

**SECTION V: TRAINING REFERENCE MATERIALS**

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## 5.1 TRAINING REFERENCE MANUALS

The daily performance of Interior Pest Exclusion Program activities requires use of several manuals and handbooks to carry out essential functions effectively and meaningfully. Inspectors work closely with Federal (USDA), State (CDFA) and County (CAC) officials. Manuals are not listed in order of importance. Each one serves a definite purpose. None of the manuals can be used with any confidence if they are not kept up-to-date. It is essential that inspectors know how to use each manual correctly and efficiently. As technology changes it is CDFA's goal to place state issued material on the internet/online.

### 5.1.1 CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE MANUALS

#### 1. [California Food and Agricultural Code](#)

The California Food and Agricultural Code, more commonly known to most of us as the Ag Code, contains laws relating to plant and animal industry. Each section of the code, amendment, or revision must pass through the State Legislative process in order to become legal. The code provides legal authority to the California Department of Food and Agriculture to establish quarantines that protect and promote the state's agricultural industry. A section of the code gives authority to a State plant quarantine officer to reject plants and other restricted articles that arrive in the State that have been moved in violation of a Federal/state/county regulations.

#### 2. [Plant Quarantine Manual](#)

The California Code of Regulations (CCR) is an official publication of the State of California. The CCR contains law which has been promulgated by individual state departments or agencies according to authority granted by the Legislature. Regulations that pertain to plant quarantine are assembled together in the Plant Quarantine Manual, for quick reference by plant quarantine officers. The regulations include federal foreign, territorial and domestic quarantines; state exterior and interior quarantines as well as county restrictions.

#### 3. [County Procedural Training Manual](#) (*Login Access required*)

If you are reading this page, then you either have access or got a copy of the manual. This is the manual. It is a combination of several manuals; Quarantine Commissioners Circular, County Pest Exclusion Training, Plant Quarantine Inspection Training Aid etc.

#### 4. [Agricultural Commodity Identification Aid Manual](#)

The manual is a pictorial guide created as an aid to assist Agricultural inspectors and other users with the identification of exotic commodities not normally encountered in California. The commodities are additionally indexed by common or scientific names.

#### 5. [Commodity Treatment Manual](#) (*Login Access required*)

This manual addresses specific commodity treatment needs of California. It is complementary to the USDA/ APHIS/ PPQ Treatment Manual.

#### 6. [Pest Ratings and Mitigating Actions](#) – California Code of Regulations, Section 3162

This publication is available online only. It is based on the "Action Oriented Pest Rating System." Pests are rated (A, B, C, D, Q, etc.) to provide guidance upon the regulatory action to be taken.

### 5.1.2 USDA/APHIS/PPQ MANUALS

#### [Link to All USDA Electronic Manuals](#)

1. [Cut Flowers and Greenery Import Manual](#)  
This manual provides the background, procedures, and reference tables for regulating the fresh, cut portion of the plant when it is imported for decoration or ornamentation, and for protecting plants that are threatened with extinction due to trade in those plants or their derivatives.
2. [Export Program Manual](#)  
The Export Program Manual is a guide to Federal, State and County staff responsible in the inspection and certification of plants and plant products and issuing export certificates. The manual covers information about USDA's EXCERPT, an electronic database that provides information on import requirements of foreign countries. It also provides the methods and procedures for certifying plants and/or plant products offered for export.
3. [Fruits and Vegetables Import Requirements \(FAVIR\) Online Database](#)  
This online reference allows easy access to regulations and information pertaining to the importation of fruits and vegetables into the United States.
4. [Hawaii Manual](#)  
This manual is used for regulating plants, plant parts, and products intended for both propagative and nonpropagative purposes. It is used also for regulating carriers originating in Hawaii and moving to other parts of the United States.
5. [Miscellaneous and Processed Products](#)  
The manual is used for regulating imported items that are processed and are not intended for propagation.
6. [Plants for Planting](#)  
This manual is used for determining if the status of a plant genus is restricted, prohibited or generally admissible for import in to the U.S. with propagation as its intended use. This manual covers all form of propagative material, including seeds intended for planting.
7. [Post Entry Quarantine Manual for State Inspectors](#)  
This manual covers procedures for conducting PEQ tasks beginning with the request to approve a growing site and ending with the release or refusal of the plant material.
8. [Puerto Rico Manual and the U.S. Virgin Islands Manual](#)  
This manual is used for regulating plants, plant parts, and products intended for both propagative and nonpropagative purposes. It is used also for regulating carriers originating in Puerto Rico or the U.S. Virgin Islands and moving to the United States or other territories
9. [Treatment Manual](#)  
Treatment schedules listed in the manual are used to eradicate plant pests of quarantine significance found in, on, or with commodities offered for entry into, export from, or for movement within the United States. The manual also serves as a reference for researching the types of treatments available for imports and to answer questions from importers, industry, and foreign countries.

## 5.2 REGULATIONS AND LIFE HISTORIES OF SELECTED PLANT PESTS

### 5.2.1 CITRUS CANKER - *XANTHOMONAS CAMPESTRIS* PV. CITRI

#### Quarantines

- State Exterior (CCR 3250)
- Federal Domestic (CFR 301.75)
- Federal Foreign (CFR 319.28)

#### Type of Pest - Bacteria

**Host** - Citrus are susceptible to this disease. Grapefruit seems most susceptible followed by limes, sweet orange-Valencia etc and lemons, in order of the decreasing susceptibility.

**Symptoms** - The first evidence of the disease is young lesions that appear on the leaves as small yellowish spots about the size of a pinhead (1/16" in diameter) usually found on the lower surface. The lower lesions soon become a small, white, spongy eruption on the lower surface, which usually turn tan or brown. The upper surface lesions are often ruptured and sponge like. Often there is a watery, glazed margin around the eruptions, which may be somewhat raised and yellowish-brown to green in color. In a few weeks, on an actively growing leaf, a lesion may be 3 to 4 mm in diameter, brown and roughened on both surfaces with a chlorotic area around the main lesion producing a watery, halo-like appearance and is yellow, shading into normal green. The older lesions become brown, hard, corky, lignified and more irregular than the young circular lesions. On the fruit, cankers are similar to the leaf symptoms except that they do not commonly show the yellow halo and have a more crater-like appearance with the margins being elevated and the centers sunken. Branch and twig cankers are often several inches long.

**Inspection for Citrus Canker** - The disease may be distinguished from other diseases by the following features of the lesions:

1. Elevated and apparent to touch on both surfaces
2. Have glazed margins with oily appearance
3. Crater-like appearance, best observed with a hand lens or microscope.

### 5.2.2 GUMMOSIS OF SUGARCANE - *XANTHOMONAS VASCULORUM*

**Quarantine** - Federal Domestic (CFR 301.87)

#### Type of Pest - Bacteria

**Hosts** - The primary host of this disease is sugarcane, but it may also be found infecting Johnson grass, Sudan grass, maize, bamboo, and several species of palm.

**Symptoms** - Yellow to orange streaks, often with red flecks, on mature leaves are characteristic symptoms of gummosis disease. These streaks follow the vascular bundles and may be several centimeters in length, but only 3 to 6 mm wide. Systemic infection results in short, narrow, dark red, gum filled streaks on the blade of young leaves and the underside of midribs that extend onto the sheaths. Chlorotic areas often appear in a single leaf, or on several leaves on an infected plant, usually with scattered reddish spotting. The chlorosis may disappear followed by normal growth, but more often the infected plant is killed.

**Transmission** - The primary means of spreading of this disease is through the use of diseased sets or cuttings. The disease may be further disseminated when planting materials are cut using a contaminated knife.

**Inspection for Gummosis** - Check host plants for above symptoms. Submit any suspicious plants to CDFA Plant Pest Diagnostic Laboratory, Pathology Unit for identification.

### 5.2.3 LEAF SCALD OF SUGARCANE - *XANTHOMONAS ALBILINEANS*

**Quarantine** - Federal Domestic (CFR 301.87)

**Type of Pest - Bacteria**

**Hosts** - Although only sugarcane has been found infected naturally, several other plants are susceptible, including bamboo grass and corn.

**Symptoms** - Typical foliar symptoms sometimes referred to as the “chronic phase” of the disease, consist of narrow, elongated, light colored lesions with well defined margins that may extend onto leaf sheaths. These symptoms occur on stunted plants with leaves held stiffly upward and curled inward with scalded apical ends. Vascular bundles, as seen in longitudinal sections of diseased stalks, are discolored bright red, particularly in the nodes and where shoots arise. Plants affected by the “acute phase” of the disease may show none of the above symptoms before they suddenly wilt and die. Typical symptoms may appear later in stalks that arise from the bases of dead stalks.

**Transmission** - Most often the disease is spread through the use of infected seed cuttings and knives. The bacterium can be transmitted to healthy canes by a cutting knife used on infected canes.

**Inspection or leaf scald** - Inspect plants for symptoms as listed above. Submit any suspicious plants to CDFA PPD, Pathology Lab for further identification.

### 5.2.4 PIERCE'S DISEASE – *XYLELLA FASTIDIOSA*

**Quarantine** - State Miscellaneous Ruling (CCR 3650)

**Type of Pest - Bacteria**

**Hosts** - The bacteria attacks grape vines and is referred to as Pierce’s Disease. The pathogen also causes Almond Leaf Scorch in almonds, Alfalfa Dwarf in alfalfa, Oleander Leaf Scorch in oleander and Citrus variegated chlorosis in citrus.

**Transmission** - A leafhopper, the Glassy-winged Sharpshooter (*Homalodisca coagulata*), is a major vector.

**Symptoms** - Vines develop symptoms of the disease when the causal bacteria cause a blockage of the water conducting system, greatly reducing the flow of water to leaves. The first evidence of Pierce’s Disease infection is usually a drying or “scorching” of leaves. Foliar symptoms gradually spread out toward the cane from the point of infection. The oldest leaves show severe scorching and the youngest leaves may not have any symptoms. Eventually the canes become affected and dieback along with the roots.

**Inspection for Pierce’s Disease** - Symptoms of several other grape disorders can be confused with Pierce’s Disease. Eutypa dieback symptoms in spring mimic those of Pierce’s Disease. Nutrient deficiencies cause similar symptoms. Excessive salt build up in the soil and herbicide injury can cause similar symptoms. The time of appearance, extent, and severity of symptoms depend to some degree on temperatures and available soil moisture. Shallow soils, moisture stress, or very high temperatures can cause sudden collapse of vines or portions of vines. Pierce’s Disease has more severe effects in hot than cooler climates. In California symptoms tend to appear sooner and vines die more quickly in the Central Valley than coastal regions. Although no European grape variety is immune to Pierce’s Disease, some varieties always have fewer vines infected and decline much more slowly after infection is evident.

**Link:** [CDFA Pierce’s Disease Control Program](#)

### 5.2.5 BLACK STEM RUST – *PUCCINIA GRAMINIS*

**Quarantine** - Federal Domestic (CFR 301.38)

**Type of Pest - Fungus**

**Hosts** - Wheat, barley, oats, rye, wild grasses, barberry, Mahonia, and Mahoberberis.

**Symptoms** - The disease is widespread and requires alternate hosts like barberry, Mahonia, Mahoberberis, etc to complete its life cycle (heteroecious), its development can be restrained by eliminating alternate hosts. In the northern states, the fungus overwinters on wild grasses and grain straw. The black or teliospore stage germinates in the spring, producing sporidia spores, which infect leaves of the alternate hosts. These sporidia spores cannot infect grains or grasses. The disease on the alternate hosts produces two types of spores, pycniospores which appear on the upper surface of the leaves and the aeciospores which are produced on the underside. The latter spore infects nearby grains and grasses, which in turn produce the red urediospores. Red spores spread from grain to grain or grasses to grasses throughout the growing season. The black teliospores are then produced and the life cycle is complete. In the South, the rust may overwinter in the red stage and spread north as the season advances. The disease does not reach economic levels in California because few alternate hosts exist.

#### 5.2.6 CEDAR-APPLE RUST - *GYMNOSPORANGIUM JUNIPERI-VIRGINIANAE*

**Quarantine** - State Exterior (CCR 3274)

##### **Type of Pest - Fungus**

**Hosts** - Many species of juniper (*Juniperus* spp.) and nearly all species of apple and crabapple (*Malus* spp.) Description – A heteroecious pathogen which passes part of its life cycle on apple trees, and a part on susceptible species of junipers.

**Symptoms** - The symptoms on apple begin as yellowish spots, up to ½" in diameter in size, on leaves and, occasionally, on young twigs and immature fruits. These lesions turn orange, and bright orange bands finally develop around the orange centers. Tiny pimples, visible on magnification, may appear on the upper surface of the lesion. The lower surface, of the leaf, may produce tiny cups filled with brown powder (aeciospores). On juniper, galls somewhat spherical in shape, form on leaves and stems. They are brick red to chocolate in color and may vary from 1/16" to 2" in diameter. The galls are smooth when young; becoming rougher surfaced with age. Juniper trees may show only a few galls, or they may be so heavily infested that their branches begin to bend with the weight of the spores.

**Life Cycle** - Cedar-apple rust may be found in apple trees from April through August and in junipers from September to mid-summer of the following year.

**Inspection for Cedar-Apple Rust** - Check both apple and juniper for symptoms as described above. Any host plants showing these should be submitted to CDFA Plant Pathology Lab for further identification. The disease could be confused with apple scab. A common apple disorder found throughout the apple growing regions of the world. Apple scab also produces lesions on apple fruits and leaves, however these lesions are generally brownish to black in color and have a corky texture.

#### 5.2.7 CHESTNUT BARK DISEASE (CHESTNUT BLIGHT) – *ENDOTHIA PARASITICA*

**Quarantine** - State Exterior (CCR 3251)

##### **Type of Pest - Fungus (Ascomycete)**

**Host** - All species and varieties of chestnut, *Castanea* spp., and Chinquapin, *Castanopsis* spp.

**Symptoms** - Conspicuous reddish bark cankers form on trunk and limbs. Thereafter, the bark swells and splits longitudinally. As limbs are girdled the foliage blights so that brown shriveled leaves can be seen from a distance. The fungus spores abundantly in crevices of broken bark; first producing conidia extruded in yellow tendrils from reddish pycnidia and later ascospores from perithecia embedded in orange stromata\*. Fans of buff-colored mycelium are found under affected bark.

**Transmission** - The ascospores can be carried by wind for many miles landing in open wounds, but the sticky conidia are carried by insects and birds. The fungus can live indefinitely as a saprophyte.

**Control** - Quarantine of host material from the infested areas is the only means of control. Development of resistant varieties holds the greatest hope.

**Inspection for Chestnut Bark Disease** - The reddish bark cankers are perhaps the most obvious symptoms. The yellow tendrils of conidia should be discernible, with the aid of hand lens, as small threads if they have not been washed away. The pycnidia are minute chamber embedded in the bark. The orange stromata should be easily demonstrated even if the perithecia cannot be found. The buff-colored mycelium under the bark should be considered an indication of the fungus.

\*Stromata are a mass of fungus hyphae often including host tissue containing or bearing spores.

### 5.2.8 CHRYSANTHEMUM WHITE RUST – *PUCCINIA HORIANA HENN.*

#### Quarantines

- State Interior (CCR 3428)
- Federal Domestic (CFR 319.27)

#### Type of Pest - Fungus

**Hosts** - Twelve species of chrysanthemum are susceptible. Major susceptible varieties include *C. morifolium* x *C. spp.* hybrids (Florists chrysanthemum and Garden or Hardy mums), Nippon daisy, High daisy and *C. pacificum*. Some varieties are resistant to CWR, including annual chrysanthemum (*C. carinatum*), crown chrysanthemum (*C. coronarium*), pyrethrum (*Tanacetum coccineum* = *C. coccineum*), marguerite daisy (*Argyanthemum frutescens*), ox-eye daisy (*Leucanthemum vulgare*), shasta daisy (*Leucanthemum X superbum* = *C. maximum*), corn marigold (*C. segetum*)

**Symptoms** - CWR appear as small light green to yellow spots on the upper surface of infected leaves. The spots, which may be dimpled, later turn brown and necrotic/white. Buff to pink colored pustules are formed on the under surface of leaves, especially on young leaves and flower bracts. Pustules can also be found on any green tissue and flowers. Symptoms are limited or absent during hot and dry weather and can be suppressed by fungicide applications. Symptoms appear during cool, wet conditions and usually develop within 5 to 14 days after infection.

The disease is moved from infected stock to healthy plants primarily by splashing water that contains spores. Free water on the leaves is necessary for spore development. Under optimal conditions, new infection can be established in as little as five hours. CWR spores can travel 1/4 mile under high humidity conditions or during a rainstorm. CWR can also be spread to uninfected plants on contaminated soil, litter, dead leaves, gardening equipment, clothes, shoes and hands. Infectious spores can live for up to eight weeks on contaminated objects.

The spread of the disease has been checked primarily by exclusion/quarantines. Cultural practices, survey, sanitation, and fungicides are employed to eradicate the disease. Infectious spores can only live for up to eight weeks, the disease cycle can be broken by a host free period of equal duration. Management of the humidity and water can also limit disease spread.

### 5.2.9 EUROPEAN LARCH CANKER – *LACHNELLULA WILLKOMMII*

**Quarantine** - Federal Domestic (CFR 301.91)

**Type of Pest - Fungus**

**Hosts** - All species of the genera *Larix* (larch) and *Pseudolarix* (false larch).

**Symptoms** - Slow growing twigs and branches are girdled and killed outright. In larger branches, where the growth of the host exceeds or keeps up with that of the fungus, the ensuing contest for mastery gives rise to the formation of large conspicuous cankers, ending in the killing of the affected part or, in rare cases, the defeat of the fungus. In any case the old cankers remain and render the affected parts of the tree commercially valueless. The fruiting bodies of the fungus may appear growing from the bark of infected trees. They appear to the naked eye as small saucer shaped structures with an orange-yellow center surrounded by a slightly incurved white rim. In damp weather, the disks open widely, conspicuously showing the orange center. In dry weather, they curl up and then appear as small whitish spheres.

**Inspection for European Larch Canker** - Examine both live and dead branches for the presence of the fruiting bodies as described above. Look for cankers and any other unnatural growth patterns. Specimens showing these cankers should be submitted to CDFA Plant Pathology Lab for identification.

