1. **Domain experts’ information**

Table 1: Domain experts involved in the evaluation.

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| --- | --- | --- | --- | --- | --- |
| ***No.*** | ***Name*** | ***Gender*** | ***Specialize subject*** | ***Average years of experience*** | ***Affiliation*** |
| **1** | Dr. Abdulrahman S. Aldawood | Male | Entomologist | More than 25 years | Professor at King Saud University |
| **2** | Dr. Kamal A. M. Abo-Elyousr | Male | Pathologist | More than 25 years | Professor at King Abdulaziz University |
| **3** | Dr. Khalid Ali Asiry, | Male | Entomologist | More than 25 years | Professor at King Abdulaziz University |
| **4** | Dr. Khalid A. Alhudaib | Male | Pathologist | More than 25 years | Professor at King Faisal University |
| **5** | Dr. Abdulaziz Dakhel Allah Althbyani | Male | Entomologist | More than 10 years | Associate Professor at University of Tabuk |
| **6** | Dr. Hamadttu Elshafie | Male | Entomologist | More than 5 years | Associate Professor at Date Palm Research Center of Excellence, King Faisal University |
| **7** | Dr. Mohammed Omarn | Male | Pathologist | More than 5 years | Graduated from King Abdulaziz University |
| **8** | Mr. Najeeb Almasoudi | Male | Pathologist | More than 5 years | PhD student at King Abdulaziz University |
| **9** | Mr. Mueed Ali Sauliman | Male | Entomologist | More than 5 years | PhD student at King Abdulaziz University |
| **10** | Mrs. Noura S. Algrani | Female | Entomologist | More than 5 years | PhD student at King Abdulaziz University |
| **11** | Mr. Abdulla Talal Alghanmi | Male | Entomologist | More than 5 years | MSc from King Abdulaziz University |

1. **Competency Questions (CQs) formulated for AgrODSS evaluation**

Table 2: CQs with corresponding SPARQL queries and the results obtained by the AgrODSS system.

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| --- | --- | --- | --- |
| **Category** | **CQs** | **SPARQL query** | **Answer by system** |
| **Disease/ Pest** | **CQ1:** What are the following symptoms indicate?   1. Ejection of chewed up fibers from wounds on palm trunk. 2. Palm leaves and offshoot become yellow. | SELECT DISTINCT ?Problem ?Agent  WHERE { ?Problem dp:influence dp:Date\_Palm. ?Problem dp:has\_Symptom dp:Ejection\_Of\_Chewed\_Up\_Fibers\_From\_Wounds; dp:has\_Symptom dp:Leaf\_Become\_Yellow; dp:has\_Symptom dp:Offshoot\_Become\_Yellow; dp:is\_Caused\_By ?Agent.  ?Agent dp:has\_Scientific\_name ?Sname} | **Problem** =   1. Red palm weevil damage |
| **CQ2:** What are the following symptoms indicate?   1. Cylindrical oblique holes appear on the palm trunk and leaf base. 2. Brown sticky material at holes on palm trunk. | SELECT DISTINCT ?Problem ?Sname  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Cylindrical\_Oblique\_Holes\_On\_Trunk\_And\_Leaf\_Base; dp:has\_Symptom dp:Brown\_Sticky\_Material\_At\_Holes\_On\_Trunk;  dp:is\_Caused\_By ?Agent. ?Agent dp:has\_Scientific\_name ?Sname} | **Problem** =   1. Longhorn date palm stem borer damage. |
| **CQ3:** What is the following symptom indicate?   1. Dark brown stripe appears on the dorsal side of rachis from the base to the top. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom ?Symptom.  ?Symptom dp:is\_Appear\_On dp:Leaf\_Rachis.  FILTER (?Symptom = dp:Dark\_Brown\_Stripe\_On\_Leaf\_Rachis)} | **Problem** =   1. Bayoud disease 2. Fusarium wilt disease 3. Reddish brown parallel spot disease. |
