BioNatural Healing College (BNHC)

Questions Version I

BioNatural Plant Disease Management (Pest Management)

Complete the Questions with the Correct Answers

Name: ---------- DPR License/Certificate----------

Topic 1: Understanding Plant Disease Concepts

What causes plant diseases?

1. The disease of plants is a ---------- like a disease of humans and animals.

A. Complex phenomena
B. Simple process
C. Active process
D. None of the above

To Know Terminology from Plant Pathology

2. ----------is an organism which causes a disease.
   A. a pathogen
   B. a plant
   C. an insect
   D. None of the above
3. ---------- are parasites that typically kill and obtain energy from dead host cells.
   A. Necrotrophs
   B. Biotrophs
   C. Symptoms
   D. None of the above
4. Rust is a type of disease caused by a specific group of fungi, often producing orange-red "rust" colored spores. True ---------- or False ----------

The pathogen

5. The second factor in the plant disease triangle is the pathogen.
   True---------- or False ----------

Types of plant pathogens

6. Biotrophs attack healthy host tissues at any stage. True---------- or False----------

Fungi

7. Most often plant diseases are caused by fungi. True---------- or False----------

Diseases caused by fungi

8. Fungi are unable make their own food, therefore, in the process of obtaining food from higher plants, fungi injure roots, stems, leaves, and fruit.
   True---------- or False----------

How do fungi reproduce?

9. Spores are reproducing by fungi, they exist in different forms such as sclerotia and mycelial fragments. True---------- or False----------

Fungi spore's penetration and plant tissue

10. Spores must germinate and penetrate in the availability of moisture in order for an infection to occur. True---------- or False----------

Direct penetration

11. A germ tube formation is involved in direct penetration by using enzymes and physical pressure. True---------- or False----------

Factor necessary for infection

Moisture

12. Availability of moisture on the plant surface is one of the crucially important factors for most fungus spores to germinate and penetrate plant tissue.
    True---------- or False----------

Bacteria

13. Bacteria are tiny single-celled organisms, much smaller than fungal spores.
    True---------- or False----------

How are bacteria spread? Blowing rain

14. Bacteria ooze (exudate seen coming out of water-soaked lesions) out of infected tissue and form a mass of sticky material on the plant surface due to pathogenic bacteria.
15. True---------- or False----------

Viruses

16. Viruses have the ability to replicate within the host cells, and cause disease, in most cases.
    True---------- or False----------

Diseases caused by viruses

17. Viruses are spreading by various methods depending on virus groups for instance, by insects (aphids, whiteflies), soil (nematodes, soil fungi), and direct contact and cultivation activities. True---------- or False----------

Nematodes

18. Plant-pathogenic nematodes are non-segmented roundworms, they begin the life cycle from the eggs and progress through four juvenile stages until they become adults capable of reproduction. True---------- or False----------

How do nematodes feed?

19. The nematode inserts this spear or stylet into the root tissue, injects a chemical substance, and then withdraws nutrients as it feeds. True---------- or False----------

How does a pathogen invade?

20. First an aggressive attack and compatible response is an interaction that results in disease.
    True---------- or False----------

The plant immune system

21. Plant-pathogen interactions can be considered as a two-way communication process in which not only the plant is able to recognize a foreign organism and defend itself from it, but the pathogen must also be able to manipulate the biology of the plant.
    True---------- or False----------

Chemical weapons of pathogens

22. The enzymes include lipases and cutinizes for breaching the wax and cuticle of aerial parts of the plant. True---------- or False----------

Disease cycles and pathogens association

23. A compatible interaction occurs between a pathogen and plant as a result of that interaction and emergence of disease cycle. True---------- or False----------

Primary inoculum

24. Any structure or part of the pathogen which initiates the disease cycle in a new growing season is called the primary inoculum (or initial inoculum).
    True---------- or False----------

Infection courts

25. When inoculum reaches to certain part of the plants and is susceptible to particular pathogens it's called infection courts. True---------- or False----------

Secondary inoculum

26. A secondary inoculum is the ability of pathogens to produce on an infected plant and distribute the pathogen within the main growing season of the crop.
    True---------- or False----------

Powdery Mildew

27. Initial symptoms of powdery mildew appear on leaves as chlorotic spots on the upper leaf surface. True---------- or False----------

Disease Management: Option for Organically Powdery Mildew

28. Organic grape growers dedicated to disease management include Sulfur, Serenade Max, Sonata, M-Pede, Organic JMS Oil, and Purespray Green horticultural oil (are acceptable on organically certified grapes). True---------- or False----------