### 5.2.10 KARNAL BUNT – *TILLETIA INDICA*

**Quarantine**

- Federal Domestic (CFR 301.89)
- Federal Foreign (CFR 319.59)

**Type of Pest - Fungus**

**Hosts** - Wheat, durum wheat and triticale (a hybrid of wheat and rye).

**Symptoms** - Karnal bunt infects host plants during flowering and heading. Symptoms become visible as the grain matures. In severe infection, bunted kernels are more noticeable because of the slight swelling, discoloration, and/or the absence of glumes. Milder infections are not usually visible in the field because only a few florets per head are infected. However, they may be detected at harvest when broken and partially bunted kernels appear in threshed grain. Also, a foul, fishy odor may be detected because of the release of trimethylamine gas by the Karnal bunt teliospores. Visible grain symptoms vary according to the severity of infection. Only when infection is high and the seed is severely bunted can visual observations detect Karnal bunt in the field. The usual symptom, a partially bunted kernel, is not readily apparent in the field. The only reliable way to detect Karnal bunt is through testing of harvested wheat.

**Transmission** - Infection is spread by spores and occurs during the flowering stage of the plant, when the developing ovary of a host plant comes in contact with infectious sporidia. The ideal conditions for infection are cool weather and rainfall or high humidity. In soil, the spores may be able to survive as long as five years. The spores can be carried on a variety of surfaces: plants, plant parts, seeds, soil, elevators, buildings, farm equipment, tools, and even vehicles. Spores and the sporidia are fragile and may be able to move only short distances.

**Control** - All crops in infested fields would be destroyed to eliminate Karnal bunt. The property may be treated to kill any remaining spores. Following treatment, grains(s) infected with Karnal bunt would be used only for nonpropagative

purposes or would be destroyed. Host crop(s) would not be planted on any contaminated field for a period of five years from the time of infection.

**Inspection for Karnal bunt** - Inspectors should look for bunted kernels that are fragile, dark in color, and fishy smelling. The kernel usually remains whole, although part of the germ may be eroded. Cracks in the surface reveal a black powdery spore mass within the endosperm at the embryo end of the kernel or along the kernel groove.

#### 5.2.11 OAK WILT – *CERATOCYSTIS FAGACEARUM*

**Quarantine** - State Exterior (CCR 3251)

**Type of Pest - Fungus (Fungi imperfecti)**

**Host** - All species of oaks (*Quercus* spp.) appear to be susceptible. Also chestnut, *Castania* spp., Chinquapin, *Castanopsis* spp., tan bark oak, *Lithocarpus*.

**Symptoms** - At the onset of the disease there is a slight crinkling and paling of the leaves followed by progressive wilting, bronzing, and browning of leaf blades from the margins toward the midrib. The red oaks display premature defoliation very strikingly and usually succumb to the disease within one to two months. White oaks and bur oaks may persist for several years, with affected branches dying back and producing a staghead effect. The leaves tend to remain on the dead branches differing from the effect on red oaks. There is often a brown streaking in the sapwood of the white and bur group. In the red oaks there is sometimes a brown to black discoloration of the outer annual rings. All or part of the above symptoms may be due to other causes. Proper identification of the causal fungus is necessary.

**Transmission** - The disease has been known to "jump" distances in excess of one mile. How this occurs is not well known, but woodpeckers, sapsuckers, various insects, and rodents are suspected as being possible vectors. Usually the disease travels from infected trees to adjacent trees producing circular patterns radiating from the original infected tree. In this type of transmission the disease is spread through root grafts.

**Control** - Removal of infected trees and trenching around the infected areas has been a fairly successful means of controlling local spread. Immediate removal of healthy trees appears to be a better method, especially if the stumps and larger roots as well as all brush are grubbed out and burned. The goal is establishing a buffer to save other healthy trees.

**Inspection for Oak Wilt** - The alteration of color and dying of the leaves followed by wilt, and the absence or presence of defoliation, coupled with discoloration and streaking in the sapwood or outer annual ring, indicates the possibility of oak wilt and the advisability of further examination by laboratory methods.

#### 5.2.12 OZONIUM ROOT ROT – *PHYMATOTRICHUM OMNIVORUM*

**Quarantines**

- State Interior (CCR 3401)
- State Exterior (CCR 3261)

**Type of Pest - Fungus**

**Hosts** - Over 1,700 species of plants, including cotton and many other root crops.

**Symptoms** - This disease is more easily discovered in the field than on individual plants. Infected fields often show large circular spots of infestation. The conidial stage develops on the ground near the outer margin of a zone of infected plants.

It had the appearance of a yellow, cushion like mass in this stage, usually becoming apparent only after the plants are wilting or dying. On individual plants, the entire root system is decayed, and the plants slip put of the soil without any effort of pulling. The infected areas enlarge year after year.

**Transmission** - Ozonium root rot can easily spread by the movement of farm and construction machinery and associated infected soil. Movement of infected plants may also spread the disease. Inspection for Ozonium Root Rot - Affected plants show fine brownish strands of fungus threads (rhizomorphs) that sparsely cover the roots. On larger roots, there are often numerous small cushion-like sclerotia or resting bodies, which are about the size of a pinhead.

### 5.2.13 LETHAL YELLOWING OF PALM

**Quarantine** - State Exterior (3282)

**Type of Pest - Mycoplasmalike Organism. (MLO)**

**Host** - About twenty-six palm species, including date, coconut, and fan palms.

**Symptoms** - The first observable sign of the disease is fruit drop, then inflorescence necrosis, foliar yellowing and desiccation, root degeneration, spear leaf necrosis, and rapid death.

**Transmission** - Presumably the disease agent is insect vectored, possibly by a plant hopper (*Myndus crudus*).

**Control** - Prevent or delay entry by regulatory measures. Restrict new plantings to resistant species and varieties; remove diseased palms.

**Inspection for Lethal Yellowing of Palm** - Best time to detect the disease is when flowers or fruit are present. Leaf symptoms are visible in any season.

### 5.2.14 LITTLE PEACH

**Quarantine** - State Exterior (CCR 3259)

**Type of Pest - Mycoplasmalike Organism (MLO)**

**Host** - Peach, nectarine, apricot, almond, plum, and prune. Some varieties of plum are known to be symptomless carriers.

**Symptoms** - On young seedlings peach trees there is a distortion of young terminal leaves on affected branches often accompanied by an excessive number of short branches along the main stem. These short branches are more upright than those produced by normal growth. There is also a shortening of the internodes and a general stunting of the tree. Newly infected trees are generally deeper green in color than unaffected plants. As the disease becomes chronic the mature leaves become slightly yellow with twiggy growth along the branches. The branches become compact and bushy with leathery, curled, dark green leaves, which become lighter as the disease progresses. On older trees, the disease may be confined to only one or a few branches of the tree. The fruit of affected branches is smaller and ripens several days to three weeks prematurely, and has an insipid flavor. The pits are reduced in size, and the kernels are either undeveloped or fail to germinate.

**Inspection for Little Peach** - Positive identification of the disease on dormant plants is difficult. During the growing season compact, bushy appearance, upright habit of the branches and leathery curled leaves are perhaps the most obvious indications of the disease.

### 5.2.15 PEACH ROSETTE

**Quarantine** - State Exterior (CCR 3259)

**Type of Pest - Mycoplasma-like Organism (MLO)**

**Hosts** - Peach, apricot, almond, plum, nectarine, mazzard, sour and sand cherry.

**Symptoms** - The first leaves formed are normal in size, but commonly fold inward or arch backward and usually turn a yellowish color with red spots. The leaves usually fall prematurely, dropping in early summer. As the new terminal growth has very short internodes, the newly formed leaves are closely expressed into distinct rosettes. The older leaves are progressively shed, leaving only tufts of younger leaves at the tips of naked twigs. Trees of fruit bearing age usually produce blossoms but they do not mature into fruit. Most affected peach trees die the same year the symptoms appear. The symptoms on other hosts are usually less intense.

**Inspection for Peach Rosette** - Only after the diseased plant has leaves can this disease be determined. The tufts or rosettes at the tips of branches are the most distinguishable symptoms.

### 5.2.16 PEACH YELLOWS

**Quarantine** - State Exterior (CCR 3259)

**Type of Pest - Mycoplasma-like Organism**

**Hosts** - Peach, nectarine, apricot, and plum are the primary hosts, however no species of the genus *Prunus* is known to be immune.

**Symptoms** - On peach, fruits ripen a few days to three weeks premature; has a bitter flavor and is of inferior quality. In varieties that normally are red skinned and red-colored around the pit, the skin is abnormally high colored and spotted with purple, while the flesh is streaked and marbled with crimson. The leaves are chlorotic yellow, and tend to roll and drop downward. Shoots are upright, thin, willowy, and bear small, narrow yellow leaves. Leaf buds unfold prematurely into yellowish leaves, about an inch in length, giving the tree a bushy appearance. Trees usually die 2 to 6 years after infection, except in milder strains in which the tree life may be prolonged. The symptoms are similar in appearance and severity on apricot, almond, American and hortulan plums, David peach, almond cherry and Manchu cherry. The effect on other hosts the effect is milder or lacking.

**Transmission** - The plum leafhopper, *Macropsis trimaculata*, is the only known insect vector. Infected budwood will carry the pathogen to healthy plants.

**Inspection for Peach Yellows** - The production of slender, upright growing shoots is perhaps the best diagnostic character. Fruit and foliar symptoms are not present during the bareroot season.

### 5.2.17 RED SUTURE

**Quarantines** - State Exterior (CCR 3259)

**Type of Pest - Mycoplasma-like Organism**

**Hosts** - Peach and Japanese plum; *Prunus salicina*

**Symptoms** - Symptoms are found on both peach fruit and foliage. Fruits ripen several days prematurely, particularly on the suture side. The suture side may be swollen or bulged and flavor is usually insipid. A diseased tree presents a yellowish-green to greenish-bronze appearance, and usually takes an autumn-like coloration prematurely. A tree will develop a less dense interior than normal after several years. A diseased tree may live for 8 years or more. The symptoms on plum are indistinguishable from those caused by peach yellows.

**Transmission** - Probably through infected budwood.

#### 5.2.18 BROOMING DISEASE OF WALNUTS

**Quarantines** - State Exterior (CCR 3260)

**Type of Pest - Virus**

**Hosts** - Black walnut, *Juglans nigra*; butternut, *J. cinerea*; and Japanese walnut, *J. cordiformis* var. *ailantifolia*.

**Symptoms** - This disease is characterized by development of brooms or sucker growth on the main stem and branches. There is also a tufting of terminals, a profusion of branchlets from axillary buds, a dwarfing of the leaves, and occasionally death of the tree. The severity of the disease is quite variable.

**Transmission** - A treehopper, *Euchenopa binothea*, is suspected of being the vector.

**Control** - Removal of infected trees when found and rigid quarantine laws restricting movement of host material into uninfected areas is the best method of control.

**Inspection for Brooming Disease of Walnuts** - In bare root season, the profuse branchlets from axillary buds are a possible indication. In the field, all the aforementioned symptoms should be checked during the growing season.

#### 5.2.19 CITRUS TRISTEZA VIRUS (RAPID DECLINE) – CLOSTEROVIRUS CITRUS TRISTEZA VIRUS

**Quarantine** - State Interior (CCR 3407)

**Type of Pest – Virus**

**Hosts** - *Citrus* sp.

**Classical Symptoms** - The first symptoms of the disease in sweet orange grown on sour orange rootstock are the bronze to ashen color of the dull foliage and the absence of new foliage. As the disease progresses, the leaves tend to curl lengthwise and upward, followed by leaf fall, death of fibrous roots, wilting and dying of leaves, and disappearance of starch in affected roots and trunks. Affected trees may undergo complete collapse in one to several weeks or may reach a state of equilibrium with the disease and linger an indefinite period of time in a weakened condition. Trees of sour-sweet combination affected with this disease resemble 'gophered' trees. Other combinations of top and scion and seedlings show little or no evidence of the disease except for occasional stem-pitting, reduced vigor and growth, and in Mexican limes, there is a flecking and vein clearing on the leaves.

**ELISA Testing** - When sour orange was a common rootstock in California, tristeza caused the rapid death of infected trees. Most trees today are grown on resistant rootstocks that show no symptoms of the disease when infected with common strains of the virus. Nevertheless, such trees act as a reservoir to infect other trees. The cotton or melon aphid is the common vector but is not very effective in transmitting the disease. The brown citrus aphid, *Toxoptera citricida*, is a much more effective vector but isn't yet found in California. Mild strains can mutate to more deadly strains during transmission and this is a cause of great concern in California. In order to protect the citrus industry, surveys are conducted throughout the major production areas. The production and movement of citrus nursery stock is highly regulated. Currently, ELISA test which uses an antisera and an index of Mexican lime indicator trees are used to test for Citrus tristeza.

**Inspection for Tristeza** - Observe trees for top symptoms, e.g., ashen-bronze color, absence of new growth, etc. If possible, the nature of root stock. Check for gopher injury. Old injury from gophers usually produces adventitious roots above point of injury. If gophers can be eliminated as the causal agent, a section of the bark should be removed at the bud union and a section of the wood scraped or chiseled away. Then an aqueous solution of Tincture of Iodine applied to the wood. Typical symptoms will be a purplish-blue color above the point of union indicating starch with no colored fibrous roots. The cortex of the fibers should slough off often leaving only the stele. Another indication of the disease is the absence of starch in the roots.

### 5.2.20 PEACH MOSAIC

**Quarantine** - Effective July 10, 2015, regulatory quarantine enforcement has ceased

**Type of Pest - Virus (*Marmor persicae*)**

**Host** - All varieties of peach, plum, prunes, nectarine, apricot, and almond (J.H. Hale, Filberta, Rio Oso Gem, and other of similar heritage are the most severely affected).

**Symptoms** - The expressions of this disease vary considerably according to the virulence of the particular form of virus, variety, season, care of the trees, and length of time the tree has been infected. There are five important symptoms:

1. Color breaking in flowers. Affected flowers may be crinkled and sometimes dwarfed.
2. Retardation of leaf growth, especially in the spring.
3. Yellow mottling of leaves, most noticeable in the spring, which vary in size and form from pointlike flecks to irregular spots, blotches, and streaks. In virulent forms, the early leaves may be severely affected with mottle and deformity; and may wither and fall while later leaves remain on the tree, but are more or less dwarfed, irregular in shape, and mottled. Leaves on trees less severely affected commonly exhibit mottling, but little or no deformity. After the first year, the leaf symptoms tend to become less severe.
4. Fruit symptoms appear when the green fruit is about an inch in diameter or when the stone is hardening and are bumpy deformities often with irregular ridges or round raised areas surrounded by depressions, especially along the suture. The fruits grow slower and ripen sooner than normal. Fruit symptoms do not usually appear in tolerant hosts or mild virus strains.
5. Twig symptoms - On severe twigs may be dwarfed and spur-like because of shortening of internodes.

**Transmission** - By very small, obscure eriophyid mites.

### 5.2.21 APPLE MAGGOT – *RHAGOLETIS POMONELLA*

**County Ordinance**

**Type of Pest - Insect, Order - Diptera (Flies).**

**Host** - Apples, hawthorns, wild crab apples, blueberries and to some extent huckleberries, plums, and cherries.

**Nature of Injury** - The apple maggot, or railroad worm, causes brown tunnels or burrows inside the apple. After an infested apple has fallen or is picked from the tree, the flesh usually breaks down and becomes a brownish, pulpy mass. Early maturing fruit are most severely injured.

**Life Cycle** - The flies lay their eggs in the flesh of apples, preferably sweet and sub-acid varieties that ripen during the summer or fall. The legless larva, is white to yellowish with no distinct head, develops in the fruit and passes the winter in the pupal stage in the soil. Adult flies emerge over a period of a month or two in the summer. Adults are black in color, a little smaller than houseflies, with 3-4 white bands on the abdomen. The wings have four oblique black bands.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	In the fruit	Spring and summer
<b>Larvae</b>	In the fruit	Summer and fall
<b>Pupae</b>	2" to 6" in soil	All year
<b>Adult</b>	Area of fruit	Summer

**Overwinter** - Puparium in soil.

**Likely Way of Introduction/Interception** - Larvae in infested fruits.

**Generations Per Year** - One to two.

### 5.2.22 ASIAN LONGHORN BEETLE – *ANOPILOPHORA GLABRIPENNIS*

**Quarantines** - Federal Domestic (CFR 301.51)

**Type of Pest - Insect**

Order - Coleoptera

**Host** - *Acer* (maple), *Aesculus* (horse chestnut), *Malus* (apple), *Melia* (chinaberry), *Morus* (mulberry), *Populus* (poplar), *Prunus* (cherry), *Pyrus* (pear), *Robinia* (locust), *Salix* (willow), *Ulmus* (elm) and *Citrus*.

**Nature of Injury** - After hatching, the first instar larva feed in the phloem and the fourth instar feeds in the xylem. Adults emerge from the tree by boring about three-eighths inch hole through the bark.

**Life Cycle** - Adults prefer to lay eggs in stressed trees. Females lay their eggs in grooves on the branches where new shoots emerge. Larvae hatch and feed in the phloem and xylem. Adults emerge in late spring through summer. Heavy sap flow occurs from wounds in trees infested with Asian Longhorns. Heavy sawdust debris is also found around the base of infested trees.

**Description** – Eggs are off-white, 5-7 mm in length. Larvae: about 50 mm at maturity, grubs are yellow/cream color with a dark colored head. Pupae: off-white, about 30 mm long and 11 mm wide. Adult: 20-35 mm long and 7-12 mm wide. The beetle is black with white dots over the abdomen. Antennae have a black and white pattern. Male antennae are about 2.5 times of its body length and female is 1.3 times body length.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	Branches/crescent shaped cut in tree surface	Spring
<b>Larvae</b>	Immature or possible stick-tight barks	Spring to Fall

<b>Pupae</b>	Soil	Summer to Fall
<b>Adult</b>	Around host and orchard trash	All year

**Overwinter** - Adult Beetles.

**Likely Way of Introduction** - Egg and larval stage.

**Generations** - One to two.

### 5.2.23 BLACK WALNUT CURCULIO – *CONOTRACHELUS RETENTUS*

**Quarantine** - State Exterior (CCR 3273)

**Type of Pest - Insect**

**Order** - Coleoptera (Beetles)

**Host** - Walnuts

**Nature of Injury** - Adults feed on young shoots in the spring, puncturing young fruit with their beaks for use as an egg depository. The larvae burrow through the nuts.

