

# Red Ring Disease of Palms



Photos: Brammer and Crow 2001 (Credit: Society of Nematology slide collection)

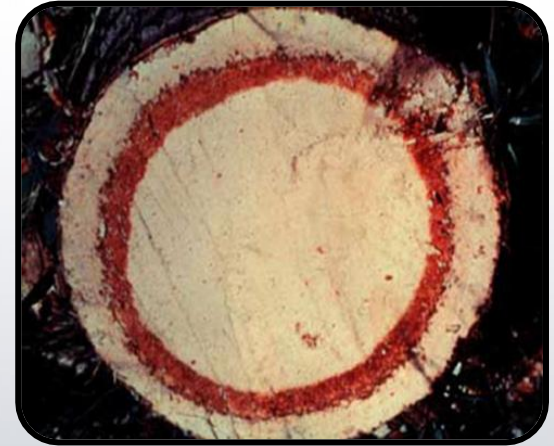


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# Red Ring Disease of Palms

- Caused by red ring nematode
  - *Bursaphelenchus cocophilus*
- First described on coconut palms in 1905
- Vectored by South American palm weevil
  - *Rynchophorus palmarum*
- Infects and damages mainly coconut and oil palms. May affect other members of Palmae family



Photos: (Top) Brammer and Crow 2001 (Credit: Society of Nematology slide collection), (Bottom) Jennifer C. Giron Duque, University of Puerto Rico, Bugwood.org, # 5411179 and 5411180



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# Hosts of the Nematode

Coconut palm (*Cocos nucifera*)



African oil palm (*Elaeis guineensis*)



Photos: (left) USDA Forest Service - Region 8 - Southern Archive, USDA Forest Service , Bugwood.org,#1504001 and (Right) Manfred Mielke, USDA Forest Service, bugwood.org, #1399164



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# Distribution of the Nematode

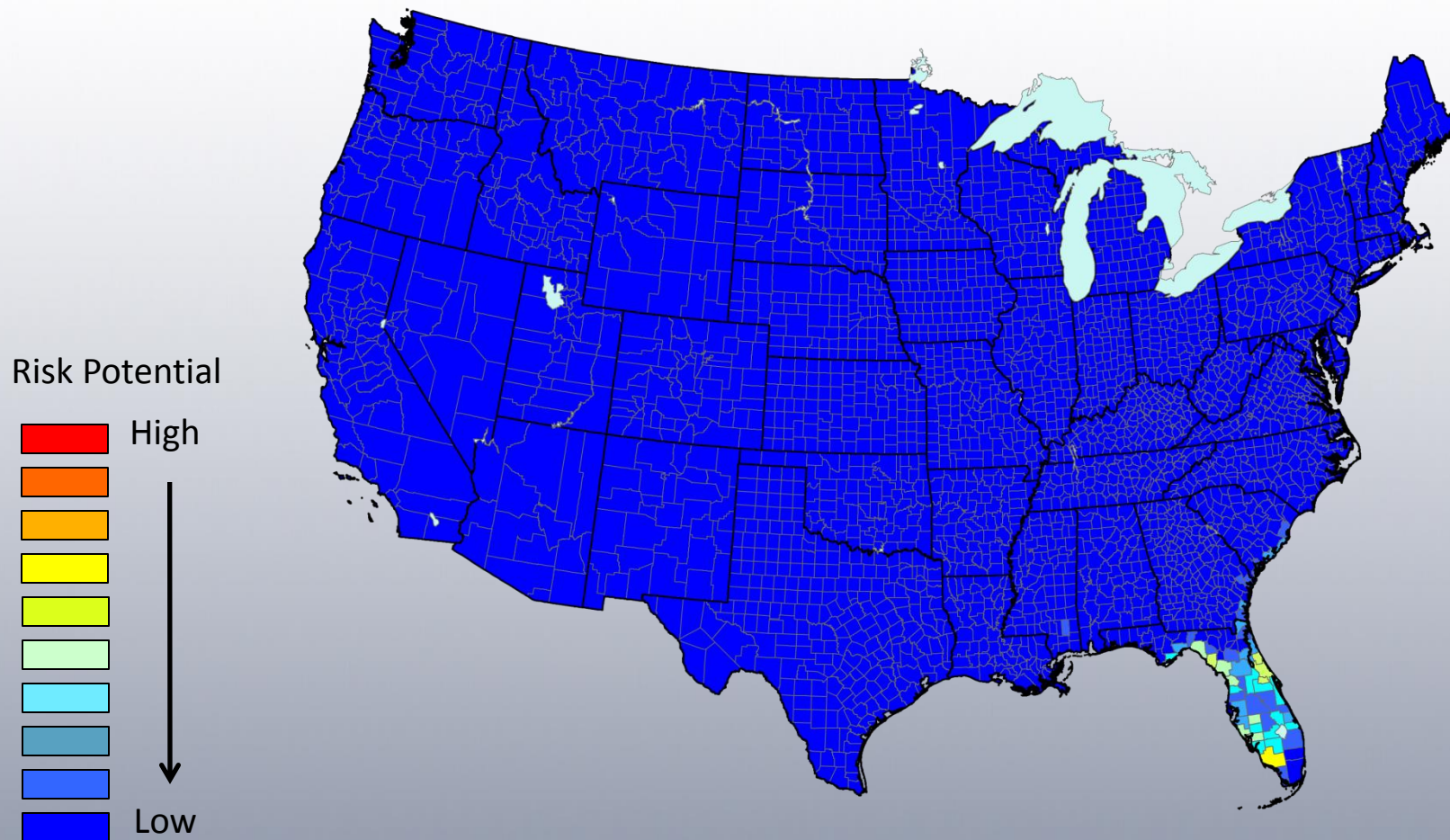
- Located in the Neotropics
  - Mexico
  - Central and South America
    - Such as Belize, Costa Rica, El Salvador, Guatemala, Brazil, Colombia, and Ecuador
  - Some Caribbean countries
    - Grenada, St. Vincent and the Grenadines, and Trinidad and Tobago