Biologicals powdery mildew management

29. *Bacillus pumilis* (Sonata) is a microbial, (44) it can be used at the rate of 2-4 qt per acre with the 4 hours restricted entry interval (R.E.I) and zero (0) preharvest intervals (P.H.I.).
    True---------- or False----------

Fungicidal powdery mildew management

Demethylation Inhibitors (DMIs) include Tebuconazole (Elite 45), Triflumizole (Viticure), Myclobutanil (Rally 40WSP), Tetraconazole (Mettle 125ME), Flutriafol (Rhyme). True---------- or False----------

Soilborne pathogens

30. Worldwide soilborne diseases are the cause of damage to various crops including pre and post-emergence such as Damping-off, Fusarium, Pythium, Rhizoctonia, Phytophthora, Verticillium wilt and nematodes. True---------- or False----------

Damping-off disease

31. A wide range of soilborne pathogens include *Phytophthora spp, Pythium spp, (oomycetes) Fusarium spp, Rhizoctonia spp* (are responsible for the development of damping-off disease). True---------- or False----------

Rhizoctonia root and stem rot on soybean

Rhizoctonia solani is a soilborne fungus, the most common strains that infect soybean are AG-2-2 and AG-4 (Different AG groups can have different optimal conditions for growth and infection). True---------- or False----------

White mold (***Sclerotinia)***

32. Sclerotinia sclerotiorum, S. minor, and *S. trifoliorum* (Several other *Sclerotinia species* cause diseases other than white mold. The pathogen that causes dollar spot of turf

historically has been called *Sclerotinia homoeocarpa*, but is likely to be reclassified as *Lanzia or Moellerodiscus*). True---------- or False----------

Sudden Oak Death

33. The disease called "Sudden Oak Death" is the result of lethal stem cankers in the inner bark that expand and girdle the stem, killing the tree. Examples: symptoms of certain oak family trees. True---------- or False----------

Grown gall

34. Gall may occur on roots, stems, even leaves. Therefore, tissue has disorganized growth with an enlarged cambium layer and irregular vascular tissue.
    True----------or False----------

Tree diseases notes: Bacterial leaf scorch

35. *Xylella fastidosa* is a bacterium that grows inside the plant's vascular tissue where it blocks water transport abilities of the plant from roots. True----------or False----------

Management

36. Many cultural practices can prevent and reduce the incident of disease. Chemical controls are not effective option. True---------- or False----------

Herbaceous Plants and their diseases

37. African daisy (Gerbera) *Pythium*, root rot. True---------- or False----------
38. Pansy (*Viola*) – anthracnose, black root rot, Botrytis blight, Cercospora leaf spot, Phytophthora root/crown rot, Pythium root/crown rot.
39. True----------or False----------

Topic 2: BioNatural Plant Disease Management (BNPDM)

40. BNPDM is ecologically and environmentally friendly approaches to the management of plant diseases; particularly here in this section, soilborne pathogens are the focus of consideration due to inadequate control and use of chemicals fungicides.
    True---------- or False----------

Exclusion

41. Local law or quarantine by region, state, country, or international that prevents the movement of disease-causing agent. True---------- or False----------

Smart cropping system

42. Crop rotation, mixed cropping, intercropping are useful techniques that are widely applied around the world to avoid the inoculum buildup of soilborne pathogens.
    True---------- or False----------

Soil solarization

43. It can be performed during the hot summer season by placing transparent plastic sheets over the production field. True---------- or False----------

Biofumigants

44. Biofumigants are one of the forms of BioNatural technique that researchers have used to utilize the family Brassicaceae such as cabbage, cauliflower, broccoli, kale, radish, turnip, canola, rapeseed and others of the Mustard plant family which can be effectively used to stop soilborne pathogens. True---------- or False----------

Anaerobic soil disinfestation (ASD Biological soil disinfestation)

45. It is a process of disinfesting the soil by making it anaerobic using easily decomposable amendments such as rice bran, fresh crop residues, and soybean flour.

True---------- or False----------

Soil amendments

46. BioNatural healing in the form organic amendments to the soil is used for improving soil health and crop productivity as well as suppressing soilborne plant pathogens.
    True----------or False----------

Soil health and plant nutrition

47. Soil health covers soil pH, nitrogen, phosphorus, potassium, calcium, zinc levels and other nutrients which can play an important role in the management of soilborne plant pathogens.
    True----------or False----------

Why is important mineral nutrition in the suppression plant diseases

48. Sustaining plant health, along with suppressing plant diseases depends on proper supply of nutrition which is one of the important components of BioNatural Pest Management.
    True---------- or False----------
49. The primary macronutrients include nitrogen (N), phosphorous (P), and potassium (K).
    True---------- or False----------

How nutrients play role in reducing plant disease severity?