**Life Cycle** - Curculios hibernate as adults, feeding on young shoots in the spring and making crescent shaped cuts for their eggs in very young walnuts, which drop to the ground half grown. Pupation is in the soil. Adult beetles emerge in the fall.

**Description** – Egg: whitish. Larvae: dirty white with brown head, legless. Pupae: dirty white. Adult: pale reddish, covered with grayish pubescence or hairy growth.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	In crescent shaped cut in nut surface	Spring
<b>Larvae</b>	Immature nut or possible stick-tight nut	Spring to Fall
<b>Pupae</b>	Soil	Summer to Fall
<b>Adult</b>	Around host and orchard trash	All year

**Overwinter** - Adult beetles.

**Likely Way of Introduction** - Egg and larval stages.

**Generations** - One to two.

### 5.2.24 DIAPREPES ROOT WEEVIL – *DIAPREPES ABBREVIATUS*

**Quarantine**

- State Exterior (CCR 3279) - **REPEALED**
- State Interior (CCR 3433) - **REPEALED**

**Type of Pest - Insect**

**Order** - Coleoptera (Beetles)

**Hosts** - More 270 plant species from 59 plant families including: citrus (all varieties), vegetables, ornamental nursery stock, corn, strawberry, sugarcane, sweet potato, pepper, cotton etc.

**Nature of Injury** - Adults feed along the edges of leaves causing notches. Younger leaves are preferred but may feed on fruits especially citrus and papaya. Larvae feed on roots, tubers, or other underground portions causing extensive damages to their host plants.

**Life Cycle** - Eggs are laid in clusters of 30 to 265 and placed between two leaves or inside the folded edge of leaf glued together by gelatinous substance produced by female weevils. Eggs are white, oval shaped and about 0.04-inch (1 mm) length and hatch in 7 to 10 days. Larvae: leave the cluster, drop from the leaves to the soil surface. Larvae then enter the soil and search for and feed on plant roots. Larvae are creamy-white, complete about 10 to 11 instars over an 8 to 15 month period and attain a length of about 1inch. Pupae: are light-red and occur in pupal chamber in the soil for 15 to 30 days. Adults: emerge from the soil and are capable of strong flights for only short duration and distances from where they emerge. Rainfall/ irrigation promotes emergence. Adults are large, colorful, 3/8 to 3/4 inch (10 to 19 mm) long, with numerous forms, ranging from gray to yellow to orange and black. The complete life cycle varies from 5 to 18 months depending on nutritional and environmental factors.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	In clusters between or inside folded leaves	Varies
<b>Larvae</b>	Soil	Varies
<b>Pupae</b>	Soil	Varies
<b>Adult</b>	Host	Varies

### 5.2.25 BLUEBERRY MAGGOT – *RHAGOLETIS MENDAX*

**Quarantine** - State Exterior (CCR 3266)

**Type of Pest** - Insect, Order - Diptera (Flies)

**Hosts** - Blueberries and Huckleberries are the only known hosts.

**Nature of Injury** - Blueberry maggot burrows inside of the host fruit causing the flesh to break down and become brownish. It is rarely possible to detect the presence of Blueberry maggot larvae from the outside of the fruit. However, close examination will reveal presence of ovipositor stings left behind by females while laying eggs into the fruit.

**Life Cycle** - Egg: found in fruit; white to yellow in color; about 0.7 mm to 0.9 mm in length. Adult female may lay up to 400 eggs, which hatch after a two to ten day incubation period. Larvae: elongated cream colored maggots, about 7 mm long, with a blunt posterior, which tapers toward the anterior end where the black mouth hooks, may be found. They have no distinct head and usually last 20-30 days. Pupae: Pale yellowish-brown and somewhat barrel-shaped, about 5 mm in length; may be found in the fruit, or at the bottom of boxes; but generally found in the soil below host trees. Adult: black fly having four oblique black bands on the transparent wings; head is orange and legs are yellow in color; three to four white bands may be found on the abdomen.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	In the fruit	Spring and Summer
<b>Larvae</b>	In the fruit	Summer and Fall

<b>Pupae</b>	2" to 6" in soil	All year
<b>Adult</b>	Area of fruit	Spring and Summer

**Overwinter** - Pupa in soil.

**Likely Way of Introduction** - Eggs and Larvae in infested fruit.

**Generations Per Year** - Generally one, but in warmer climates, there may be two.

### 5.2.26 BOLL WEEVIL – *ANTHONOMUS GRANDIS*

**Quarantine** - State Exterior (CCR 3254)

**Type of Pest - Insect**, Order - Coleoptera (Beetles).

**Host** - Cotton, but adults are known to feed on okra, and hollyhock.

**Nature of Injury** - Leaf-like bracts at base of squares punctured by boll weevils during feeding, open up or flare and squares turn yellow and die. Most of the punctured bolls are not shed. The lock in which a grub feeds fails to develop properly and lint is cut, stained brown and decayed.

**Life Cycle** - Boll weevils pass winter as adults in woodpiles, trash, and other protected places. Boll weevils prefer to feed on and lay eggs in squares. Eggs are laid singly in deep punctures within the squares or bolls. Eggs hatch into white larvae or grubs in 3 to 5 days. Grubs feed seven to 14 days within the squares or bolls, and pupate in the cavity formed by their feeding. Adults emerge from pupal stage in three to five days and cut their way out of the squares. After feeding on blooms, squares or bolls for three to four days the females mate and start laying eggs. The cycle from egg to adult weevil is about three weeks.

**Description** - Egg: laid in bolls\* and squares\*\* only. Larvae: legless grub, with a curved body, and wrinkled brown head and mouthparts. Pupae: found in squares only. Adults: are small hard-shelled weevil. The most characteristic feature about the boll weevil is the two spurs, or teeth, near the end of its front femur; the inner tooth much longer than the other tooth, and a single tooth on the middle femur.

\*Pod containing cotton and seed.

\*\*Flower parts before blooming

<b>Stage</b>	<b>Place</b>	<b>Time</b>
<b>Egg</b>	Squares or bolls	Spring to Fall
<b>Larvae</b>	Squares or bolls	Spring to Fall
<b>Pupae</b>	Squares or bolls	Spring to Fall
<b>Adult</b>	Plant parts and debris	All year

**Overwinter** - Adults.

**Likely Way of Introduction** - Cotton and cotton plants, all stages.

**Generations** - Up to seven a year.

### 5.2.27 BUTTERNUT CURCULIO – *CONOTRACHELUS JUGLANDIS*

**Quarantine** - State Exterior (CCR 3273)

**Type of Pest** - Insect, Order - Coleoptera (Beetles)

**Hosts** - Butternuts and English walnuts.

**Nature of Injury** - Adults make punctures in nuts, tender tips, and leaf petioles. Larvae burrow through the nut or down the twig.

**Life Cycle** - Beetles overwinter in the adult stage. Adults attack leaf tips, leaf petioles and nuts. Eggs are laid in crescent-shaped punctures in young nuts. Newly hatched larvae burrow through the nut or down the twig. When the larvae are full-grown they go below the soil surface to pupate. Adult beetles emerge in the fall and feed before seeking winter shelter.

**Description** - Egg: whitish. Larvae: dirty white with brown heads. Pupae: dirty white. Adults: are brownish gray resembling plum curculio but with white markings 1/4" long.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	In crescent-shaped cuts in nut surface	Spring
<b>Larvae</b>	In immature or stick tight nut	Spring to Fall
<b>Pupae</b>	Soil	Summer to Fall
<b>Adult</b>	About hosts and orchard trash	All year

**Overwinter** - Adult beetle.

**Likely Way of Introduction** - Egg and larval stage.

**Generations** - One to two.

### 5.2.28 CARIBBEAN FRUIT FLY – ANASTREPHA SUSPensa

**Quarantines** - State Exterior (CCR 3252)

**Type of Pest** - Insect, Order - Diptera (Flies)

**Host** - Over 80 species of tropical and subtropical fruits, including: citrus, guava, kumquat, loquat, mango, papaya, and peach.

**Nature of Injury** - Larvae feeding causes breakdown of fruit tissues. Ovipositor punctures admit decay organisms that may cause tissue breakdown. Premature fruit drop is common.

**Life Cycle** - Eggs are deposited singly and hatch in two to three days if conditions are ideal. The larvae feed within the pulp of maturing and mature fruit. Pupation usually occurs in the soil but could occur in fruit.

Egg: spindle-shaped, glossy, about 1 mm. long. Larvae: a cream-colored maggot with no distinct head on larva. Pupae: creamy-yellow to reddish-brown puparium which may exceed 7 mm long and is about 4 mm. in wide. Adult: yellowish-brown and 1-1/2 to 2 times the size of the common housefly, black posterior spot on thorax, wing bands are yellow-brown to brown.

**Overwinter** - Usually as a puparium in the soil.

**Likely Way of Introduction** - Eggs and larvae in fruit.

**Generations** - Dependent upon temperature and other environmental factors.

**5.2.29 CEREAL LEAF BEETLE – OULEMA MELANOPA**

**Quarantine** - State Exterior (CCR 3277) - **REPEALED**

**Type of Pest** – Insect, Order - Coleoptera (Beetle)

**Hosts** - Grass family, preferring small grains, especially oats and barley.

**Nature of Injury** - Both adults and larvae damage grain crops. Adult beetles cut longitudinal slits between the veins and may kill the plant. Most damage is done in the larval stage. In Europe crop loss to the cereal leaf beetle has been reported to be as high as 25 to 50 percent.

**Life Cycle** - The beetle has four stages and produces one generation per year. Adult beetles overwinter, usually in clusters, wherever they can find shelter - under loose bark of trees, in old corn stalk and leaves, cracks of fence posts or ground. They are found in greatest number in hedgerows or trees and stump borders surrounding cultivated fields. Adults emerge early in spring and first attack wild grasses near their hibernation spots. The adults are strong fliers and have been collected as high as 1,000 feet above ground. Spring feeding before laying eggs, normally lasts about two weeks. Eggs are laid on the upper surface of the host plant leaves. In warm weathers, eggs hatch in five days and the larvae develop in the next ten days. When full grown the larvae leave the plants and pupate in earthen cells in the top two inches of soil.

**Description** - Egg: elliptical, yellow, and smaller than pinhead (less than 1/16 inch), turns almost black before hatching, deposited singly or in rows on leaves of host plant. Larvae: are small slug-like in appearance, ¼ inch long having a yellowish body and brownish colored head and legs. Pupae: yellowish-brown, turning bluish-black before adult emerges. Adult: hard-shelled beetle 3/16-inch long. Its wing covers and head are metallic bluish-black, legs and front segment of its thorax are reddish-orange.

<b>Stage</b>	<b>Place</b>	<b>Time</b>
<b>Egg</b>	*Upper surface on leaf	Early Spring
<b>Larvae</b>	Leaves of host plants	Spring
<b>Pupae</b>	Soil	Late Spring, Early Summer
<b>Adult</b>	Leaves of host plants	**Early Spring, Midsummer and Winter

**Overwinter** - Adults.

\*On corn, eggs are found on lower surface of leaf

\*\*Early spring adults and overwintering adults.

**5.2.30 CHERRY FRUIT FLIES**

**Western Cherry Fruit Fly** - *Rhagoletis indifferens*

**Black Cherry Fruit Fly** - *Rhagoletis fausta*

**Quarantines**

- State Interior (CCR 3414)
- State Exterior (CCR 3256)

**Type of Pest** – Insect, Order - Diptera (Flies)

**Hosts** - Cherry, wild cherry, pears, and plum. Black Cherry fruit fly prefers sour cherry to sweet cherry.

**Nature of Injury** - Adult flies feed by scraping surface of leaves/fruits and sucking liquid plant juices. The larvae feed inside the fruit producing misshapen, undersized cherries with one side shrunken or decayed and some turning red before maturity.

**Life Cycle** - Winter is passed as a pupa in the soil. Adult flies emerge during late spring. Females lay their eggs through small slits cut in the flesh of the fruit. Full-grown larva, drop to the ground and work its way below the surface where they change into the pupae in the soil. It passes the winter in the pupae stage.

**Description** - Larvae: yellowish-white legless maggots, pointed at the head, will be found in flesh of fruit. Pupae: are brown capsule-like case in the soil. Adult: are yellow margins on the thorax. White-banded Cherry Fruit Fly has four white cross bands on the abdomen. Both have blackish bands on the wings.

Stage	Place	Time
Egg	In pulp of fruit	May and June
Larvae	In pulp of fruit 12 to 21 days	June
Pupae	Soil	10 months of Year
Adult	Flying around host	June and July

**Overwinter** - Pupae in soil.

**Likely Way of Introduction** - Eggs and larvae in infested fruit.

**Generations Per Year** - One.

### 5.2.31 COLORADO POTATO BEETLE – *LEPTINOTARSA DECEMLINEATA*

**Quarantine** - State Exterior (CCR 3264)

**Type of Pest** - Insect, Order - Coleoptera (Beetle)

**Hosts** - Potato is the preferred host. Other hosts include tomato, eggplant, tobacco, pepper, ground cherry, thorn apple, Jimson weed, henbane, horse nettle, belladonna, petunia, cabbage, thistle, mullein, etc.

**Nature of Injury** - Both adult beetle and larvae feed by chewing the leaves and terminal growth of the host plant especially potato. They can devour so much of a plant's above ground biomass that the plant dies. Consequently, development of tubers is prevented or the yield greatly reduced.

**Life Cycle** - Colorado potato beetle eggs are laid in bunches on the underside of the leaves. The eggs hatch in four to nine days. Larvae feed on host plant and grows rapidly, passing through four instar stages, which are similar in appearance except that each stage is larger than preceded one. The larvae become fully grown, in 10 to 21 days, drops to the ground and pupates in the soil. After five to ten days the adult beetle emerges from the pupa, crawls out of the ground, feed on plants for a few days and lay eggs for another generation.

**Description** - Egg: orange-yellow. Larvae: small, humpbacked, reddish in color with two rows of black spots on each side of the body. Pupae: are brownish. Adult: are yellow with five longitudinal black lines on each wing cover and with black spots on the thorax.

Stage	Place	Time
Egg	Underside of leaf	Spring through Summer
Larvae	Leaves and buds	Spring through Summer
Pupae	Soil	Summer
Adult	Hibernate in soil	Summer through Fall

**Overwinter** - Adult.

**Likely Way of Introduction** - All stages.

**Generations Per Year** - Average two.

### 5.2.32 CORNSTALK BORERS

**Southern Cornstalk Borer** - *Diatraea crambidoides*

**Southwestern Corn Borer** - *Diatraea grandiosella*

**Quarantine** - State Exterior (CCR 3272)

**Type of Pest** - Insect, Order - Lepidoptera (Butterflies and Moths)

**Hosts** - The primary host is corn. Sorghum, Johnson grass, broomcorn and sugarcane are also known to be attacked.

**Nature of Injury** - Larvae feeds on leaves, then bore into the stalk and damage the circulatory system of the host plant. This may cause severe twisting and stunting of the stalk and weakens it, sometimes to the point of toppling over.

#### Southern Cornstalk Borer (*Diatraea crambidoides*)

**Description** - Egg: the flattened, creamy-white or yellowish, oval eggs are laid in rows or clusters, in a shingle-like manner, generally on the lower surface of the leaf. Larvae: are dirty white or yellowish in color with a brownish head and thoracic shield. The larva is covered with spots, each having a short dark bristle originating from it. These spots are pale during the winter, but quite conspicuous during the summer. The larva reaches a length of about 25 mm when fully grown. Pupae: are brown and naked, about 20 mm in length. It is contained within the stalk in a silk lined tunnel created by the preceding larval stage. Adult: the adults of both species are quite similar and field separation should not be attempted. The females are approximately 20 mm in length, and of a dirty white to pale yellow in color. The males are slightly smaller and darker in color.

#### Southwestern Corn Borer (*Diatraea grandiosella*)

##### Life Cycle

Stage	Place	Time
Egg	Underside of the leaves	Spring through Summer
Larvae	In stalks	All year
Pupae	Inside stalk	Spring through Summer
Adult	Flying about host	Spring through Summer

**Overwinter** - Larvae in stalk.

**Likely Way of Introduction** - Larvae and pupae.

**Generations Per Year** - One to three.

### 5.2.33 EUROPEAN BROWN GARDEN SNAIL – *HELIX ASPERSA*

**Restrictions** - Other States

**Type of Pest** - Snail (Mollusk), Order - Eupulmonata

**Hosts** - Ivy, tomato, strawberry, avocado, citrus, myrtle, eucalyptus.

**Nature of Injury** - Presence of snails is usually indicated by 'slime trails, dried mucus. Snails are active at night or on cool, foggy days and feed on a variety of plants and decaying materials. They chew irregular holes in leaves and young plant bark. In mild-winter areas, like Southern California, they are active throughout most of the year.

**Breeding Habits** - Adults lay about 80 white, spherical eggs in small holes of topsoil. Females may lay eggs up to six times a year. It takes about two years for snails to reach maturity.

**Description** - Adult shell is about 1 ¼" in diameter. It is yellowish-brown, typically with four light to dark brown spiral bands frequently streaked with white. In hot weather, adults seal themselves off with a 'parchment-like' membrane and attach themselves to trees, fences, walls, etc.

**Likely Way of Introduction** - Adults, on host material.

### 5.2.34 EUROPEAN CORN BORER – *OSTRINIA NUBILALIS*

**Quarantines**

- State Exterior (CCR 3263)
- Federal Foreign (CFR 319.41)

**Type of Pest** - Insect, Order - Lepidoptera (Moths and Butterflies)

**Hosts** - Corn is the primary host. Broomcorn, sorghum and sudangrass are also major hosts. The pest has been found on 200 kinds of plants.

**Nature of Injury** - Stalks and tassels broken or bending over. Larvae feed on leaf blades and bore holes through stalks and cobs causing severe loss of crop.

**Life Cycle** - Eggs are laid overlapping one another like fish scales in masses of 15 to 20, or more, on the underside of the corn leaves and hatch in four to nine days. The tiny borers immediately crawl to protected places on the plants where they feed on immature leaves and tassels tissues. Eventually they bore into the stalks and ears. They mature in about a month, and after providing an exit for the adult moth, change to pupae inside the burrows. In 10 to 14 days, the adult moths emerge from the pupa cells and lay about 400 eggs. The moth lives from 10 to 24 days.