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# Risk Map for Red Ring Disease



Map courtesy of NAPPPFAST.

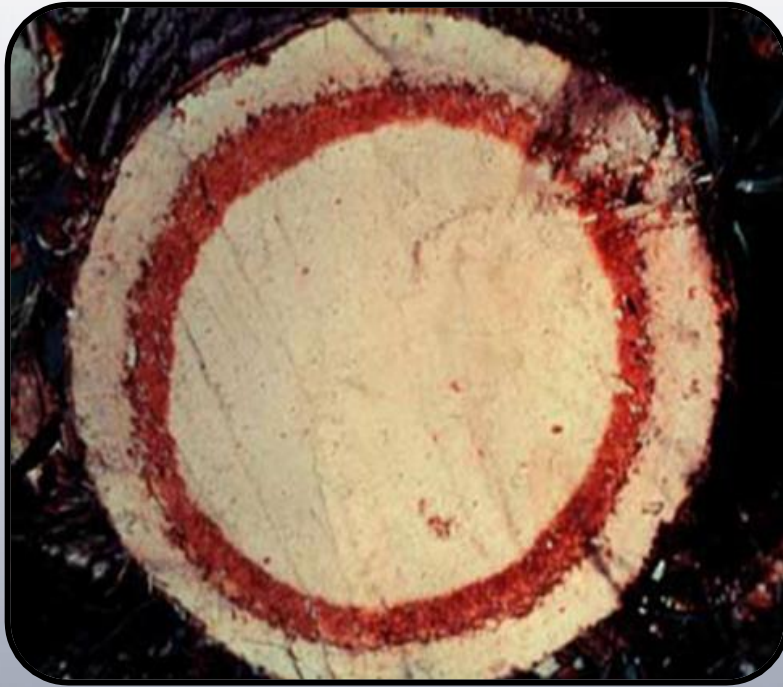


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# Symptoms of the Disease

Red circular band inside the stem (internal)



Yellow wilting (external)



Photos: (Left) Brammer and Crow 2001 (Credit: Society of Nematology slide collection) and (Right) Robin Giblin-Davis, University of Florida



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# Identification of the Nematode

- About 1mm in length
- Too tiny to be recognized by naked eyes
- Closely related to pine wood nematode
  - *B. xylophilus*

