toegepaste plantencologie

Wageningen: Landbouwuniversiteit, 1996. - 34 p.

FORUM - STACKS - NN02963,547 / <http://edepot.wur.nl/238119>

*Open access digital resources on plant pathology (in Dutch)*

Beeldenbank Ziekten, Plagen en Onkruiden: <http://databank.groenkennisnet.nl/>

Portal Plantgezondheid: <http://www.plantgezondheid.nl>

Alle artikelen uit het tijdschrift Gewasbescherming van de KNPV in Groen Kennisnet:

[http://www.groenkennisnet.nl/web/show/search?id=3951815&langid=43&from=&to=&webid=3617332&searchid=3961023&keyword=is%2BOR%2Bbronomschrijving%253D%22Gewasbescherming\\*%22](http://www.groenkennisnet.nl/web/show/search?id=3951815&langid=43&from=&to=&webid=3617332&searchid=3961023&keyword=is%2BOR%2Bbronomschrijving%253D%22Gewasbescherming*%22)

Dossiers met leer materiaal Plantgezondheid en Plantenziektekunde:

<http://www.groenkennisnet.nl/nl/groenkennisnet/dossier/dossier-leermateriaal-plantgezondheid.htm>

<http://www.groenkennisnet.nl/nl/groenkennisnet/dossier/dossier-lesmateriaal-plantenziektekunde.htm>

<http://www.groenkennisnet.nl/nl/groenkennisnet/dossier/dossier-veilig-werken-gewasbescherming.htm>

<http://www.groenkennisnet.nl/nl/groenkennisnet/dossier/dossier-vakbekwaam-beschermen-op-het-bedrijf.htm>

<http://www.groenkennisnet.nl/nl/groenkennisnet/dossier/dossier-gewasbescherming-omgeving.htm>