**Description** - Egg whitish. Larvae flesh colored with small, round, brown spots. Pupae brown and smooth. Adult female, pale yellowish-brown with irregular, darker bands running in wavy lines across the wings, male moth distinctly darker, having the wings heavily marked with olive brown.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	Underside of leaf	Summer - one week
<b>Larvae</b>	On stalk then inside stalks	August to May (10 months)

<b>Pupae</b>	In cob or stalk	Spring
<b>Adult</b>	Vicinity of corn	Summer

**Overwinter** - Larvae/caterpillar.

**Likely way of Introduction** - Larvae in host.

**Generations Per Year** - One to two.

### 5.2.35 EUROPEAN PINE SHOOT MOTH – *RHYACIONIA BUOLIANA*

**Quarantine** - State Exterior (CCR 3275)

**Type of Pest** - Insect, Order - Lepidoptera

**Hosts** - All species and varieties of pine trees with or without roots and branches or twigs bearing terminal buds, needles, or shoots.

**Nature of Injury** - Larva bores through the needle sheath and mines the base of the needles, then moves to a bud for feeding. Severe infestations will cause the tree to die.

**Life Cycle** - Larva hibernates in the bud or under a moss of pitch on the bud. In the spring the larva emerges and starts to feed. In late May or early June larva pupates and two or three weeks later pupa emerges as an adult moth. Moths usually mate within 24 hours and females begin laying eggs from time of mating through the month of July. Eggs are deposited on twigs, buds, and needles. Eggs hatch within a week or two; larvae then feed and grow until time for hibernation.

**Description** - Eggs are small dish shaped and yellow, later turning orange then reddish-brown. Full-grown larvae are about 5/8-inches long. Pupae – reddish brown and about 3/8-inches long.

<b>Stage</b>	<b>Place</b>	<b>Time</b>
<b>Egg</b>	Twigs, buds, and needles	June and July
<b>Larvae</b>	Twigs, buds, and needles	July through May
<b>Pupae</b>	In buds	May and June
<b>Adult</b>	On trees	June and July

**Overwintering Stage** - Larvae.

**Most Likely Means of Introduction** - Larvae.

**Generations Per Year** - One.

### 5.2.36 GRAPE PHYLLOXERA – *PHYLLOXERA VITIFOLIAE*

**County Restriction**

**Type of Pest** - Insect, Order - Homoptera (aphids, scales, whiteflies)

**Hosts** - Grapevines and cuttings, rooted or otherwise. Used equipment.

**Nature of Injury** - Causes galls on grape roots and leads to the slow death of the vine by constricting absorption of nutrients and water. Breakdown of roots is also hastened by the presence of fungi, and molds.

**Life Cycle** - Overwinter on roots as small nymphs. In spring these nymphs feed and mature. Adult females deposit eggs by asexual reproduction, giving rise to several generations throughout the summer and fall. At the end of September some of the crawlers begin to hibernate.

**Description** - Adults are similar in appearance to an aphid, 1 mm, oval body shape, yellowish green or brown body with six distinct rows of dark spots on the dorsal and lateral sides. Eggs are initially golden yellow turning green later; oval; length 0.3 mm. Nymph referred to as crawlers because they can move freely.

Stage	Place	Time
Egg	Soil	Spring
Larvae	Roots	Winter
Pupae	Roots	Spring - Fall

**Overwintering Stage** - Nymph stage in temperatures below 60°F and all stages at temperatures above 60°F.

**Most Likely Means of Introduction** - All stages on nursery stock.

**Generations Per Year** - 5 to 8.

### 5.2.37 GYPSY MOTH – *LYMANTRIA DISPAR*

**Quarantines** - Federal Domestic (CFR 301.45)

**Type of Pest** - Insect, Order - Lepidoptera (Moths and Butterflies)

**There are two main types of the moth** - Asian and European/North American. Dispersal pattern is the main difference between types of the gypsy moth. Adult females of Asian GM have longer and stronger wings that allow for flight whereas females of European/North American GM are flightless.

**Hosts** - Nearly all deciduous and evergreen trees and shrubs are hosts. It attacks garden plants and is a serious pest of cranberries. The larva is known to feed on over 500 different species of plants. In addition to plant hosts, Outdoor Household Articles (OHA) such as lawn furniture, barbeque equipment, firewood and even recreational vehicles can harbor gypsy moth. Females lay eggs on almost any surface.

**Nature of Injury** - The larvae eat the leaves and associated defoliation retards the growth and otherwise weakens the trees. Repeated complete defoliation may kill the trees.

**Life Cycle** - Winter is passed in the egg stage. The eggs are laid in masses up to an inch long and averaging about 400 eggs. They are covered with hair. Gypsy moth larvae usually appear about May. They mature in late June or early July and seek shady places to pupate, such as trees or rocks. The moths emerge about a month later. Males are strong daytime fliers, but the females are heavy bodied and cannot fly. They lay their eggs close to the place where they emerge as adult moths.

**Description** - Egg light brown masses covered with a hair coating (similar to Fruit Tree Leaf Roller eggs). Larvae are brown and hairy with five pairs of blue tubercles along the back and followed by six pairs of red tubercles. Adult male, dark brown in color; female, light buff color with irregular dark markings across.

Stage	Place	Time
Egg	Trees, stones, posts, etc.	July to May
Larvae	Foliage of food plant	May to July

<b>Pupae</b>	Sheltered places first	2 to 3 weeks in July
<b>Adult</b>	Male - Fly about host	July to September

**Overwinter** - Egg mass.

**Likely Way of Introduction** - Egg which occurs nine months of the year and is deposited on material likely to be transported.

**Generations Per Year** - One.

### 5.2.38 HICKORY SHUCKWORM – *CYDIA (=LASPEYRESIA) CARYANA*

**Quarantine** - State Exterior (CCR 3273)

**Type of Pest - Insect**, Order - Lepidoptera (Moths and Butterflies)

**Hosts** - Pecan and Hickory nuts.

**Nature of Injury** - Mining and tunneling, by the larvae, in the green shucks surrounding the nut, often resulting in the improper development of the nut kernels and prevents clean separation of the shucks from the nut. Larvae may also feed on the interior of green nuts prior to the hardening of the shell, causing further reduction of the crop.

**Description** - Egg small, oval whitish in color; laid on exterior of maturing nut; hatches in 4 to 5 days. Larvae typical moth larva, having both pro-legs and three pairs of true legs; creamy-white in color with a brownish head; growing to a length of 10 to 12 mm at maturity. Pupae golden-brown in color about 10 mm in length. Adult about 12 mm in length, with a wingspan of 15 to 20 mm; dark brown to smoky black in color, seeming iridescent blue or purple in certain light. Short yellow streaks appear on the leading edge of the front wings.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	Exterior surface of nuts	Mid-Summer
<b>Larvae</b>	Feeding in husks of nuts	July to March
<b>Pupae</b>	In husk of nuts	February to April
<b>Adult</b>	Flying	Early Spring to Summer

**Overwinter** - Larvae in husk.

**Most Likely Way of Introduction** - Larvae in husk.

**Generations per Year** - one to four.

### 5.2.39 JAPANESE BEETLE – *POPILLIA JAPONICA*

**Quarantines**

- State Exterior (CCR 3280)
- Federal Domestic (CFR 301.48)

**Type of Pest - Insect**, Order - Coleoptera (Beetles)

**Hosts** - Leaves, blossoms, and fruit of more than 250 plants, shrubs, and trees.

**Nature of Injury** - The larvae/grubs feed on the roots of various plants and often cause serious damage to turf in lawns, parks, golf courses, pastures, and other turf areas. Adults feed on fruit and foliage. Peaches and stone fruits, especially, are badly damaged by adult feeding.

**Life Cycle** - Japanese beetles spend about 10 months as grubs in the soil. In late May or early June, the grubs stop feeding and go through a short resting, or pupae stage, after which they become beetles. The adults dig their way out of the soil. By early July, they are flying about in numbers and feeding on trees and plants. During July and August, the females periodically go into the ground and lay eggs.

**Description** - Egg white eggs in groups two to six inches deep in the soil. Larvae whitish grub with brown head. Grubs have distinct legs. Adult distinguishing marks are metallic green to greenish bronze with reddish wing covers (7/16 inch wing).

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	Soil	August to September
<b>Larvae</b>	Soil	September to June
<b>Pupae</b>	Soil	June and July
<b>Adult</b>	Foliage/Fruit	June to September

**Overwinter** - Larvae in soil, may take up to two years to develop in cold wet soils.

**Likely Way of Introduction** - Larvae feeding on roots, especially when crown gall is present.

**Generations** - One annually.

#### 5.2.40 KHAPRA BEETLE – *TROGODERMA GRANARIUM*

**Quarantine** - Federal Foreign (CFR 319.75)

**Type of Pest** - Insect, Order - Coleoptera

**Hosts** - Stored grain products (wheat, barley, rice), peanuts.

**Nature of Injury** - Larvae feed on stored products, usually in the top 12 inches. Larva can persist for one to two years in a diapause-like state if food is scarce.

**Life Cycle** - Eggs hatch into larvae in five to seven days. Larvae are about 1/4 inch long when full grown and feed on stored products. Under optimum conditions, the larvae can become fully developed in four weeks, going through 2-11 molts, passing the cast skins in the stored product. The cast skins are often the first signs of infestation. Pupa is enclosed in the last larval skin. Adults emerge and mate almost immediately. Adults live one to two weeks and do not feed or fly. Females can lay up to 80 eggs.

**Description** - Eggs are about 1/64 inch long, and white. Larvae are yellowish-white upon hatching; they change to reddish-brown as they shed their skins. Mature larvae are 1/4" long. Pupae are 1/4 inch long and are enclosed in the last larval skin. Adult oval shaped, up to 1/8" long, brown too blackish with fine setae. Elytra have indistinct lighter brown patterns on them.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	Host	Year-round
<b>Larvae</b>	Host	Year-round
<b>Pupae</b>	Host	Year-round

Adult	Host	Year-round
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**Overwinterers** - All stages.

**Likely Way of Introduction** - All Stages.

**Generations per Year** - Up to 10.

#### 5.2.41 MEDITERRANEAN FRUIT FLY – *CERATITIS CAPITATA*

##### Quarantines

- State Interior (CCR 3406)
- Federal Foreign (CFR 301.78)

**Type of Pest** - Insect, Order - Diptera (Flies)

**Host** - over 200 species of fruits, nuts, vegetables, and berries including citrus, kiwi, pepper, papaya, sapote, quince, persimmon, loquat, apple, fig, walnut (in husk), mango, olive, avocado, almond (in husk), cherry, peach, plum, pear, grape, and guava.

**Nature of Injury** - Feeding by larvae causes breakdown of interior fruit tissues. Females use their ovipositor to puncture the epidermal layer of fruits. The punctures admit decay organisms, resulting in subsequent breakdown of fruit. Premature fruit drop is common.

**Life Cycle** - Eggs are deposited in groups about 1 mm or deeper under the skin of the host fruit. Incubation takes two to three days. The larvae feed in groups within the pulp of maturing fruit. Three instars stages take 10 to 14 days to complete development. Pupation usually takes place in the soil under a tree, in a cylindrical, reddish-brown puparium.

**Description** - Egg smooth, white, very slender and curved; about 1 mm. in length. Larvae a whitish yellow headless maggot. Pupae a reddish-brown elongate puparium. Adult red and blue iridescent eyes, brown head, 3.5 to 5 mm long, thorax black with white and yellow markings, wings hyaline but with yellow and brown bands measuring 1/4 inch.

Stage	Place	Time
Egg	Under the skin of fruit or vegetable	All Year
Larvae	In flesh of fruit or vegetable	All Year
Pupae	In soil	All Year
Adult	About fruit or vegetable	All Year

**Overwinter** - All stages in warm climates. Pupa in cooler climates.

**Likely Way of Introduction** - Eggs and larvae in fruit.

**Generations Per Year** - Dependent upon temperature and other environmental factors.

#### 5.2.42 MELON FRUIT FLY – *DACUS (=BACTROCERA) CURCUBITAE*

##### Quarantines

- State Interior (CCR 3425)
- Federal Domestic (CFR 301.97)

**Type of Pest** - Insect, Order - Diptera (Flies)

**Hosts** - Larvae feed in melons of all kinds and all squash, tomatoes, string beans, cow peas, egg plant, pumpkins, bitter gourd, some cucumbers, kohlrabi, and certain other fruits, such as mango, papaya, etc.

**Nature of Injury** - Eggs are laid in the host fruit or vegetable through a puncture made using the ovipositor. Upon hatching, larvae burrow through the host fruit causing interior breakdown of the flesh.

**Life Cycle** - Eggs and maggots are found within fruit or vegetable. When larvae/maggots are full grown they emerge from the fruit and burrow into the soil where they change into pupae. Adult flies emerge in a few days. Under hot conditions, the entire cycle from egg to adult is about 15 days.

**Description** - Egg slender, white, elliptical. Larvae pale yellowish white, cylindrical, tapering slightly toward the head end (no distinct head on maggots). Pupae cylindrical, dull luteous to deep reddish yellow. Adult reddish yellow fly or near housefly size. Wings banded with a large apical spot in each wing.

Stage	Place	Time
Egg	Under the skin of fruit or vegetable	All Year
Larvae	In flesh of fruit or vegetable	All Year
Pupae	In soil	All Year
Adult	About fruit or vegetable	All Year

**Overwinter** - Probably all stages.

**Likely Way of Introduction** - Larva stage in fruit or vegetables.

**Generations** - Varies, depending on temperature and environmental factors.

### 5.2.43 MEXICAN FRUIT FLY – *ANASTREPHA LUDENS*

**Quarantines**

- State Interior (CCR 3417)
- Federal Domestic (CFR 301.64)

**Type of Pest** - Insect, Order - Diptera (Flies)

**Hosts** - Over 200 hosts. Nearly, all citrus and deciduous fruits. Sour limes, lemons and grapefruit are preferred host.

**Nature of Injury** - Eggs are laid below the surface of the fruit. The maggots upon hatching burrow through the fruit causing interior breakdown of the flesh. Full-grown larva drop to the ground and pupate in the soil, emerging later as adult flies.

**Description** - Egg green color. Larvae white, dirty white or yellowish-white and pointed at one end where the black mouth hooks are plainly visible, although the larva does not possess a distinct head. Larvae are legless. Pupae brownish. Adult yellowish-brown color. Longitudinal markings, somewhat lighter color, are found on the thorax with a small median spot of dark brown. The wings are transparent where they are not mottled and striped with yellowish-brown bands. The inverted "V" on the lower part of the outer half of the wing is not connected at the main pattern, distinguishing this species from others. The ovipositor sheath of the female is very long, slender and tube-like, longer than remaining body.

Stage	Place	Time
Egg	Under the skin of fruit or vegetable	All Year
Larvae	In flesh of fruit or vegetable	All Year
Pupae	In soil	All Year

<b>Adult</b>	About fruit or vegetable	All Year
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**Overwinter** - All Life Stages.

**Likely Way of Introduction** - Eggs and larvae in Fruit.

**Generations Per Year** - Variable, dependent upon temperatures.

#### 5.2.44 NUT TREE CASEBEARERS – *ACROBASIS SPP.*

**Quarantine**

- State Exterior (CCR 3260)
- State Exterior (CCR 3273)

**Type of Pest** - Insect, Order - Lepidoptera (Butterflies and Moths)

**Hosts** - Pecan, Hickory, and Walnut

**Nature of Injury** - Larvae emerge from winter cases or hibernacula and feed voraciously upon unfolding buds and leaves. Since the larvae are not discriminating in feeding habit, they devour the blossom buds as well as the leaf buds. On badly infested trees, larvae consume foliage as fast as it is put forth.

**Life Cycle** - Adult moths emerge from May to July, depositing eggs almost immediately on underside of leaf, usually near junction of a vein with midrib. Average length of life of adult stage is about five days. When hatched, larvae soon construct slender cases about 18 mm. long, which are always attached to leaf petioles. The position of the larva pulls down two or more leaf tips and fastens them to its case, in order to feed without continually moving position of case. Mature larvae are about 14mm long. In autumn, just before leaves fall, larvae migrate to young buds where winter hibernacula are constructed.

**Description** - Larvae reddish brown with black head. Adult moth, brownish color.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	Underside of leaf	Late Spring
<b>Larvae</b>	Feeding on buds and leaves	Summer and Fall
<b>Pupae</b>	By buds and larval case	Spring
<b>Adult</b>	Flying around host	Late Spring

**Overwinter** - Larvae overwinter in hibernacula by buds.

**Likely Way of Introduction** - Larvae and pupae on nursery stock.

**Generations** - One generation a year.

#### 5.2.45 OLIVE FRUIT FLY – *BACTROCERA OLEAE*

**Quarantine** - State Interior (CCR 3431)

**Type of Pest** - Insect, Order – Diptera

**Hosts** - Fruits on wild, ornamental or commercial olive plants.

**Nature of Injury** - The larvae cause fruit drop and reduced yield. Serious infestation affects oil volume, alters its color and increases acidity.

**Life Cycle** - Eggs and larvae are found within the fruit. The first four generations of the fly pupate within the epidermis (outer skin). However, the fifth or last generation overwinters in the soil as a pupa. Adult flies overwinter close to the host plants.

**Description** - Larvae yellowish-white, attaining a length of 5 to 6 mm and occur one per fruit. Adult is about 5 mm long. The head is yellowish to light brown and the thorax is dark brown with three darker parallel lines. The abdomen is pale brown with three pairs of black bands. The clear wings have a dark spot at the apex.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	Fruit	August
<b>Larvae</b>	Fruit	August
<b>Pupae</b>	Epidermis of Fruit/Soil	*September/Winter
<b>Adult</b>	Host plants	Winter

**Overwinters** - Pupae or Adult.

**Likely way of Introduction** - Fruit.

**Generations per Year** - 2 to 5.

*\*Last generation only.*

#### 5.2.46 ORIENTAL FRUIT FLY – *BACTROCERA DORSALIS*

**Quarantines**

- State Interior (CCR 3423)
- Federal Foreign (CFR 301.93)

**Type of Pest** - Insect, Order - Diptera

**Hosts** - include more than 150 species of tropical and subtropical fruits and vegetables, e.g. citrus, stone and pome fruits, tomato, and avocado.