| **CQ4:** What are the following symptom indicate?   1. Brown or rusty spots appear on the external surface of unopening inflorescence. 2. Inflorescences covered with white powdery. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Brown\_Or\_Rusty\_Spots;  dp:has\_Symptom dp:Inflorescences\_Covered\_With\_White\_Powdery} | **Problem** =   1. Inflorescence rot disease. |
| **CQ5:** What are the following symptom indicate?   1. Longitudinal tunnels and holes on fruit bunch. 2. Spikelets tips become light gray to silver. 3. Holes on unopened spathe. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Longitudinal\_Tunnels\_And\_Holes\_On\_Fruit\_Bunch;  dp:has\_Symptom dp:Spikelets\_Tips\_Become\_Light\_Gray\_To\_Silver;  dp:has\_Symptom dp:Holes\_On\_Unopened\_Spathe.} | **Problem** =   1. Greater date moth damage. |
| **CQ6:** What are the following symptom indicate?   1. Leaflet becomes light green or yellowish green. 2. Oozing of honeydew on leaflet. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Leaflet\_Become\_Light\_Green\_Or\_Yellowish\_Green;  dp:has\_Symptom dp:Oozing\_Of\_Honeydew\_On\_Leaflet.} | **Problem** =   1. Date palm dubas bug damage. |
| **CQ7:** What are the following symptom indicate?   1. A yellowish-brown stripe on leaf base and leaf rachis. 2. Leaf base rot. 3. Death of offshoot. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Yellowish\_Brown\_Stripe\_On\_Leaf\_Base\_And\_Leaf\_Rachis;  dp:has\_Symptom dp:Death\_Of\_Offshoot;  dp:has\_Symptom dp:Leaf\_Base\_Rot} | **Problem** =   1. Diplodia leaf-base disease. |
| **CQ8:** What are the following symptom indicate?   1. Deformation of Leaves 2. Brown spots with a light center and dark edge surrounded by a yellow halo on the leaflet. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Deformation\_Of\_Leaves ;  dp:has\_Symptom dp:Brown\_Spot\_With\_Light\_Center\_And\_Dark\_Edge\_Surrounded\_By\_Yellow\_Halo\_On\_Leaflet} | **Problem** =   1. Anthracnose disease. |
| **CQ9:** What are the following symptom indicate?   1. Pale spots surrounded by a brown ring on leaflet. 2. Circular or irregular scorched shot holes on the leaf edge. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Pale\_Spot\_Surrounded\_By\_Brown\_Ring\_On\_Leaflet;  dp:has\_Symptom dp:Circular\_Or\_Irregular\_Scorched\_Shot\_Holes\_On\_Leaf\_Edge.} | **Problem** =   1. Shole hole disease of date palm. |
| **CQ10:** What are the following symptom indicate?   1. Sticky material at entrance holes on leaf rachis. 2. Tunnels at leaf rachis. 3. Leaf becomes powdery. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Sticky\_Material\_At\_Entrance\_Holes\_On\_Leaf\_Rachis;  dp:has\_Symptom dp:Tunnels\_At\_Leaf\_Rachis;  dp:has\_Symptom dp:Leaf\_Become\_Powdery.} | **Problem** =   1. Palm frond borer damage. |
| **CQ11:** What are the following symptom indicate?   1. Death of leaflet from the tip backwards. 2. Malformation and twisting of leaf. 3. Leaf with a scorched or charcoal-like appearance. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Malformation\_And\_Twisting\_Of\_Leaf;  dp:has\_Symptom dp:Death\_Of\_Leaflet\_From\_the\_Tip\_Backwards;  dp:has\_Symptom dp:Leaf\_With\_Scorched\_Or\_Charcoal\_Like\_\_Appearance.} | **Problem** =   1. Black scorch disease. |