Nitrogen (N) and plant disease

50. Studies have shown that when a disease is caused by the facultative parasites like *Fusarium oxysporum, Alternaria solani* and *Xanthomonas sp* high N supply decreases the severity of the infection. True---------- or False----------

Potassium (K) and plant disease

51. In potatoes, potassium application was found to decrease the incidence of several diseases for instance, late blight (*Phytophthora infestans*), dry rot (*Fusarium sp*), powdery scab (*Spongospora subterranean*), and early blight (*Alternaria solani*).
    True----------or False----------

Magnesium (Mg) and plant disease

52. Mg fertilization plants in reducing the disease severity for example, rice, wheat citrus, potato, poppy, and peanut. True---------- or False----------
53. Iron (Fe) plays a major role as a micronutrient in the controlling of plant disease and improving plant health such as in energy transfer, as an activator for enzymes that control respiration, for chlorophyll formation, for chloroplast, and enzyme component.
    True---------- or False----------

Association of plant immunity and plant pathogens

54. Plants have a unique system of defense if compared to the human body's immune system, plants have evolved with a stunning structural, chemical, and protein-based defenses designed to detect invading organisms and stop them before they are able to cause extensive damage. True---------- or False----------

Understanding of plant-microbe interactions and plant disease formation

55. The healthy plants with their constitutive mechanism as physical barriers display an excellent ecosystem for microorganisms, because the spectrum of interactions among the microbes comprise of both mutualistic and pathogenic.
    True---------- or False----------

Disease conditions for host, pathogen, and environment

56. A plant disease is the condition that occurs between a susceptible plant described as a compatible host which is infected by an aggressive pathogen under the favorable environmental conditions that favor disease.

True----------or False----------

Role of recognition factors in plant diseases

57. Without the proper recognition, factors such as surface cells between pathogen and plants species or varieties may not be infected.
    True----------or False----------

Host receptors and sites for toxins

58. After all the compatibility between host receptors and pathogens, only the plants that have sensitive sites are susceptible to become diseased.
    True----------or False----------

Case study pathogens overcome plant defense mechanisms

59. If a pathogen is capable of suppressing basal defense, plants may respond with another line of defense it is called hypersensitive response (HR).
    True----------or False----------

Apple scab (Fungus disease)

60. Spring is the season with the first visible symptoms of apple scab such as pale, water-soaked spots the size of a pinhead on the new leaves.
    True----------or False----------

Anthracnose of turfgrass

61. The fungus Colletotrichum cereale overwinter as mycelium or conidia associated with previously infected plant tissue and survive as darkly pigmented aggregates of hyphal cells (stromata), that are formed on stolons and at the base of tillers.
    True---------- or False----------

Citrus Greening (Huanglongbing)

62. There are three species such as Africa *Candidatus Liberibacter africanus* (LAF), Asia *Candidatus Liberibacter asiaticus* (LAS) and *Candidatus Liberibacter americanus* (LAM). True----------or False----------

Leaf scorch

63. Symptoms of this disease are often confused with those caused by drought. Leaves on one or more branches may yellow and begin to droop; soon the margins of the leaves turn a deeper yellow or brown, and the leaves eventually die.
    True---------- or False----------

Tomato spotted wilt

64. The tospoviruses are transmitted by thrips (*Thysanoptera*: *Thripidae*) and replicate in both the thrips vectors and the plant hosts.
    True---------- or False----------

Phytochemical defenses against fungal pathogens

65. The phytochemicals also induce structural modifications of the hypha and mycelia thus inhibiting production of substances such as aflatoxin and fumonisin from some of fungi such as *Aspergillus spp* and *Fusarium spp.*, respectively.
    True----------or False----------

Phytochemicals defenses against bacteria pathogens

66. Gram-negative bacteria are more susceptible than gram-positive bacteria due to the absence of a peptidoglycan cell wall. True---------- or False----------

Phytochemicals defenses against nematode pathogens

67. The activity of *Melia azedarach* (commonly known by many names such as chinaberry tree, Persian lilac, Pride of India, bead-tree, Cape lilac, syringa berry-tree), against *Meloidogyne sp* (Root-knot nematode). True----------or False----------