**Nature of Injury** - Larval feeding reduces interior of fruit to a rotten mass. Egg punctures admit decay organisms. Ripe fruit preferred.

**Life Cycle** - Eggs and larvae are found in fruits or vegetables. When full grown, larvae merge from the fruit/vegetable, drop and burrow into the soil where they pass the pupation period. Adult flies emerge in a few days. The entire cycle from egg to adult, is about 15 days, under warm conditions.

**Description** - Eggs slender, white elliptical about 1 mm long. Deposited under skin of fruit in groups of 3 to 30. Larvae a headless maggot, creamy white, length 10 mm, 11 segments and feeds inside the fruit/vegetable. Larvae pass through three instars. The third instar larvae drop to the ground where they pupate. Pupae tan to dark brownish yellow, 5 mm long, pupation usually occurs a short distance under soil surface, but soil not necessary for survival. Adult usually is a little larger than a housefly, mostly yellow with dark markings on thorax and abdomen. Wings clear. Female can produce more than 1,000 eggs.

Stage	Place	Time
Egg	Under fruit/vegetable skin	All year
Larvae	In flesh of fruit or vegetable	All year
Pupae	In soil	All year
Adult	About fruit or vegetable	All year

**Overwinterers** - All stages.

**Likely Way of Introduction** - Egg and Larvae in fruits/vegetables.

**Generations Per Year** - Twelve to fifteen.

#### 5.2.47 PECAN PHYLLOXERA – *PHYLLOXERA DEVASTATRIX*

**Quarantine** - State Exterior (CCR 3260)

**Type of Pest** - Insect, Order - Homoptera (Scales, aphids, leafhoppers, mealybugs, whiteflies, etc.)

**Hosts** - Pecan

**Nature of Injury** - These insects are found within galls, produced by tree as a defensive reaction to the feeding pest. The formation of galls causes new growths and shoots to be weakened, malformed, and finally die. Severe infestation can destroy entire limbs.

**Description** - The insect overwinter in the egg stage in protected places on the branches. The nymphs appear in the spring, when the new buds unfold. The nymphs then insert their beaks into new growth, causing a gall to form that soon envelopes the insect. The nymph matures in the gall. After these eggs hatch, and the young insects mature into adults (winged forms), the gall splits open and releases the insects, usually in late May or June. This winged adult is very minute (being about only 1 mm long), oval or pear-shaped, and yellowish-green to yellowish-brown in color.

Stage	Place	Time
Egg	On bark or in galls	All year
Nymph	In galls	Spring to Fall
Adult	Flying, crawling, or in galls	Spring to Fall

**Overwinter** - As egg in protected area on bark.

**Most Likely Way of Introduction** - All life stages can be introduced in galls, on nursery stock.

**Generations per Year** - Several.

#### 5.2.48 PECAN WEEVIL – *CURCULIO CARYAE*

**Quarantines** - State Exterior (CCR 3273)

**Type of Pest** - Insect, Order - Coleoptera

**Hosts** - Pecan and hickory nuts.

**Nature of Injury** - The worst damage is a result of larval feeding on the “meats” of the nut. Adults feeding on plants also cause damages. Egg-laying females cause damage by boring into the nut with their snouts, creating a cavity in which to lay

eggs. These holes may permit fungi and other plant pathogens to enter the nut. Infested nuts generally drop to the ground prematurely. When the crop is light, and the infestation heavy, the entire crop may be lost.

**Description** - Eggs are small, white, deposited in maturing nuts, hatching in 7 to 10 days. Larvae typical weevil larva; yellowish-white in color, legless, having a brown head; about 10 to 12 mm in length at maturity; and are naturally curved into a "c" shape. Pupae white to yellow in color, about 9 mm in length; found in an earthen cell 4 to 12 inches below the surface of the soil. Adult brownish or grayish, with scattered yellow hairs on ventral side; snout slender and curved, being much longer than the body in the female, about half as long in the male.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	Surface of maturing nuts	August to early September
<b>Larvae</b>	Feeding inside nut	September to November
<b>Pupae</b>	In soil, 4" to 12" deep	All year (1-2 years)
<b>Adult</b>	About trees	Late July to September

**Overwinter** - As pupae in the soil.

**Most likely Way of Introduction** - are eggs and larvae in nuts.

**Generations Per Year** - is one generation every two or three years.

#### 5.2.49 PERSIMMON ROOT BORER – *SANNINA UROCERIFORMIS*

**Quarantines** - State Exterior (CCR 3265)

**Type of Pest** - Insect, Order - Lepidoptera (Moths and Butterflies)

**Hosts** - Persimmon

**Nature of Injury** - The larvae tunnel on the taproot of the persimmon from 18 to 22 inches under the ground.

**Life Cycle** - Adults emerge in the Gulf States during April and May; in more temperate regions during June and July. The eggs are laid or dropped at the base of the trees, preferably young saplings. Pupal cases are constructed of grass and chips on the root and are connected with the larval tunnels. On saplings the pupal cases are frequently found above the ground.

**Description** - Larvae whitish with a dark brown head and plate behind the head. The caterpillar has legs. Pupae brown in color. Adult looks like wasps. Forewings are dark in color from base to tip. Rear wings are dark at tip and transparent at base. Body scale tufts at tip of abdomen, fantail shape, but in three finger-like projections. Body is dark in color with one wide, reddish-orange band. Thorax, or the areas behind head, with a reddish-orange band around base of head, also a similar band about the base of the wings.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	At base of trees	April; for several months
<b>Larvae</b>	Tunnel in trees	All year
<b>Pupae</b>	Cocoon in tunnel	April and May
<b>Adult</b>	Fly (tree base -daytime)	Spring to Fall

**Overwinter** - Larvae.

**Likely Way of Introduction** - are larvae in trees.

**Generations Per Year** - One every two or three years.

#### 5.2.50 PINK BOLLWORM – *PECTINOPHORA GOSSYPIELLA*

**Quarantines**

- State Interior (CCR 3409)
- Federal Domestic (CFR 301.52)

**Type of Pest** - Insect, Order - Lepidoptera (Butterflies and Moths)

**Hosts** - Cotton and okra - possibly hollyhock and other malicious plants. Used cotton harvesting equipment and bagging.

**Nature of Injury** - The small pinkish caterpillars eat both lint and seeds of the cotton plant and reduce yield, weight, vitality, and oil content of the seeds. They also reduce the quantity and quality of the lint. Severe infestations cause squares and small bolls to shed.

**Life Cycle** - The female lays 100 to 200 tiny eggs. The young caterpillar bores into a square or boll where it feeds 10 to 14 days. When full-grown, it cuts a round hole through the boll and either change to a pupa within the boll or drops to the ground to pupate. Development from egg to adult takes 25 to 30 days in midsummer. There may be as many as four to six generations a year in areas with long growing seasons. Larvae that develop late in the season may pass the winter in seed, old bolls, and trash in the fields or at the gins, and in cracks in the soil.

**Description** - Egg greenish white. Larvae are pinkish white (pinkish on the upper part). Pupae smooth, covered with fine pubescence, and brown in color. Adult small, dark-brown moths.

<b>Stage</b>	<b>Place</b>	<b>Time</b>
<b>Egg</b>	All over plant	Spring to Fall
<b>Larvae</b>	Lint and seeds	All year
<b>Pupae</b>	In boll or soil	Spring to Fall
<b>Adult</b>	General area	Spring to Fall

**Overwinter** - Larvae in seed, old bolls, trash and soil.

**Likely Way of Introduction** - Larvae.

**Generations Per Year** - Four to six.

#### 5.2.51 PLUM CURCULIO – *CONOTRACHELUS NENUPHAR*

**Quarantines** - State Exterior (CCR 3266)

**Type of Pest** - Insect, Order - Coleoptera (Beetle)

**Hosts** - Apple, apricot, cherry, nectarine, peach, pear, plum, prune, and quince.

**Nature of Injury** - The adults attack the fruit soon after it sets. The surface of the fruit is scarred or distorted by the round feeding holes and egg laying punctures of the Curculios. The burrowing of the larvae or grubs injures the inside.

**Life Cycle** - Eggs are laid in crescent shaped cuts, which the females make in the fruit. Eggs hatch in about a week. Larvae are yellowish-white; become full grown in about two weeks. Mature larva drops to the soil where it completes their development into adult beetle.

**Description** - Egg pale green. Larvae whitish, legless grub with brown head. Pupae light brown. Adult dark brown to blackish in color with grayish and whitish patches. Most striking means of identification are four black humps on the wing covers.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	In fruit	Spring
<b>Larvae</b>	In fruit	Spring and Summer
<b>Pupae</b>	Ground	Summer
<b>Adult</b>	Ground, Rubbish	Fall through Spring

**Overwinter** - Adult.

**Likely Way of Introduction** - Larvae in fruit.

**Generations per Year** - One.

#### 5.2.52 RED IMPORTED FIRE ANTS – *SOLENOPSIS INVICTA*

**Quarantine**

- State Interior (CCR 3432)
- Federal Domestic (CFR 301.81)

**Type of Pest** - Insect, Order - Hymenoptera

**Nature of Injury** - Stings animate objects and may cause death to small or newborn animals. They attack a wide variety of sprouting plants below ground especially bunch beans, cabbage, collards, eggplant, okra, and potato. Leaves and stalks of corn and potato vines can be chewed off. They girdle young citrus plants at bud union. Hardened ant mounds damage or break farm equipment.

**Life Cycle** - Sexually mature winged forms may be found at almost any time of year. A mating flight occurs in the spring. After mating, a mated female finds a protected crevice or makes an excavation one to four inches deep in soil, casts off her wings and lays 10 to 15 eggs. The queen feeds the first larvae from food in her body. The care for following broods is done by adults from the first laid eggs. As the colony grows, underground boring continues to a depth of up to three feet. In hot dry weather, mounds remain small or absent. Under cooler moist conditions, mounds develop to 10 inches above the soil level and 15 inches in diameter in marshy terrain. In heavy soil a hard crust covers the honeycombed mound with galleries ranging from almost nothing up to 1-1/4 inches in diameter. Mound construction is generally at night. Exits are usually plugged and invisible during day. The coneshaped area below the mound contains most of the colony. Lateral tunnels are constructed to various distances, some with openings over 100 feet from the mound.

**Description** - Eggs smooth, shiny white, laid by the fertilized queen in galleries. Larvae dirty white, legless, sparsely covered with recurved hair. Pupae are shiny white about the size of adults. Adult males are slightly smaller than wingless workers. There is no division of work between castes - both do the care of young, foraging, mound building, and protecting the colony. Coloration of workers varies between colonies from light brown to nearly black. A broad orange band on the dorsum is distinct on workers of darker colonies, but obscure on light colored colonies. Males are uniformly black. The queen coloration is like the workers.

Stage	Place	Time
Egg	In soil chambers	Spring - Fall
Larvae	In soil chambers	Spring - Fall
Pupae	In soil chambers	Spring - Fall
Adult	In soil chambers	All Year

**Workers Foraging** - Excavating all year except hot summer.

**Overwinter** - Adults in colonies.

**Likely Way of Introduction** - Plants, soil, plant litter.

**Generations Per Year** - The duration from the laying of the egg to emergence of adult varies from 25 to 30 days.

### 5.2.53 SUGARCANE BORER – *DIATRAEA SACCHARALIS*

**Quarantine** - State Exterior (CCR 3272)

**Type of Pest** - Insect, Order - Lepidoptera (Butterflies and Moths)

**Hosts** - Various crops including sugarcane, corn, rice, and sorghum. Various wild grasses and pampas grass are also attacked.

**Nature of Injury** - Losses are primarily the result of larval feeding within the stalk. This results in “dead hearts”, dead tops broken stalks, reduction in weight and sucrose content of harvested cane (up to 20%),. Other losses spoilage of bored stalk due to secondary damage from fungi, and deterioration of bored seed cane. Severe damage from this pest extends to corn and rice in heavily infested areas.

**Description** - Egg flat and elliptical, about 1.6 mm long; laid in clusters of about 25 eggs each; creamy white in color, turning yellowish-white with maturity. Larvae all but the overwintering larvae are a deeper yellow with spots absent or only faintly evident; about 25 mm in length at maturity. Pupae found within the borer tunnel in the stalk; ranges from light to dark brown in color; reaching a length of 18 to 20 mm. Adult straw colored moth having each forewing marked with a somewhat V-shaped design of black dots. The fore wings are usually slightly darker than the hind wings. Size may vary but averages about 25 mm from tip to tip of the spread wings.

Stage	Place	Time
Egg	Underside of leaf	Spring through Summer
Larvae	In host stalks	All Year
Pupae	In host stalks	Spring through Summer
Adult	Flying about host	Spring through Summer

**Overwinter** - As larvae in host plant stalks.

**Most Likely Way of Introduction** - Larvae or pupae in stalks.

**Generations per Year** - One to three.

### 5.2.54 SWEET POTATO WEEVIL – *CYLAS FORMICARIUS ELEGANTULUS*

**Quarantines**

- State Interior (CCR 3257)

- State Exterior (CCR 3429)

**Type of Pest - Insect**, Order - Coleoptera (Beetles)

**Hosts** - Sweet potato, *Ipomoea batatas*, and all closely related morning glories of the genus *Ipomoea* (ornamental or wild succulent types). *Convolvulus* spp., common morning glory field-weed, may be fed upon, but are not a host for breeding purposes.

**Nature of Injury** - The adult weevils injure the sweet potato plant by feeding on the leaves, vines, and roots. The larvae feed within the stems, roots, and potatoes. Small holes in groups on the surface of potatoes are either feeding marks or holes made by females in laying their eggs. Newly developed weevils make larger holes when they emerge from the sweet potatoes. Weevil damaged potatoes are cut open. The grub-made tunnels can be seen, often with larvae or pupae in them. Infested sweet potatoes have a bitter taste and are unfit for consumption.

**Life Cycles** - The weevil lays its eggs in holes made in the stems of sweet potato plants or directly in the potatoes. In about a week, the eggs hatch into small white larvae, which feed and grow in the vines or in the potatoes. The larvae reach their full growth in two or three weeks and pupate in the stem or potato. Adult weevils emerge in seven or eight days.

**Description** - Egg dull white. Larvae legless grub, white with brown head. Pupae yellowish-white. Adult body and snout metallic blue, legs and thorax reddish-brown, 1/4-inch long. The body markings are very characteristic.

Stage	Place	Time
Egg	Tuber and stem	All Year
Larvae	Tuber and stem	All Year
Pupae	Cavity in root	All Year
Adult	Leaves and stem	All Year

**Overwinter** - All stages.

**Likely Way of Introduction** - All stages.

**Generations Per Year** - Every four to six weeks during growing season.

## 5.2.55 WALNUT HUSK FLIES

*Rhagoletis boycei*  
*Rhagoletis saavis*  
*Rhagoletis juglandis*\*

**Quarantines** - State Exterior (CCR 3273)

**Type of Pest - Insect**, Order - Diptera (Flies)

**Host** - Walnut (*R. completa* also attacks peach)

**Nature of Injury** - Moist decay of the inner husk tissue where the larvae fed causes a staining or blackening of the shell. This coloration is probably caused by tannin released from the infested tissue. This stain cannot be removed by bleaching and the infested nuts are classed as culls.

**Life Cycle** - Adult flies begin to emerge from the soil beneath infested trees from July until October. About 10 to 15 days after they emerge from the soil they begin to lay eggs. One female may deposit from 200 to 400 eggs in her lifetime. The

eggs are deposited in groups of about 15 in a small cavities made on green husk tissues. The eggs hatch in 5 to 10 days. The larvae begin to tunnel through the inner husk. The larvae become full-grown in about one month, emerge from the husk and drop to the soil where they burrow several inches into the soil and pupate. There is usually only one generation of husk flies per year. Only about 70 percent of the flies emerge at the end of the first year. The rest require two, three, or four years to emerge.

**Description** - Egg small curved and pearly white. Larvae whitish and semi-transparent, pointed at the head end. Pupae barrel-shaped, straw colored and resembles a grain of wheat. Adult about housefly size, varying in color from tawny to blackish with dark bands on the wings.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	Cavity in husk	July to mid-October
<b>Larvae</b>	Inner walnut husk	July to September
<b>Pupae</b>	Soil	September to July
<b>Adult</b>	About husk	July to mid-October

**Overwinter** - Pupae stage in soil.

**Likely Way of Introduction** - Eggs and larvae in unhusked walnuts.

**Generations per Year** - One.

*\*Description applies to all species listed.*

#### 5.2.56 WESTERN GRAPE-LEAF SKELETONIZER - *HARRISIANA BRILLIANS*

##### County Ordinance

**Type of Pest** - Insect, Order - Lepidoptera (Moths and Butterflies)

**Hosts** - Grape is the most significant host. Other hosts include Virginia creeper, Boston ivy, apricots, almonds, cherries and roses.

**Nature of Injury** - Larvae feed on leaves causing defoliation of vines.

**Life Cycle** - Eggs are laid in clustered groups of up to 300. Average count is 100. Eggs in a cluster group all hatch at the same time. The larvae begin to feed on underside of the leaf, lined up side by side in a circular row. Larvae progress through five instars stages.

**Description** - Egg capsular-shaped, 0.4 mm wide and 0.6 mm long. Usually pale yellow but can be whitish. Larvae unique body-ring colorations, consisting of two wide brown bands that mark the body into three: a forward, middle, and posterior sections. There are five narrow brown bands: two on the forward portion, one on the middle section between the wide brown bands, and two on the posterior. Body color between bands is pale brown. Pupae spin silken cocoons in which to pupate. The cocoons, irregular in shape, dirty white in color are found in trash around the base of vines or under loose bark on the trunk and cordons. Adults are bluish black to greenish black color. Body length is about 16 mm. Moths have comb-like bristles projecting from the antennae. However, the male's bristles are twice as long as the females.