| **CQ12:** What are the following symptom indicate?   1. Subepidermal spots on both sides of the leaflet and rachis. 2. Yellow pustules that turn black on lower old leaf. 3. Drying of leaf. | SELECT DISTINCT ?Problem  WHERE {?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Subepidermal\_Spots\_On\_Both\_sides\_Of\_Leaflet\_and\_Rachis;  dp:has\_Symptom dp:Yellow\_Pustules\_That\_Turn\_Black\_On\_Lower\_Old\_Leaf ;  dp:has\_Symptom dp:Drying\_Of\_Leaf.} | **Problem** =   1. Graphiola leaf spot disease. |
| **CQ13:** What are the following symptom indicate?   1. Leaflet tip and edges become burnt grey. 2. Small yellow or brown circular spots on leaflet and leaf rachis. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Leaflet\_Tip\_And\_Edges\_Become\_Burnt\_Grey;  dp:has\_Symptom dp:Small\_Yellow\_Or\_Brown\_Circular\_Spot\_On\_Leaflet\_And\_Leaf\_Rachis.} | **Problem** =   1. Pestalotia leaf spot disease. |
| **CQ14:** What are the following symptom indicate?   1. Small holes like shotgun bullets on trunk and leaf base. 2. Ejection of wooden sawdust from holes at leaf base or trunk. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Small\_Holes\_Like\_Shotgun\_Bullets\_On\_Trunk\_And\_Leaf\_Base;  dp:has\_Symptom dp:Ejection\_Of\_Wooden\_Sawdust\_From\_Holes\_At\_Leaf\_Base\_Or\_Trunk.} | **Problem** =   1. Bark beetle damage. |
| **CQ15:** What are the following symptom indicate?   1. Small and dried fruit hanging by silken threads. 2. Dropped fruit with holes and silky remain close to fruit cap. 3. Fruit becomes dark red. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Small\_Dried\_Fruit\_Hanging\_By\_Silken\_Threads;  dp:has\_Symptom dp:Fruit\_Becomes\_Dark\_Red;  dp:has\_Symptom dp:Dropped\_Fruit\_With\_Holes\_And\_Silky\_Remain\_Close\_To\_Fruit\_Cap.} | **Problem** =   1. Lesser date moth damage. |
| **CQ16:** What are the following symptom indicate?   1. Deep tunnels on fruit stalk. 2. Superficial and deep tunnels on green leaves. 3. Malformation and twisting of offshoot leaves. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Deep\_Tunnels\_On\_Fruit\_Stalk;  dp:has\_Symptom dp:Malformation\_And\_Twisting\_Of\_Offshoot\_Leaves;  dp:has\_Symptom dp:Superficial\_And\_Deep\_Tunnels\_On\_Green\_Leaf.} | **Problem** =   1. Fruit stalk borer damage. |
| **CQ17:** What are the following symptom indicate?   1. Wilting on one side of leaf. 2. Dark brown stripe on leaf rachis. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Wilting\_On\_One\_Side\_Of\_Leaf;  dp:has\_Symptom dp:Dark\_Brown\_Stripe\_On\_Leaf\_Rachis.} | **Problem** =   1. Bayoud disease. 2. Fusarium wilt disease. |
| **CQ18:** What are the following symptom indicate?   1. Small parallel reddish-brown spots on leaf. 2. Dark brown stripe appears on the dorsal side of rachis. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Small\_Parallel\_Reddish\_Brown\_Spot\_On\_Leaf;  dp:has\_Symptom dp:Dark\_Brown\_Stripe\_On\_Leaf\_Rachis.} | **Problem** =   1. Reddish brown parallel spot disease. |