Organic disease control

68. Organic farming (OF) can be defined as an ecologically, economically and socially responsible way of farming, providing an enduring supply of safe and healthy food and fibers, with least possible losses of nutrients and energy and the least negative impacts on the environment. True----------or False----------

Limiting pathogen entry by minimizing initial inoculum

69. The use of healthy clean seeds or vegetative propagating materials, crop rotation, spatial isolation and removal of certain weeds. True---------- or False----------

Pathogen control with curative methods in OF

70. Copper fungicides are considered mined natural products and are allowed for use against bacterial and fungal diseases, however, in some parts of the world where it is restricted, use of copper fungicides are increasing. True----------or False----------

Classification of fungicides

71. In general concepts, fungicide is classified as protective or systemic. Protective fungicides with its mode of action are usually effective against a wide range of fungi. True----------or False----------

Systemic fungicides

72. This type of fungicide is absorbed by the plant and transported to the site of infection. True----------or False----------

Benefits of useful rules for fungicide application

73. Once a disease has started, it would be difficult to eradicate it, however, many fungicides have systemic modes of action, but it will not completely eradicate after diseases have started. True----------or False----------

Why are alternative fungicides needed?

74. Fungicides should be maintaining a final plan of action as far as concerns for fungal disease management and the application of fungicides. True----------or False----------

Actinovate AG

75. 0.0371% Streptomyces lydicus strain WYEC 108. Labeled for suppressing several foliar and soil-borne diseases on many crops; diseases and crops listed separately. True----------or False----------

Let us consider a few examples of least-toxic fungicides for roses as a case

76. One of the distinctive characteristics of fungal spores and many fungal species germinate best under acidic conditions, however, baking soda solutions are significantly more alkaline. True----------or False----------

Foundations of fungicide resistance

77. One of the reasons to know that resistance is a contributing factor in unsatisfactory fungicide application. True----------or False----------

BioNatural Disease Management

78. Biopesticides which is a broad term, according to U.S. EPA biopesticides are derived from natural materials such as animals, plants, bacteria, and certain minerals. True----------or False----------

Microbial secondary metabolites in plant disease management

79. The common beneficial microbial metabolites include Plant-Growth-Promoting Rhizobacteria (PGPR), and Plant Growth-Promoting Fungi (PGPF), normally residing in rhizosphere on root surface or endophytes in the host plants.
    True----------or False----------

Association of Plant-Growth-Promoting Rhizobacteria (PGPRs) and plant pathogens

80. Are beneficial free-living bacteria that colonize roots and promote growth health of plants for instance, nitrogen fixation, phosphate solubilization, production of phytohormones and siderophores.
    True----------or False----------

***Pseudomonas spp* and plant disease**

81. The genus of *Pseudomonas* has the ability of colonizing a wide-spread of niches and function as effective bio-control agent (BCAs) on *Fusarium* disease crops.
    True----------or False----------

Association Plant Growth-Promoting Fungi (PGPF) and plant pathogens

82. It is important to note that PGPF like PGPR play a significant role in controlling plant diseases caused by *Fusarium spp*. True---------- or False----------

Association of Arbuscular mycorrhizae fungi (AMF) and plant disease

83. The AMF form beneficial symbiosis in most terrestrial ecosystems and crop production system. True----------or False----------

Role of ISR (Induced Systemic Resistance) in plant

84. Both Induced systemic resistance (ISR) and Systemic acquired resistance (SAR) are two different phenomena but represent active plant defense responses in respect to plant pathogens attack. True----------or False----------

Systemic Acquired Resistance (SAR)

85. SAR once induced remains active against broad range of pathogens for prolonged time and it not only resist pathogen attack but also cure disease if occurred.
    True----------or False----------

Diagnosing plant diseases

86. Diagnosis is the process of determining the cause of plant disorder.
    True----------or False----------

Components of diagnosis

87. The more accurate this information is and the better the sample submitted, the greater the opportunity for an accurate diagnosis by a laboratory diagnostician.
    True----------or False----------

Observation

88. A good observer will develop a description of the symptoms and symptom development or progression, with specific and detailed as possible.
    True----------or False----------

Sample collection

89. Plant samples collection is another significant part of diagnosis process in plant diseases management. True----------or False----------

Confirmation of cause

90. first, after if the organism (s) is identified especially involved by the prevalent environmental conditions and known to cause disease on the plant infected.

True----------or False----------

Recommendation

91. Determine if the damage is sufficient and required for proper action.
    True---------- or False----------