<u>Stage</u>	<u>Place</u>	<u>Time</u>
<b>Egg</b>	Underside of leaf	Spring to September

<b>Larvae</b>	Underside of leaf	May/June to October
<b>Pupae</b>	Ground/vine	Winter
<b>Adult</b>	Vineyard	Spring to Fall

**Overwinter** - Pupae.

**Likely Way of Introduction** - Infested Nursery stock.

**Generations per Year** - About three.

### 5.2.57 BURROWING NEMATODE – *RADOPHOLUS SIMILIS*

**Quarantines** - State Exterior (CCR 3271)

**Type of Pest** - Endoparasitic Nematode

**Hosts** - Very extensive and includes Citrus, avocado, agnolia, banana, philodendron, anthurium, strelitzia (Bird of Paradise), ginger, Cyprus including nutgrass, bamboo, sweet potato, othos, are some of the more important hosts.

**Symptoms** - Citrus appears to be the most severely affected. The disease is called "Spreading Decline" because it spreads in a somewhat circular fashion from the area of infestation at the rate of about one and one-half tree rows per year. The general appearance of infected plants is nonspecific. Symptoms are generally unthriftiness, stunting, sparseness of foliage, smallness of fruit, yellowness or off-color of leaves, dying back of leaves, and other symptoms that would be expected of root or crown injury. Brownish to blackish lesions on roots may be present and feeders may be girdled. Secondary decay of roots will follow.

**Life Cycle** - The nematode does not produce cysts and is killed fairly easily by soil fumigants

**Inspection for Burrowing Nematode** - Positive identification is done by recovering and identifying the nematode itself. This will require a microscope and trained nematologist. However, suspicion should be directed toward trees whose appearance and distribution correlate to the disease symptoms. The general presence of other nematodes in California, often tend to mask root symptoms. Inspections for this pest also result in the detection and rejection of shipments infested with other serious nematodes, such as the reniform nematode.

### 5.2.58 GOLDEN NEMATODE

*Heterodera rostochiensis*

*Globodera rostochiensis*

"Potato Nematode"

**Quarantine** - Federal Domestic (CFR 301.85)

**Type of Pest** - Cyst nematode.

**Hosts** - Potato, tomato, eggplant, snapdragon, and various solanaceous weeds.

**Symptoms** - Infested plants grow slowly and develop poorly. Infected potatoes form only one to three stems, with very small or no tuber formation. Other symptoms include wilting of the lower and then upper leaves followed by gradual wilting of the entire plant commencing about June.

**Life Cycle** - Viable eggs may remain in the cysts for seven or eight years until a favorable host plant is present. Not all the eggs hatch at one time. The nematode can move from one point to another in all stages of development with the aid of such materials as potato tubers, cyst-infested soil, agricultural equipment and human and animal feet. Cysts can also be moved by rain, water and wind.

**Description** - This cyst nematode's principal host is potato. It greatly reduces production in severely infected fields. Since it is limited to specific hosts, crop rotation or host free period are the best means of control or eradication in infected areas. This nematode is very widespread in the temperate zones of the world. At the present time the only known infestation in North America are in New York on Long Island and in two western counties of that state.

**Inspection for Golden Nematode** - The Nematode attacks both the roots and tubers. Soil clinging to tubers, roots and other plant material is removed or washed off with water and processed in a laboratory.

**Control** - the most effective measures for control are crop rotation, treating the soil with nematicides and use of nematode-resistant potato varieties.

#### 5.2.59 RENIFORM NEMATODE – *ROTYLENCHULUS RENIFORMIS*

**Quarantine** - State Exterior (CCR 3271)

**Type of Pest - Endoparasitic Nematode.**

**Hosts** - Over 140 plant species; a large number of cultivated plants and fruit trees including but not limited to, banana, citrus, coffee, cotton, jackfruit, mango, okra, papaya, pineapple, potato, rice, soybean, sugarcane, sweet potato and tea.

**Symptoms** - Infestation results in discoloration of the roots, drying and shedding of leaves and small malformed seeds with poor quality. The nematode is an important factor in the incidence of Fusarium and Verticillium wilts of cotton.

**Life Cycle** - Eggs hatch in about eight days; larvae develop into adults in about nine more days; larvae develop through three molts to preadult stage without feeding. All larval stages and males are found in the soil. The nematode is capable of surviving in air-dried soils for extended periods of time.

**Inspection for Reniform Nematode** - After the larvae's final molt, the young female adult as the infective stage, seeks to penetrate host roots. Feeding occurs on cortical tissue, phloem and pericycle. The nematode prefers fine textured soils with a relatively high content of silt and/or clay. Inspections for this pest also result in detection and rejection of shipments infested with other serious nematodes, such as the burrowing nematode.

#### 5.2.60 HYDRILLA – *HYDRILLA VERTICILLATA*

**Quarantine**

- State Interior (CCR 3410)
- State Exterior (CCR 3281)

**Type of Pest - Aquatic Weed**

**Description** - Hydrilla is an aquatic weed that can restrict water flow and render recreational lakes and ponds unusable by its thick growth. The weed was probably first introduced from South America into Florida about 1960. It was sold as an aquarium plant. Hydrilla has appeared in several states including Alabama, California, Georgia and Texas.

### Identifying Characteristics

1. Submerged, bottom-rooted perennial herb with long branching stems which may break loose and form floating mats.
2. Lower leaves opposite and small, middle and upper leaves in whorls of 2 to 8 and somewhat larger.
3. Leaves sessile, linear-lanceolate, 10-20 mm, long and 2-5 mm wide with sharply toothed margins. There may be a prominent red midrib.
4. Glands protrude along the midrib on the bottom inside of the leaves (a feature absent in *Elodea* species).
5. Turions form in some leaf axils, tubers develop on the ends of subterranean rootstocks.
6. Analogous Species:
  - a. Brazilian Elodea, *Elodea densa*. This species of *Elodea* has a smooth, soft leaf texture and green midribs. Similar characteristics also distinguish *Elodea canadensis* from Hydrilla.
  - b. Water-milfoils, *Myriophyllum sp.* The submerged leaves of this species are pinnately divided into capillary lobes. Leaves are smooth margined.

#### 5.2.61 WITCHWEED – *STRIGA ASIATICA*

**Quarantine** - Federal Domestic (CFR 301.80)

**Type of Pest** - Parasitic herbaceous annual plant

**Hosts** - Corn, sugarcane, sorghum, Sudan grass, millet, grasses, and others.

**Description** - The plants are normally 8 or 9 inches high, seldom over 12 inches and of a bright green color. Leaves are alternate, slender, and slightly hairy on both sides. Aerial stems appear somewhat square caused by four ridges running lengthwise, while the underground parts are round. Roots entwine with those of the host plant, are white to purple in color with small scale-like leaves. Small suction cup-like swellings on root terminals are attached to the host. The flowers are usually orange-red, occasionally yellow to pink. Each flower has an irregular two-lipped corolla.

**Life Cycle** - Germination begins like an ordinary plant but soon attach, itself to the host for water and nutrients. The vegetative parts that appear above ground turn green and begin manufacturing chlorophyll and food. It becomes semi-parasitic, deriving some water and minerals from the host. An unknown secretion from hosts is believed necessary to start seed germination otherwise the seed remains dormant for years. New seeds become ready three to four months after germination. Each plant produces 50,000 to 500,000 minute seeds.

**Inspection for Witchweed** - Examine host plant for white and purplish root systems and the bell-shaped attachments. Bright green secondary growths with square-shaped aerial stems should be suspected. Seeds are visible under a microscope.

#### 5.2.62 RELATED LINKS

##### CDFA Plant Pest Ratings

- [Invertebrates](#)
- Pathogens/Diseases
  - [Bacteria](#)
  - [Fungi](#)

- [Nematodes](#)
- [Viruses, virus-complexes](#)
- [Vertebrates](#)
- Weeds
  - [Noxious Weeds](#)
  - [Weed Policy](#)

**Invasive Species Information**

[Invasive Species Search](#)

[National Agricultural Pest Information System](#)

### 5.3 REVIEW QUESTIONS

1. A shipment of feed grain infested with white horse nettle seed should be rejected under the authority of provisions of the?
  - A. California Code of Regulations (CCR)
  - B. California Food and Agricultural Code (FAC)
  - C. Plant Pest Act
  - D. California Seed Law
  
2. Philodendron plants shipped to California from Michigan and accompanied by an origin certificate stating that they were grown in Florida:
  - A. Must be rejected unless they bear a valid Florida Burrowing and Reniform Nematode certificate
  - B. Are admissible provided they have been fumigated with Methyl Bromide at origin
  - C. Are in violation of the Burrowing and Reniform Nematode Quarantine and must be rejected unless they have been found free of nematodes by laboratory sampling
  - D. Do not need to be sampled if they bear a valid Burrowing and Reniform Nematode certificate
  
3. A commercial shipment of plants established in soil from Maryland, a state covered under the Japanese Beetle Exterior Quarantine, should be accompanied by a:
  - A. A federal "Shipping Point Inspection" certificate
  - B. Certificate signed by the county agent at the point of origin
  - C. Certificate executed by an inspector of USDA's Plant Protection Service
  - D. Certificate issued by an authorized state official issued at origin that the plants were treated for Japanese beetle by a method prescribed by the Secretary (CDFA)
  
4. Which of the following applies to a shipment of plants from Hawaii?
  - A. Subject to terminal inspection only
  - B. Entry permitted under permit from the state of Hawaii
  - C. No restriction at the present time
  - D. Must be certified as to freedom from Burrowing and Reniform Nematode
  
5. The best time to inspect vegetable seed for seed borne diseases is:
  - A. During the growing season

- B. Immediately after harvest and before the seed has been cleaned
  - C. In the laboratory after cleaning and processing
  - D. After the seed has been in storage for six months, as disease may cause a musty odor to the seed
6. In accordance with "Procedure for Handling Plant Quarantine Shipments" (Memorandum of Understanding), which of the following would not be a valid reason for rejection:
- A. A shipment that is infested with an insect pest of limited distribution
  - B. A shipment that is infected with a serious plant disease new to California
  - C. A shipment that you have reasonable cause to presume to be infected with a disease under eradication
  - D. A shipment that you have reasonable cause to presume to be infected with a weed pest under eradication
7. A shipment of gerbils arriving in California from New Jersey should be rejected under:
- A. California Fish & Game Regulations
  - B. California Public Health Regulations
  - C. USDA Regulations
  - D. The Lacy Act
8. A laboratory desiring a permit to receive and handle plant quarantine material should make application by letter through their County Agricultural Commissioner to CDFA. The initial inspection for approval of the laboratory will be made by a:
- A. Representative of the County Agricultural Commissioner, USDA, and CDFA
  - B. Representative of the County Agricultural Commissioner and USDA
  - C. Representative of the USDA and CDFA
  - D. Representative of the County Agricultural Commissioner and CDFA
9. Inspecting a shipment of tomato plants from Kansas, you would be most apt to find the larvae of the Colorado potato beetle:
- A. In soil about the roots
  - B. On the leaves and stems of the plants
  - C. Boring inside the plants
  - D. Feeding on the roots
10. The County Agricultural Commissioner may refuse to issue a phytosanitary certificate:
- A. At no time
  - B. When the exporter refuses to pay for the inspection services
  - C. Anytime the commodity cannot meet the importing country's entry requirements
  - D. Only when the exporter has a bad reputation
11. A chestnut tree from New York State bearing an origin certificate should be:
- A. Held for Secretary's permit
  - B. Refused admittance and destroyed or shipped out of state
  - C. Treated with Methyl Bromide and released
  - D. Inspected and if findings are negative, released
12. Walnut trees from Iowa, officially certified at origin as coming from an area free from "Brooming" disease of walnuts, should be:

- A. Rejected and destroyed or immediately shipped out of state
  - B. Treated in accordance with the approved treatment contained in the nut tree pests' quarantine
  - C. Held pending the issuance of a permit by the Secretary
  - D. Inspected, and if findings are negative, released
13. On a shipment of unfumigated sweet potato tubers from Texas, you would require a:
- A. Federal "Shipping Point Inspection" certificate
  - B. Certificate signed by an inspector of the Federal Plant Quarantine branch stating that the sweet potatoes were grown, packed and stored in an area free from sweet potato weevil
  - C. Certificate, signed by the official of the state of origin, stating that the sweet potatoes were screened and shipped in new or clean sacks
  - D. Certificate, signed by the official of the state of origin, stating that the sweet potatoes were grown, packed and stored in an area where sweet potato weevil is not known to occur
14. When a known treatment can be safely given, but treatment facilities do not exist in the county of destination, the owner or bailee of an infested shipment should be:
- A. Required to return the shipment to origin or destroy it
  - B. Allowed to recondition the shipment and to retain that portion not heavily infested
  - C. Required to return the shipment to origin after permission is received from official at origin
  - D. Given the option of shipping to the nearest point where material may be safely treated, returning to origin, or destroying
15. When any person that aggrieves an action or order relating to Plant Quarantine issued by a Commissioner, and that person has appealed the order to the Secretary of Food & Agriculture, the Secretary shall hear such appeal within:
- A. 10 days
  - B. 15 days
  - C. 30 days
  - D. 60 days
16. The following commodities are covered in the Chestnut Bark-Oak Wilt Exterior Quarantine except:
- A. Chestnut trees for propagation
  - B. Chestnuts
  - C. Chestnut cuttings or scions
  - D. Chinquapin lumber
17. A shipment of cactus plants originating in a county in New Mexico not infested with Ozonium Root Rot and not accompanied by official certificate should be:
- A. Held for Secretary's permit
  - B. Treated with formaldehyde and released
  - C. Refused admittance and destroyed or shipped out of state
  - D. Inspected and released if inspection findings are negative
18. A commercial shipment of harvested broomcorn from New Mexico should be:
- A. Inspected and released if found free from insects and disease

- B. Released after inspection reveals negative findings and a Cornstalk Borer and Sugarcane Borer Quarantine certificate covers shipment, issued by the origin state
  - C. Certified from the state of origin, evidencing freedom from the European corn borer
  - D. Destroyed as broomcorn is prohibited from New Mexico
19. Citrus seed is admissible to California under provisions of the California Citrus Pests Exterior Quarantine when:
- A. Treated for Citrus Canker
  - B. Under permit issued by the Secretary
  - C. Accompanied by an origin certificate
  - D. Inspected and found free of pests
20. Provisions of the Sweet Potato Weevil Exterior Quarantine restrict all but one of the following. Indicate the exception:
- A. Hothouse grown Sweet Potato draws.
  - B. Sweet Potato tubers from the northern states.
  - C. Morning glory plants from the infested area in Texas.
  - D. Morning glory plants from the non-infested areas in Texas.
21. Oak trees originating in Tennessee should be:
- A. Held for Secretary's permit.
  - B. Refused admittance and destroyed or shipped out of state.
  - C. Treated with Methyl Bromide and released.
  - D. Inspected and released if inspection findings are negative.
22. Which would be considered an approved chamber for conducting quarantine fumigation:
- A. A permanent chamber approved by the California Department of Food & Agriculture.
  - B. A permanent chamber approved by the County Agricultural Commissioner.
  - C. A tarpaulin enclosure certified by a Pest Control Operator. (PCO)
  - D. All of the above.
23. Live specimens of the Red Imported Fire Ant (RIFA) arrive from Alabama. Which of the provisions listed below would be the proper authority to reject them?
- A. The California Department of Food and Agricultural Code (FAC)
  - B. Imported Fire Ant Federal Domestic Quarantine.
  - C. The California Code of Regulations.
  - D. Rules and Regulations of the Secretary.
24. A shipment of Pecan trees without nuts of Texas origin arriving by express from Washington State should be:
- A. Rejected and destroyed or shipped out of state.
  - B. Released if certified or fumigated or hot water treated in Washington State and that the trees were officially certified grown in Texas in Ozonium Root Rot free premises.
  - C. Released if accompanied by a Texas Ozonium Root Rot Certificate.
  - D. Inspected and released if no live pests are found.
25. Under provisions of the Federal Gypsy Moth Quarantine, dormant bare-root apple trees from infested areas:

- A. Are prohibited movement from the quarantine area.
  - B. May be moved from the quarantined area without restriction if visibly free from serious pests.
  - C. Are permitted interstate movement from quarantined area if accompanied by a federal certificate.
  - D. May be moved interstate without restriction under permit from the destination state official.
26. Uncertified Peach trees originating in Pennsylvania should be:
- A. Held pending application for a USDA permit.
  - B. Refused admittance and destroyed or shipped out of state.
  - C. Treated with a 2% formaldehyde solution and released.
  - D. Inspected and if findings are negative, released.
27. California grown Persimmon trees, which are shipped into Oregon and are then reshipped from Oregon into California should be:
- A. Released if found to be free of pests.
  - B. Released if accompanied by a fumigation certificate.
  - C. Rejected regardless of certification.
  - D. Admitted if accompanied by an official Oregon certificate evidencing California origin and reshipment the same season.
28. The authority to make quarantine inspection is found in the:
- A. Border Station Manual of Instructions.
  - B. Quarantine Handbook.
  - C. California Food & Agricultural Code (FAC)
  - D. California Code of Regulations (CCR)
29. Uncertified peach cuttings from Alfalfa County, Oklahoma should be:
- A. Held pending application for a USDA permit.
  - B. Refused admittance.
  - C. Treated with a 2% formaldehyde solution and released.
  - D. Inspected and if inspection findings are negative, released.
30. The Agricultural Commissioner may not accept shipments of Sugar beets from Arizona for processing in his county unless the beets are:
- A. Screened at origin to remove moist clods of soil.
  - B. Accompanied by an Ozonium Root Rot certificate.
  - C. Moving under a USDA compliance agreement.
  - D. Fumigated at origin with Methyl Bromide.
31. Mechanical Cotton picking machines may enter California from the quarantine area:
- A. After inspection if inspection findings are negative.
  - B. If certified as steam cleaned.
  - C. If certified as having been operated only in a noninfested area.
  - D. If accompanied by an official certificate of fumigation.