| **CQ19:** What are the following symptom indicate?   1. Small holes below of inflorescence spathe. 2. Inflorescences become devoid of flowers and fruits. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Small\_Holes\_Below\_Of\_Inflorescence\_Spathe;  dp:has\_Symptom dp:Inflorescences\_Become\_Devoid\_Of\_Flowers\_And\_Fruits.} | **Problem** =   1. Date palm inflorescence weevil damage. |
| **CQ20:** What are the following symptom indicate?   1. Oozing of honeydew on leaflet. 2. Deformation and curl of fruit. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Oozing\_Of\_Honeydew\_On\_Leaflet;  dp:has\_Symptom dp:Deformation\_And\_Curl\_Of\_Fruit .} | **Problem** =   1. Mealy bugs damage. |
| **CQ21:** What are the following symptom indicate?   1. Fruit stalk, leaf rachis, and leaflet become light green with brown spots. 2. Deformation and curl of fruit. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Palm\_Tissue\_Become\_Light\_Green\_With\_Brown\_Spots;  dp:has\_Symptom dp:Deformation\_And\_Curl\_Of\_Fruit .} | **Problem** =   1. Parlatoria date scale damage. |
| **CQ22:** What are the following symptom indicate?   1. Vertical tunnels at the root zone and offshoots base. 2. Soil tunnels on leaf base. 3. Death of newly planted offshoots. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Vertical\_Tunnels\_At\_Root\_Zone\_And\_Offshoots\_Base;  dp:has\_Symptom dp:Death\_Of\_Newly\_Planted\_Offshoots;  dp:has\_Symptom dp:Soil\_Tunnels\_On\_Leaf\_Base .} | **Problem** =   1. Termites damage. |
| **CQ23:** What are the following symptom indicate?   1. Silken webbings around fruits and spikelets that collect dust. 2. Fruit skin becomes leathery with a cork texture. 3. Fruits become reddish brown. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Silken\_Webbings\_Around\_Fruits\_And\_Spikelet\_That\_Collect\_Dust;  dp:has\_Symptom dp:Fruit\_Skin\_Becomes\_Leathery\_With\_Cork\_Texture;  dp:has\_Symptom dp:Fruits\_Become\_Reddish\_Brown.} | **Problem** =   1. Old world date mite damage. |
| **CQ24:** What are the following symptom indicate?   1. Light brown spots with dark brown edges on the leaflet and leaf rachis. 2. Dark gray spots with reddish-to-brown edges on both surfaces of the leaflet. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Light\_Brown\_Spot\_With\_Dark\_Brown\_Edges\_On\_Leaflet;  dp:has\_Symptom dp:Dark\_Gray\_Spot\_With\_Reddish\_To\_Brown\_Edges.} | **Problem** =   1. Rectangular pale brown spot disease. |
| **CQ25:** What is the following symptom indicate?   1. Black sooty rot appears on the leaflet. | SELECT DISTINCT ?Problem  WHERE { ?Problem dp:influence dp:Date\_Palm.  ?Problem dp:has\_Symptom dp:Black\_Sooty\_Rot.} | **Problem** =   1. Date palm Dubas bug damage. 2. Mealy bugs damage. |
| **Control Method** | **CQ1:** What is the suitable chemical control of (*Red palm weevil*)? | SELECT DISTINCT ?SName ?Chemical\_Control  WHERE { ?Pest dp:is\_Parasite\_Of dp:Date\_Palm.  {?Pest dp:has\_Common\_Name ?SName. FILTER (regex(str(?SName),"Red palm weevil","i")) }  ?Pest dp:has\_Chemical\_Control ?Chemical\_Control} | **Chemical Control =**   1. Cypermethrin 2. Deltamethrin 3. Methidathion |