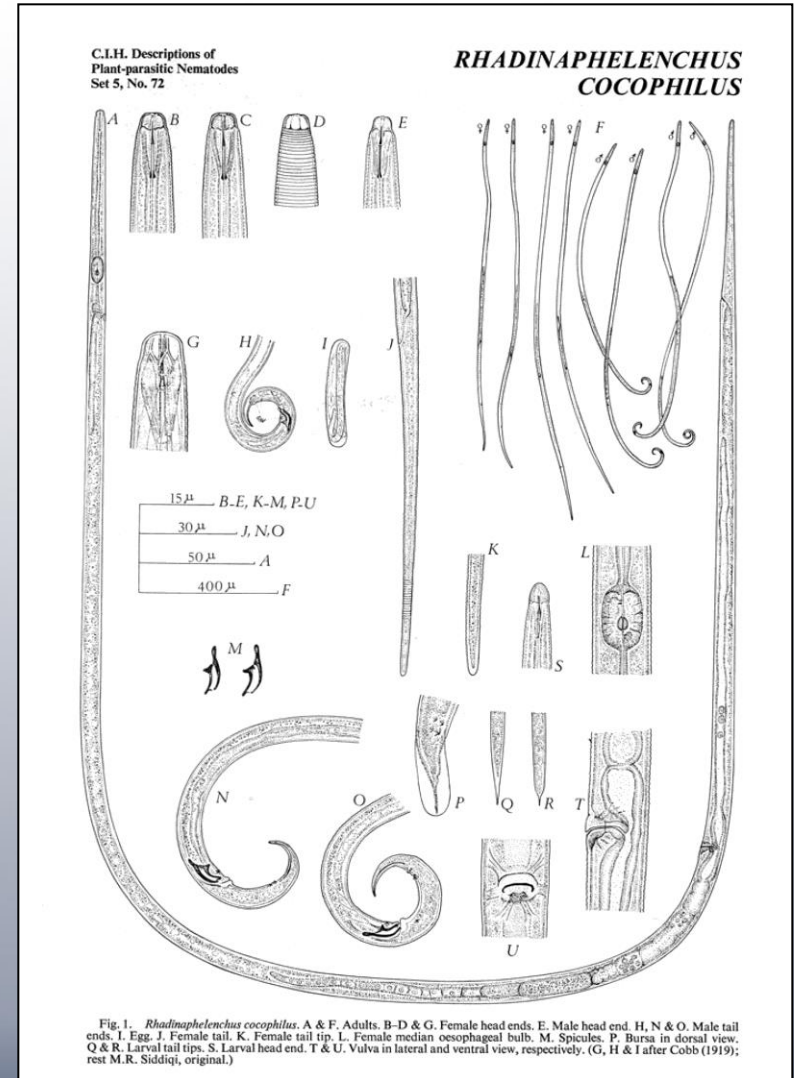


Image credit : Brathwaite, C. W. D. and R. Siddiqi (1975). C. I. H. Descriptions of Plant-parasitic Nematodes Set 5, No. 72. Commonwealth Institute of Helminthology, St. Albans, Herts, England

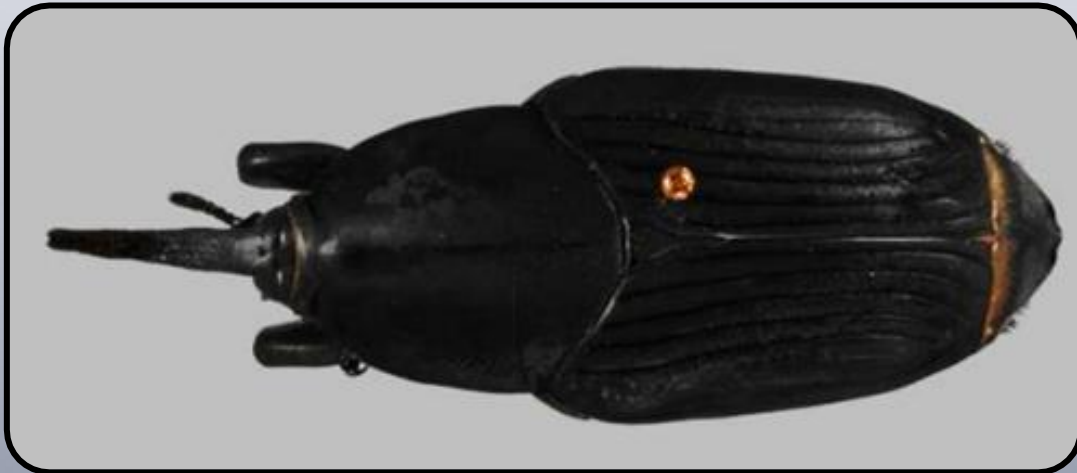


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# Vector of the Nematode

Adult of *Rhynchophorus palmarum*



Photos: Jennifer C. Giron Duque, University of Puerto Rico, Bugwood.org, # 5411179 and 5411180



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# Distribution of the Vector

- Located in the Neotropics
  - Caribbean
    - Such as Grenada, Guadeloupe, and Martinique
  - North America
    - It has been detected in California and Texas, though it is not established there
  - Central and South America
    - Such as Argentina, Bolivia, Brazil, Colombia, Belize, Costa Rica, and El Salvador