32. Authority and obligations to make “such inspections as may be necessary” of crops producing seed for export is presented in California Food and Agricultural Code Section 5205. The seed fields are inspected to satisfy the requirements of?
- A. United States Department of Agriculture
  - B. California Department of Food and Agriculture
  - C. County Agricultural Commissioners
  - D. The state or country of destination.
33. Any treatment which may be required by the “Quarantine and pest control” portion of the California Food & Agricultural Code shall be at the expense of the:
- A. County
  - B. CDFA
  - C. Owner
  - D. State of origin
34. Any lot of seed screenings or cleanings from crop seed containing the seed of any pest, if not disposed of as provided in Section 7576 of the Food & Agricultural Code, is subject to seizure on complaint to a court of competent jurisdiction by the:
- A. Unit Chief, Pesticide Enforcement.
  - B. Board of Supervisors.
  - C. District Attorney.
  - D. Secretary of Food & Agriculture, or the Agricultural Commissioner.
35. Under the provisions of the Citrus Pests Quarantine, citrus trees, plants and buds grown in the area under quarantine are:
- A. Admissible if destined for planting in non-citrus producing areas, subject to destination inspection.
  - B. Prohibited entry except for experimental shipments, shipped by or at the request of the USDA.
  - C. Admissible under certificate of origin.
  - D. Prohibited entry unless moving under bond in transit to a California Port for immediate export.
36. Seed screenings are permitted to move without restriction:
- A. Until such time as inspected and found infested.
  - B. When being returned to the premise where the seed originated.
  - C. For the purpose of destruction and processing.
  - D. After processing to render seed of any pest incapable of propagation.
37. A “Host-free District” or “Host-free Period” for the host of a particular pest may be declared by the:
- A. C.A.C.
  - B. California State Governor
  - C. Secretary of CDFA
  - D. California Legislature.
38. The first time a shipment of plant material to Florida is rejected due to European Brown Garden Snail, the shipper is suspended for:
- A. Ten days
  - B. Thirty days

- C. Sixty days
  - D. Six months
39. According to the California Food & Agricultural Code, if there is no Commissioner in the county when agricultural commodities are received, the person transporting, receiving or importing the agricultural commodities shall notify?
- A. Secretary, CDFA
  - B. California State Governor,
  - C. C.A.C. of the adjoining county.
  - D. President, State Board of Agriculture.
40. USDA has established conditions under which plant material may be imported into the United States. Some species of plants are held under Postentry quarantine. The regulatory agencies involved in California are:
- A. County Department of Agriculture and the USDA.
  - B. USDA and the California Department of Food & Agriculture.
  - C. USDA, CDFA, and the County Department of Agriculture.
  - D. None of the above.
41. A shipment of Persimmon trees from Georgia should be:
- A. Released if inspection reveals no live insects.
  - B. Released if defoliated.
  - C. Rejected and destroyed or shipped out of state.
  - D. Released if defoliated and certified fumigated at origin.
42. Insects in the adult stage have:
- A. Four pairs of jointed legs.
  - B. Two definite body regions--head and abdomen.
  - C. One pair of antennae.
  - D. An external skeleton that is often shed with seasonal change.
43. A Federal Phytosanitary Certificate would not be issued on plant material exported to:
- A. Austria.
  - B. Mexico.
  - C. Canada.
  - D. Guam.
44. In California, the responsibility of approving growing grounds for post-entry quarantine (importation of foreign nursery stock and growing under quarantine) rests primarily with:
- A. The Secretary of Food & Agriculture.
  - B. USDA.
  - C. The State Plant Pathologist.
  - D. The County Agricultural Commissioners.
45. The County Agricultural Commissioner shall report to the Secretary of Food & Agriculture on what is being done to quarantine against pests in their county:

- A. Annually
  - B. Biennially
  - C. Monthly
  - D. Weekly
46. Cotton lint, linters and waste, as covered in the Cotton Pest Exterior Quarantine, are admissible under all but one of the following conditions:
- A. Accompanied by a Secretary's permit.
  - B. Treated before shipment to California.
  - C. Covered by an origin certificate.
  - D. When arriving in bales compressed to a density of at least 22 lbs. per cubic foot.
47. Chinquapin nuts are prohibited movement from certain other states into California by the:
- A. Chestnut Bark-Oak Wilt Disease Exterior Quarantine.
  - B. Eastern Filbert Blight Exterior Quarantine.
  - C. Nut Tree Pests Exterior Quarantine.
  - D. Elm Tree Disease Exterior Quarantine.
48. Under the California Food & Agriculture Code, which of the following is specifically given permission, subject to certain provision, to import into California parasitic and predaceous insects for use in control of insect pests:
- A. The Governor of California.
  - B. The California Association of County Agricultural Commissioners.
  - C. The Regents of University of California.
  - D. The United State Conservation Service.
49. Walnut trees without nuts shipped from Idaho to California would be restricted under:
- A. Walnut Pests Exterior quarantine
  - B. Ozonium root rot Exterior Quarantine
  - C. Western Filbert Blight Exterior Quarantine
  - D. Nut tree Pests Exterior Quarantine
50. Quince fruits originating in an area under quarantine for Plum Curculio are:
- A. Prohibited entry into California.
  - B. Admitted if certified as having been grown, stored, packed and shipped from a free area.
  - C. Admitted under certificate of proper cold storage treatment.
  - D. Admitted after inspection if inspection findings are negative.
51. Chestnuts grown in Ohio and shipped to a California destination should be:
- A. Held, and consignee instructed to apply for permit from the Secretary.
  - B. Treated with hot water and released.
  - C. Rejected and destroyed or immediately shipped out of state.
  - D. Inspected and released if in original, unopened containers and findings are negative.

52. On a shipment of Irish potatoes from Idaho contaminated with soil, you would require a:
- A. Federal "Shipping Point Inspection" certificate.
  - B. Certification signed by a county agent, stating that they were grown packed and stored in an area free from Colorado potato beetle.
  - C. Certification signed by an inspector of the Federal Plant Quarantine Branch evidencing storage in an area free from Colorado potato beetle.
  - D. Certification signed by the official of the state of origin stating that the potatoes were grown, packed and stored in an area free from Colorado Potato Beetle.
53. The Plum Curculio Quarantine provides that apples may enter California from the area under quarantine if they are:
- A. Officially certified as having been given a specified "Controlled Atmosphere" storage treatment.
  - B. Individually inspected and found to be free of pests.
  - C. Certified as being produced in orchards that practice conventional pest control.
  - D. Officially certified as fumigated with Ethylene Dibromide.
54. Inspecting a shipment in soil, arriving during the month of March, you would look for Japanese beetle larvae:
- A. In soil about the roots.
  - B. On the leaves and stems of the plants.
  - C. In the stems of the plants.
  - D. Both above and below portions of the plant.
55. A shipment of Irish potatoes from the area infested with Colorado potato beetle should be:
- A. Rejected unless indicated by an origin certificate to be from an area free from Colorado potato beetle
  - B. Released without certification if inspection shows freedom from soil and debris.
  - C. Rejected unless accompanied by a screening certificate.
  - D. Released if accompanied by a shipping point certificate.
56. Plum trees originating in an area defined in the Peach Mosaic Disease Exterior Quarantine as the quarantined area are:
- A. Prohibited entry into California.
  - B. Admitted under a certificate of treatment.
  - C. Admitted under inspection, if inspection findings are negative.
  - D. Admitted under certificate of origin.
57. Chestnuts (nuts) from Italy, arriving in California in original unopened containers, should be:
- A. Rejected and required to be shipped immediately out of state or destroyed.
  - B. Fumigated for Chestnut Weevil regardless of inspection findings.
  - C. Released if inspection for pests is negative.
  - D. Held for certification of treatment at the port of importation by the USDA.
58. Citrus plants from Florida completely defoliated at origin should be:
- A. Refused admittance.
  - B. Examined and, if inspection reveals no pests, released.

- C. Held for a certificate of origin.
  - D. Fumigated with the approved White Fly dosage.
59. Under the quarantine provisions of the Food & Agricultural Code, it is a misdemeanor to:
- A. Move hay containing the mature seed of a secondary noxious weed.
  - B. Move seed containing seed of a primary noxious weed.
  - C. Move unprocessed seed screenings that have not been inspected.
  - D. Move a rail car from out of state with cottonseed.
60. Cottonseed and seed cotton from the infested states or areas listed in the Cotton Pests Exterior Quarantine are:
- A. Admissible when certified by a state official at point of origin.
  - B. Prohibited entry.
  - C. Admitted if accompanied by an official permit or fumigation certificate.
  - D. Released if inspection findings are negative.
61. A shipment of corn plants from the quarantined area should have which of the following certificates to comply with the Federal Domestic Witchweed Quarantine:
- A. Federal Shipping Point inspection certificate
  - B. Certificate signed by the county agent at point of origin
  - C. County fumigation certificate.
  - D. Certificate executed by an inspector of the Plant Protection Division, USDA.
62. What type of inspection is given to vehicles entering California?
- A. The type that reveals all plant material contained in a car.
  - B. The type that reveals most plant material contained in a car.
  - C. The type and kind that does not inconvenience any traveler.
  - D. The type and degree of inspection that is based on the pest hazard present.
63. Cotton lint, linters, and waste as covered in the Cotton Pests Exterior Quarantine are exempt from the certificate requirements when:
- A. Accompanied by a Secretary's permit.
  - B. Fumigated before shipment to California.
  - C. Covered by an origin certificate.
  - D. When arriving in bales compressed to a density of at least 22 lbs. per cubic foot.
64. Fumigation chambers must be certified annually to ensure that they are safe, efficacious, properly calibrated and in proper working order. If the certification of a chamber has expired, which of the following cannot be done:
- A. Issue a Phytosanitary certificate for commodity export.
  - B. Fumigate walnuts to kill insect pests.
  - C. Fumigate raisins to prevent fungus growth.
  - D. All of the above.
65. Organic apples for juicing may enter a county that has an apple maggot ordinance when:

- A. The origin commissioner has inspected the fruit for larvae.
  - B. Accompanied by a certificate issued by an authorized federal/state shipping point inspector.
  - C. The grower is in compliance with the California Organic Foods Act.
  - D. None of the above.
66. The movement of Citrus Nursery Stock within the county of production, is not regulated by the Citrus Tristeza Virus Quarantine in the following county:
- A. Los Angeles
  - B. San Diego
  - C. Fresno
  - D. Merced
67. A shipment is officially “rejected” only:
- A. When returned out of state
  - B. When returned out of state, destroyed, or treated
  - C. When found in violation of any quarantine provision
  - D. When a Quarantine Inspector issues a “Notice of Rejection”, regardless of any other action taken
68. The following document is normally used to authorize the movement of exposed host fruit to a processing facility:
- A. “Certificate of Quarantine Compliance”
  - B. Federal “Certificate”
  - C. Federal “Limited Permit”
  - D. Project “Compliance Agreement”
69. Quarantine inspectors may demand proof of ownership of any plant material.
- A. Whenever an eradication area has been established.
  - B. If in lots of 25 lbs. or more and marked for commercial purposes.
  - C. Only if an inspection warrant has been issued.
  - D. Marked for commercial purposes and the inspector has reasonable cause to presume is in violation of any quarantine provision.
70. Plant products are usually certified as meeting the import requirements of foreign countries using:
- A. Certificate of Quarantine Compliance.
  - B. Letter of credit and condition.
  - C. Phytosanitary certificate.
  - D. Validated Import Permit.
71. The second time a shipment of plant material to Florida is rejected due to European Brown Garden Snail, the shipper is suspended for:
- A. Thirty days
  - B. Sixty days
  - C. Six months
  - D. One year

72. An inspector may, in a summary manner, seize and destroy any host or possible carrier of a pest:
- A. When there is reasonable cause to believe it is infested with a pest
  - B. Following the procedures for abating a public nuisance
  - C. Only when an eradication area has been proclaimed
  - D. Only after giving notice to the person in possession
73. Which one of the following states do not quarantine for European Brown Garden Snail:
- A. Tennessee
  - B. Washington
  - C. Louisiana
  - D. Georgia
74. A shipment of plant material brought into California will have all but one of the following upon it:
- A. Statement of contents
  - B. Name of the country, state or territory where contents were grown
  - C. Declared value of shipment
  - D. Name and address of shipper
75. Which of the following applies to plant material from Hawaii:
- A. Cut flowers are certified with a USDA Limited Permit stamp
  - B. Cut flowers are exempt from certifying requirements
  - C. Nursery stock is certified with a USDA Limited Permit stamp
  - D. Nursery stock is subject to inspection only
76. Under certain conditions a prohibited mammal(s) can be brought into California. A permit(s) from the following must be obtained:
- A. California State Department of Health Services
  - B. California State Department of Fish & Game
  - C. California State Department of Food & Agriculture
  - D. All of the above
77. Which of the following fruits or vegetables are quarantined when originating in Arizona:
- A. Apple
  - B. Citrus
  - C. Corn
  - D. Persimmon
78. A California quarantine is a:
- A. Regulation or proclamation adopted and enforced administratively.
  - B. Guide for operation in enforcement of the California Code of Regulations. (CCR)
  - C. Guide for operation in enforcement of the California Food & Agricultural Code. (FAC)
  - D. Public notice and issued for dissemination of information.

79. When rejecting grain found infested with the seed of a pest, under authority of Section 6341-6344 of the California Food and Agricultural Code (FAC), which of the following would not apply?
- A. Return it to point of shipment within 48 hours
  - B. Given approved treatment under the supervision of the Secretary or the Commissioner, and after such treatment the shipment may be released
  - C. The shipment may be stored for a period of time in an approved place under such conditions as the Secretary or Commissioner may require
  - D. Shipment may be permitted to be stored in an approved manner only when waiting to be returned to point of shipment
80. It is the County Agricultural Inspector's responsibility to certify commodity fumigations. Which of the following are not necessary to successfully complete this task:
- A. Inspect chamber safety to assure respirators, sign checklist and applicators are in proper working order and being used
  - B. Observe and monitor duration, pulp temperature, gas measurement, gas introduction, and gas evacuation
  - C. Monitor worker exposure levels while gas is introduced, while gas is evacuated, and while commodity is being off loaded
  - D. Terminate fumigation if any unsafe work practice or mechanical failure is observed
81. A rose cutting from Japan held at a Post Office and recognized as not inspected should be:
- A. Either returned to origin or destroyed as elected by the shipper
  - B. Immediately destroyed
  - C. Held while a California state rejection notice is issued giving options of having the cutting fumigated, returned to origin, or destroyed
  - D. Called to the attention of the Postmaster and returned to an office where USDA Plant Quarantine inspectors are assigned.
82. Quarantine Proclamations are:
- A. Interior Quarantines
  - B. Exterior Quarantines
  - C. Secretary's Memorandums
  - D. Federal Domestic Quarantines
83. Federal Domestic Quarantines are enforced in California under authority vested in:
- A. Section 6301 of the California Agricultural Code
  - B. Section 2319(b) of the California Political Code
  - C. Section 3151 of the California Administrative Code
  - D. Federal Plant Quarantine Act of 1912 (amended)
84. The California Code of Regulations is a:
- A. Statutory enactment by the State Legislature
  - B. Group of memoranda written by the Governor
  - C. A codified group of administrative rules
  - D. A codified group of plant quarantines only
85. California Plant Quarantines are levied against:

- A. States
- B. Pests
- C. Properties
- D. People

86. In order to become legally effective, a Quarantine Regulation (interior quarantine) must be:

- A. Established by the Secretary and proclaimed by the Governor
- B. Established by the Secretary
- C. Approved by the Agricultural Board
- D. Approved by the Western Plant Board

87. In order to become legally effective, a Quarantine Proclamation (exterior quarantine) must be:

- A. Established by the Secretary and proclaimed by the Governor
- B. Established by the Secretary
- C. Approved by the Agricultural Board
- D. Approved by the Western Plant Board

88. When the Agricultural Code states that the Secretary shall perform an Act, it means:

- A. It is permitted that s/he perform the Act
- B. It is mandatory that s/he perform the Act
- C. It is a moral obligation on her/his part to perform the act
- D. It is up to the Legislature to incorporate the secretary's rulings into the statutes

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90. Any person in whom the enforcement of any provision of the code is vested:

- A. Must see to it that the District Attorney enforces those provisions
- B. Shall act in an advisory capacity to the sheriff
- C. Has the power of a public officer
- D. Has the power of a public officer in the enforcement of the code.

91. Cherry fruit flies overwinter in the:

- A. Larvae stage
- B. Pupae stage
- C. Adult stage
- D. All stages

92. Blueberry maggot is most apt to be intercepted at which stage?

- A. Adult

- B. Pupae
- C. Larvae
- D. Egg

93. Plum curculio is most apt to be intercepted in the:

- A. Adult stage
- B. Pupae stage
- C. Larvae state
- D. Egg stage

94. Pecan leaf case bearer and nut case bearer are most likely to be intercepted on:

- A. Logs
- B. Nuts
- C. Nursery stock
- D. Containers

95. The area under quarantine for the persimmon root borer is:

- A. Southern states only
- B. Eastern states only
- C. All states, districts, and territories of the U.S.
- D. All states east of Texas, Oklahoma, Kansas, Nebraska, North Dakota, and South Dakota

96. Lethal yellowing of palm is caused by:

- A. A virus
- B. An insect vector
- C. Bacteria
- D. Mycoplasma-like organisms

97. Brooming disease of walnut is not known to attack:

- A. English walnut
- B. Butternut
- C. Black walnut
- D. Pecan

98. Japanese plum trees from Tennessee should be:

- A. Held pending application for Secretary's permit
- B. Inspected and, if findings are negative, released
- C. Refused admittance and destroyed or shipped out of state
- D. Passed if certification is in order

99. Almond trees originating in Pennsylvania should be:

- A. Held pending application for Secretary's permit
- B. Refused admittance and destroyed or shipped out of state

- C. Treated with a 2 percent formaldehyde solution and released
- D. Inspected and, if findings are negative, released

100. Shipment of bare-rooted peach nursery stock, originating in the State of Oregon and unaccompanied by an origin certificate should be:

- A. Held pending application for Secretary's permit
- B. Refused admittance and shipped out of the state
- C. Treated with a 2 percent formaldehyde solution and released
- D. Inspected and, if findings are negative, released

101. You would pass a shipment of peach trees from Georgia if it were accompanied by a?

- A. Nursery inspection certificate
- B. "Shipping Point Inspection" certificate
- C. Certificate attesting to approved treatment
- D. Certificate signed by the state of origin official that they were produced in an area free from peach rosette

102. Which one of the following states is not under quarantine for Peach Rosette disease?

- A. Arkansas
- B. Oklahoma
- C. Texas
- D. Tennessee

103. Marianna plum trees from South Carolina should be

- A. Held pending application for Secretary's permit
- B. Inspected and, if findings are negative, released
- C. Refused admittance and destroyed or shipped out of state
- D. Passed if certification is in order

104. Which one of the following is most descriptive of the area quarantined for Chestnut Bark disease?

- A. Pacific Northwest
- B. All states and districts of the U.S. except Arizona
- C. The southern states
- D. Atlantic seaboard states

105. Golden Nematode primarily attacks which of the following:

- A. Tomatoes, squash, potatoes
- B. Potatoes and squash
- C. Potatoes and tomatoes
- D. Tomatoes and sweet potatoes

106. Which one of the following would be refused entry under the Ozonium Root Rot quarantine?

- A. Nursery stock free from roots and soil
- B. Mangels and sugar beets

- C. Aquatic plants
- D. Orchid plants growing in osmunda fiber

107. Which one of the following states is not under quarantine for Cedar-Apple Rust?

- A. Alaska
- B. New York
- C. Oklahoma
- D. Wyoming

108. Under the Black Stem Rust quarantine which one of the following is not a regulated product:

- A. Mahonia
- B. Mahoberberis
- C. Mahonia cuttings for decorative purposes
- D. Berberis

109. During the inspection of an automobile trunk the driver declares two Chestnut trees from Georgia. A certificate stating that the trees are from an area free from Chestnut Bark disease. You should:

- A. Inspect and pass if findings are negative
- B. Reject and destroy or ship out of state
- C. Fumigate with methyl bromide and pass
- D. Tell the tourist he should have known better

110. Which one of the following is most descriptive of the area under quarantine for Oak Wilt:

- A. All states east of the Rocky Mountains
- B. All states and districts of the U.S. except Arizona
- C. Mid-western states
- D. Eastern states

111. Before writing a phytosanitary certificate on a commodity, you should refer to:

- A. The Plant Quarantine Manual
- B. Shipping Point Guide
- C. Q.C. Circular
- D. Export Certification manual or Excerpt

112. To meet the requirements for an approved feed grain mill, the size of the screens used for grinding can be no larger than:

- A. Number 3 screen
- B. Number 5 screen
- C. Number 1 screen
- D. No requirements

113. Which of the following would be least apt to carry the Cedar-Apple Rust:

- A. Junipers
- B. Apple trees

- C. Apple tree cuttings
- D. Fresh fruits apple fruits from a commercial packinghouse

114. Chestnuts grown in China and mailed in the original unopened container from Canada, should be:

- A. Held for Secretary's permit
- B. Refused admittance and destroyed or shipped out of state
- C. Treated with methyl bromide and released
- D. Inspected and released if inspection findings are negative

115. The Gypsy Moth remains in the egg stage:

- A. Nine months of the year
- B. Two months of the year
- C. Four months of the year
- D. Six months of the year

116. The most likely means of introduction of the Gypsy Moth would be in the:

- A. Egg masses attached to outdoor furniture
- B. Larvae stage on plants
- C. Pupae stage in the soil
- D. Adult stage on indoor decorative greens

117. Which one of the following would not be quarantined on account of Oak Wilt:

- A. Chestnut tree
- B. Chinquapin tree
- C. Acorns
- D. Tanbark oak tree

118. When writing a phytosanitary certificate you should make sure the commodity meets all of the requirements as listed on:

- A. Letter of credit
- B. Import permit
- C. Letter from inspector
- D. Letter from export broker

119. The controlling unit to see that the grower keeps all conditions of the post entry agreement is:

- A. County Agricultural Commissioner
- B. State Pest Exclusion
- C. State Plant Pathologist
- D. USDA

120. European corn borer over winter in which life stage?

- A. Egg
- B. Larvae
- C. Pupae

D. Adult

121. Most interceptions are normally made of live European corn borer in the month of:

- A. January
- B. October
- C. June
- D. August

122. Most interceptions of European corn borer are made in which life stage?

- A. Egg
- B. Larvae
- C. Pupae
- D. Adult

123. European Corn Borer has a host range of:

- A. Over 200 plants.
- B. Sorghum.
- C. Over 30 plants.
- D. Sorghum, polygonum, and plants of the aster family.

124. Camelthorn would most likely be a contaminant of which crop seed:

- A. Corn
- B. Tomato
- C. Alfalfa
- D. Artichoke

125. Which is prohibited from importation by California Food & Ag Code regulations:

- A. European Ferret
- B. Gerbil
- C. Mongoose
- D. Coatimundi

126. Halogeton (*Halogeton glomeratus*) has been found infesting which general area of California:

- A. Northwestern coastal
- B. Central Valley
- C. Eastern desert
- D. Southern coastal

127. Which of the following is prohibited entry into California under provisions of CCR 3254:

- A. Cotton plants
- B. Seed cotton
- C. Cottonseed
- D. Linters

128. A "standard density" bale of cotton will be compressed to over:

- A. 13 lbs. density
- B. 18 lbs. density
- C. 22 lbs. density
- D. 28 lbs. density

129. A "high density" (HD) bale of cotton will be compressed to over:

- A. 13 lbs. density
- B. 18 lbs. density
- C. 22 lbs. density
- D. 28 lbs. density

130. A shipment of standard density baled cotton should be:

- A. Accompanied by Secretary's permit
- B. Accompanied by USDA fumigation certificate
- C. Inspected and released if inspection findings are negative
- D. Rejected and shipped out of state

131. A load of cottonseed from the Pink Bollworm regulated area:

- A. May enter by rail only
- B. May not enter California
- C. May enter when accompanied by an official certificate
- D. May enter without restrictions if in new clean sacks

132. Which member of the Sturnidae family can be imported into California without a permit?

- A. European starling
- B. Hill mynah
- C. Crested mynah
- D. Common mynah

133. The Japanese beetle overwinter in:

- A. All stages
- B. Larvae stage
- C. Pupae stage
- D. Adult stage

134. The Colorado potato beetle is a native of:

- A. France
- B. South America
- C. Germany
- D. United States

135. The Sweet Potato Weevil is not known to attack:

- A. Sweet Potato plants
- B. Sweet Potato tubers
- C. Morning Glory plants
- D. Irish Potato tubers

136. The Japanese beetle feeds on:

- A. Very few plants
- B. Fruit only
- C. More than 250 hosts
- D. Roots only

137. The Sweet Potato Weevil overwinter in the:

- A. Egg stage
- B. Larvae stage
- C. Pupae stage
- D. All stages

138. The Colorado potato beetle over winter in:

- A. All stages.
- B. Larvae stage.
- C. Pupae stage.
- D. Adult stage.

139. The Cereal Leaf Beetle quarantine CCR 3277 does not restrict movement of one of the following:

- A. Shelled corn
- B. Barley
- C. Wheat
- D. Hay

140. What was the first plant quarantine to be established in California?

- A. One on citrus for citrus pests
- B. Grape Phylloxera quarantine
- C. Cotton pests quarantine
- D. European corn borer quarantine

141. Japanese Beetle is known to attack:

- A. Members of at least three or more plant families
- B. Certain plants of the *Solanum* genus only
- C. Plants belonging to the genus *Vicia* only
- D. *Ipomoeas* plants only

142. Piranha belongs to the class:

- A. Mammalia
- B. Osteichthyes
- C. Amphibia
- D. Reptilia

143. Sweet Potato Weevil is known to attack:

- A. Members of at least three or more plant families
- B. Deciduous fruits only
- C. Certain *Ipomoeas* plants only
- D. Certain plants of the *Solanum* genus

144. Which of the following agencies is responsible for publishing the list of animals prohibited from importation into California?

- A. U.S. Bureau of Sport Fisheries and Wildlife
- B. California Department of Food and Agriculture
- C. U.S. Public Health Service
- D. California Department of Fish and Game

145. A shipment of plants from Maryland established in soil should be accompanied by a:

- A. Federal "Shipping Point Inspection" certificate
- B. Certificate signed by the county agent at point of origin
- C. Certificate executed by an inspector of USDAAPHIS that the plants were grown, packed, and stored in an area free from Japanese beetle
- D. Certificate signed by the state official that the plants were grown, packed, and stored in an area free from Japanese beetle

146. The Citrus Pests exterior quarantine names as its quarantined area:

- A. All states east of the Rocky Mountains
- B. All states in the U.S.
- C. All states, districts, and territories of the U.S.
- D. All states, districts, and territories of the U.S. except the State of Arizona

147. Phytosanitary certificates are issued as a:

- A. Condition of entry into a foreign country
- B. Condition of cleanliness required by California
- C. Requirement of the U.S. Government
- D. Guarantee to get the commodity into the foreign country

148. Phytosanitary certificates should not be issued for:

- A. Canned fruit, vegetables, or products thereof
- B. Prepared condiments
- C. Coffee
- D. All of the above

149. The greatest percentage of exotic pests enter California via:

- A. Private vehicles
- B. Airfreight
- C. Trucks
- D. Ships

150. Khapra Beetle does its damage in the:

- A. All stages
- B. Adult stage
- C. Larvae stage
- D. Pupae stage

151. Which one of the following states is not known to be infested with the Cereal Leaf Beetle?

- A. Michigan
- B. Colorado
- C. Tennessee
- D. Kansas

152. *Bufo marinus*, Marine Toad is prohibited in California. If found at a pet store who would be responsible for confiscating it:

- A. County Agricultural Commissioner
- B. County Agricultural Inspector
- C. State Plant Quarantine Officer
- D. Department of Fish and Game

153. The Red-Whiskered Bulbul feeds primarily on:

- A. Citrus and soft fruits
- B. Grain
- C. Leafy vegetables
- D. Eggs of other birds

154. Witchweed is commonly known as:

- A. An Insect
- B. A Fungus disease
- C. A Nematode
- D. A Parasite

155. Khapra Beetle overwinter in:

- A. All stages.
- B. The larvae stage.
- C. The pupae stage.
- D. The adult stage.

156. Which of the following commodities is most likely to carry Khapra Beetle?

- A. Baled rags
- B. Cotton lint
- C. Fresh harvested grain
- D. Used grain sacks

157. The inspection of the growing plants while under post entry is the responsibility of:

- A. County Agricultural Commissioner
- B. Pest Detection/Emergency Projects
- C. State Plant Pathologist
- D. USDA

158. Papaya fruit from Mexico is:

- A. Prohibited
- B. Subject to inspection only
- C. Fumigated under USDA supervision
- D. Admissible to East Coast ports only

159. Khapra Beetle has many unusual characteristics, one of which is:

- A. Survival under water
- B. Resisting all eradication attempts
- C. Crawling through brick walls
- D. Spreading great distances by natural flight

160. Which one of the following applies to Witchweed:

- A. Native of the U.S.
- B. Recently introduced into the U.S.
- C. Attacks plants other than corn and related grasses.
- D. Needs an alternative host in order to complete its life cycle.

161. Red Imported Fire Ant (RIFA) is which of the following:

- A. Native insect
- B. Imported from South America
- C. Imported from Africa
- D. Imported from the Mediterranean area

162. Florida restricts the movement of plants into their state because of:

- A. Burrowing nematode
- B. Giant African snail
- C. Various virus diseases
- D. Brown Garden Snail

163. Before the final approval of a feed mill is made, you should:

- A. Check the mill operation for six hours to make sure everything is working properly
- B. Hold a training meeting with mill personnel
- C. Approve the mill if all equipment is in good condition
- D. Send to the Sacramento Seed Laboratory, a sample of finished mill product for germination testing

164. Which of the following causes Spreading Decline?

- A. Insect with a complete life cycle
- B. A saprophytic disease
- C. Endoparasitic nematode
- D. Parasitic seed plant

165. Which of the following causes Rapid Decline?

- A. Burrowing nematode
- B. Citrus Canker
- C. Southern root rot
- D. Tristeza Virus

166. Burrowing Nematode attacks:

- A. Citrus trees only
- B. Avocado trees only
- C. Deciduous trees only
- D. Ornamental plants, citrus and avocado trees

167. Southern Cornstalk Borer belongs to the order:

- A. Homoptera
- B. Hymenoptera
- C. Lepidoptera
- D. Coleoptera

168. The Southern Cornstalk Borer and Southwestern Corn Borer overwinter as:

- A. Adults in soil
- B. Full-grown larvae in old corn stalks
- C. Pupae in the soil
- D. Egg masses on rocks, boards and debris

169. In order to establish and maintain agricultural inspection in a USPS Processing & Distribution Center (P&DC) (formerly known as a Sectional Center), the Plant Manager is required to furnish:

- A. Help to open and rewrap packages
- B. Tables or benches, lighting and other equipment for inspecting plant materials
- C. Suitable space to perform the inspections
- D. Not required to furnish anything

170. A commercial shipment of harvested Broomcorn from Arizona should be:

- A. Inspected and released if found free from insects and diseases
- B. Released after inspection reveals negative findings and shipment is covered by a Cornstalk Borers and Sugarcane borer quarantine certificate issued by the origin state
- C. Certificate from the state or origin affirming that such produce is a product of said state wherein no European corn borer is known to exist
- D. Certificate issued by the USDA, evidencing shipment free from European corn borer

171. Which one of the following would not be under quarantine for the Southwestern Corn Borer?

- A. Corn on the cob
- B. Corncobs
- C. Corn stalks
- D. Broomcorn

172. The Walnut Husk Fly overwinter in which of the following stages:

- A. Egg
- B. Larva
- C. Pupa
- D. Adult

173. Butternut Curculio is:

- A. An insect
- B. Fungus disease
- C. Nematode
- D. Mite

174. During inspection of host material the Black Walnut Curculio would be most apt to be found in?

- A. Soil
- B. Husk of the nut
- C. Nut itself
- D. Tender shoots

175. Black Walnut Curculio overwinters in what stage?

- A. Egg
- B. Larvae
- C. Pupae
- D. Adult

176. To find the name of the county in which a city is, in any state is located, it would be better to consult:

- A. A road map
- B. An atlas
- C. A Postal Guide
- D. The list of county commissioners

177. Primates: all genera of monkeys and apes must have a permit issued by one of the following in order to be imported into California:
- A. Department of Fish and Game
  - B. Department of Food and Agriculture
  - C. Zoological garden
  - D. State Department of Public Health
178. You are inspecting plant material at a USPS Processing & Distribution Center (P&DC) and find a foreign parcel containing plant material. There is no evidence that the contents have been inspected and released by the USDA. You should:
- A. Inspect and release if findings are negative
  - B. Hold and notify the Pest Exclusion Unit in Sacramento
  - C. Reject the shipment and return to shipper
  - D. Forward the package to the nearest USDA field office
179. In which of the following would a commissioner have possible need for hold notice action?
- A. Any property found infested with a pest of common occurrence
  - B. Fields of grain infested with a "A" rated weed where there is a need to control the movement of the infested grain from the field
  - C. A shipment of plants is found in violation of the California Exterior Quarantine
  - D. All of the above
180. A laboratory desiring a continuing permit should make application by letter through their county agricultural commissioner to Pest Exclusion. The initial inspection for approval of the laboratory will be made by:
- A. Representatives of the County Agricultural Commissioner, USDA, and Pest Exclusion.
  - B. Representatives of the County Agricultural Commissioner and USDA.
  - C. Representatives of the USDA and Pest Exclusion.
  - D. Representatives of the County Agricultural Commissioner and Pest Exclusion.
181. The following states are quarantined for Colorado potato beetle quarantine except:
- A. Nevada
  - B. Texas
  - C. Florida
  - D. Colorado
182. Sugarcane gummosis is caused by?
- A. Virus
  - B. Fungus
  - C. Insect
  - D. Bacterium
183. Gypsy moth overwinters in what stage:
- A. Egg
  - B. Larva

- C. Pupa
- D. Adult

184. Which of the following is not exempt under the West Indian sugarcane root borer quarantine?

- A. Sand
- B. Privately owned indoor house plants
- C. Seed
- D. Carrots, if free from soil

185. Ozonium root rot is caused by a:

- A. Virus
- B. Bacteria
- C. Nematode
- D. Fungus

186. Which of the following weeds would be of concern during the inspection of fish a boat from Florida?

- A. Witchweed
- B. Hydrilla
- C. Quackgrass
- D. Elodea

187. Which of the following is an "A" rated weed?

- A. Field bindweed
- B. Canada thistle
- C. Russian knapweed
- D. Perennial snowthistle

188. Which of the following is a reason that an animal would be restricted under Section 671, Title 14 of the California Code of Regulations?

- A. Welfare of the animal
- B. Health concerns
- C. Breeding regulations
- D. Detriment to the flora and/or fauna

189. When entering from an area infested with red imported fire ant, which of the following articles would not require certification?

- A. Soil
- B. Houseplants frown in the house and not for sale
- C. Grass sod
- D. Plants with roots and soils

190. Mediterranean fruit fly attacks:

- A. Citrus and pome fruits only

- B. Citrus and mangos only
- C. More than 200 fruit and vegetable crops
- D. Only crops which are grown in the Mediterranean region

191. Plum curculio is most likely to be introduced at what stage?

- A. Adult
- B. Pupa
- C. Egg
- D. All stages

192. Which of the following is most descriptive of Chrysanthemum White Rust Interior Quarantine?

- A. Several Southern California Counties
- B. The Sierra Nevada area
- C. Several Monterey Bay area counties
- D. Most of the Sacramento Valley

193. Ozonium Root Rot?

- A. Louisiana
- B. Colorado
- C. Arkansas
- D. Texas

194. Nut Tree Casebearers overwinter in which life stage?

- A. Egg
- B. Larva
- C. Pupa
- D. Adult

195. Which of the following commodities is not restricted by the Nut Tree Pest Exterior Quarantine?

- A. Pecan trees
- B. Walnut trees
- C. Walnut budwood
- D. Pecan nuts

196. Cereal Leaf Beetle has how many generations per year?

- A. One
- B. Two
- C. Four
- D. Variable, depending on the weather

197. Red Suture is a disease of?

- A. Apple trees
- B. Peach trees

- C. Strawberry plants
- D. Citrus

198. *Anastrepha ludens* is the scientific name of?

- A. Mediterranean Fruit Fly
- B. Mexican Fruit Fly
- C. Oriental Fruit Fly
- D. Melon Fruit Fly

199. Hydrilla is a(n)

- A. Aquatic weed
- B. Fungal disease
- C. Insect pest
- D. Nematode

200. The following commodities are covered by the Federal Domestic Pink Bollworm quarantine, except:

- A. Cotton seed
- B. Hollyhock
- C. Okra
- D. Kenaf

201. European Pine Shoot Moth has how many generations per year?

- A. One
- B. Two
- C. Four
- D. Variable, depending on the weather