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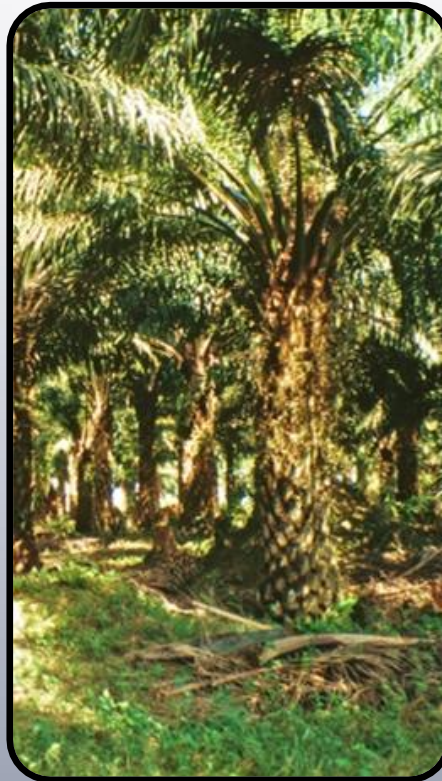


# Hosts of the Vector and the Nematode

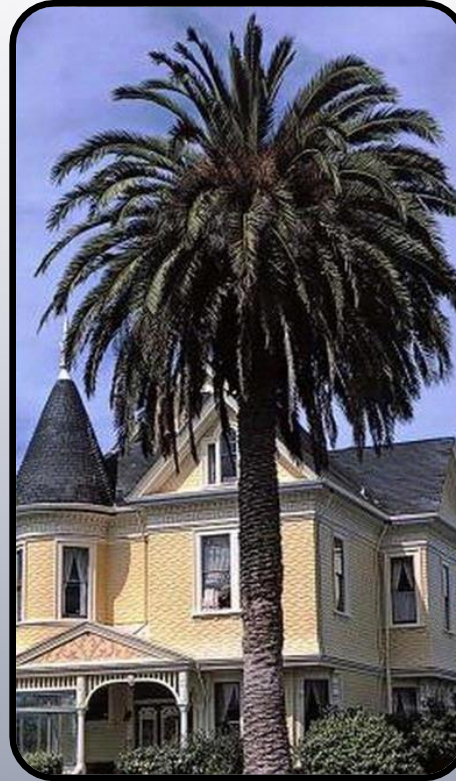
Coconut palm



African oil palm



Canary Island date palm



Date palm



Photos: left to right - USDA Forest Service - Region 8 - Southern Archive, USDA Forest Service , Bugwood.org, #1504001 and (Right) Manfred Mielke, USDA Forest Service, bugwood.org, #1399164; Joseph M. DiTomaso, University of California - Davis, bugwood.org, #5374214, and F.W. Howard, University of Florida, bugwood.org, #0725064



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# The Life Cycle of the Disease

Insect vector



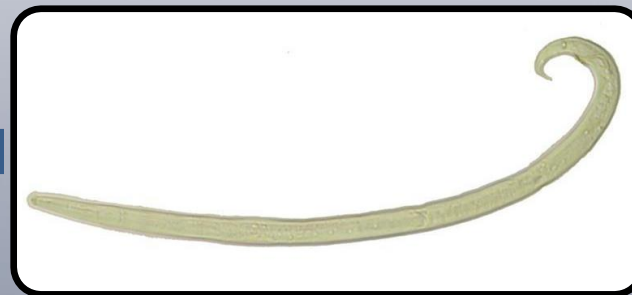
Healthy palm



Diseased palm



Nematode



Photos: (Top left) Jennifer C. Giron Duque, University of Puerto Rico, Bugwood.org, #5411179; (top right) F.W. Howard, University of Florida, Bugwood.org, #0725064; (lower right); Pest and Diseases Image Library, bugwood.org, #5488453, (Bottom left) Robin Giblin-Davis, University of Florida



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# Additional Vectors of the Nematode

Silky cane weevil  
(*Metamasius hemipterus*)



Palmetto weevil  
(*Rhynchophorus cruentatus*)



Photos: left to right - Natasha Wright, Florida Department of Agriculture and Consumer Services, Bugwood.org, # 5178089 and 5178090; Jennifer C. Giron Duque, University of Puerto Rico, bugwood.org, #5411177 and 5411178



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# Monitoring and Management

- Most effective method is phytosanitation
  - Enforcement of phytosanitary actions to prevent the import of palms infested with weevil vectors of the red ring nematode
- Monitoring programs of the weevil vector (*R. palmarum*) of the red ring nematode using aggregation pheromone traps

Trap with lure for the insect vector



Photos: Amy Roda, USDA-APHIS



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# Collaborating Agencies

- U.S. Department of Agriculture Animal and Plant Health Inspection Service (USDA-APHIS)
- Cooperative Agricultural Pest Survey Program (CAPS)
- Florida Department of Agriculture and Consumer Services (FDACS)
- National Plant Diagnostic Network (NPDN)
- Sentinel Plant Network (SPN)
- Protect U.S.
- University of Florida Institute of Food and Agricultural Sciences (UF-IFAS)



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# Educational Disclaimer and Citation

- This presentation can be used for educational purposes for NON-PROFIT workshops, trainings, etc.
- Citation:
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