| **CQ2:** What is the suitable chemical control of (*Black scorch disease of date palm*) | SELECT DISTINCT ?Disease ?Chemical\_Control  WHERE { ?Disease dp:is\_Disease\_Of dp:Date\_Palm.  ?Disease dp:has\_Chemical\_Control ?Chemical\_Control.  FILTER(?Disease =dp:Black\_Scorch\_Disease)} | **Chemical Control =**   1. Thiophanate Methyl 2. Metalaxyl-M 3. Bordeaux Mixture 4. Mancozeb 5. Copper Oxychloride |
| **CQ3**: What is the suitable biological control of a (*Palm frond borer damage*)? | SELECT DISTINCT ?Damage ?Biological\_Control  WHERE { ?Damage dp:is\_Pest\_Damage\_Of dp:Date\_Palm.  ?Damage dp:has\_Biological\_Control ?Biological\_Control .  FILTER(?Damage =dp:Palm\_Frond\_Borer\_Damage)} | **Biological Control =**   1. Metarhizium anisopliae 2. Beauveria bassiana 3. Rhabdits blumi |
| **CQ4**: What is the suitable biological control of (*Red palm weevil*)? | SELECT DISTINCT ?SName ?Biological\_Control  WHERE { ?Pest dp:is\_Pest\_Of dp:Date\_Palm.  {?Pest dp:has\_Common\_Name ?SName. FILTER (regex(str(?SName),"Red palm weevil","i")) }  ?Pest dp:has\_Biological\_Control ?Biological\_Control} | **Biological Control =**   1. Chelisoches morio f 2. Platymeris laevicollis distant 3. Steinernema feltiae 4. Steinernema carpocapsae 5. Tetrapholypus rhynchophori 6. Beauveria bassiana 7. Scolia erratica smith 8. Heterorhabditis spp 9. Sarcophaga fuscicauda bottcher |
| **CQ5**: What is the suitable chemical control of (*Inflorescence rot disease*) | SELECT DISTINCT ?Disease ?Chemical\_Control  WHERE { ?Disease dp:is\_Disease\_Of dp:Date\_Palm.  ?Disease dp:has\_Chemical\_Control ?Chemical\_Control.  FILTER(?Disease = dp:Inflorescence\_Rot\_Disease)} | **Chemical Control =**   1. Thiophanate\_Methyl 2. Maneb 3. Benomyl 4. Metalaxyl-M 5. Mancopper 6. Bordeaux\_Mixture 7. Mancozeb 8. Copper\_Oxychloride 9. Dichlone 10. Bavistin 11. Thiram |
| **CQ6**: What is the suitable cultural control of *(Fusarium wilt disease)* | SELECT DISTINCT ?Disease ?Cultural\_Control  WHERE { ?Disease dp:is\_Disease\_Of dp:Date\_Palm.  ?Disease dp:has\_Cultural\_Control ?Cultural\_Control.  FILTER(?Disease = dp:Fusarium\_Wilt\_Disease)} | **Cultural\_Control =**   1. Use of thermal sterilization. 2. Avoid excessive irrigation. 3. stop planting in the same site. 4. uprooted and burned infected palms on the spot. 5. Agricultural quarantine. 6. Stop planting of Hijazi Alfalfa. |
| **CQ7**: What is the suitable biological control of (*Fruit Stalk Borer Damage)* | SELECT DISTINCT ?Damage ?Biological\_Control  WHERE { ?Damage dp:is\_Pest\_Damage\_Of dp:Date\_Palm.  ?Damage dp:has\_Biological\_Control ?Biological\_Control .  FILTER(?Damage = dp:Fruit\_Stalk\_Borer\_Damage)} | **Biological Control =**   1. Metarhizium anisopliae 2. Beauveria bassiana 3. Rhabdits blumi |
| **CQ8**: What is the suitable chemical control of  (*Bayoud disease*) | SELECT DISTINCT ?Disease ?Chemical\_Control  WHERE { ?Disease dp:is\_Disease\_Of dp:Date\_Palm.  ?Disease dp:has\_Chemical\_Control ?Chemical\_Control.  FILTER(?Disease =dp:Bayoud\_Disease)} | **Chemical Control =**   1. Thiophanate\_Methyl 2. Chloropicrin 3. Methyl\_Bromide 4. Hymexazol |
| **CQ9**: What is the suitable cultural control of  (*Black scorch disease of date palm*) | SELECT DISTINCT ?Disease ?Cultural\_Control  WHERE { ?Disease dp:is\_Disease\_Of dp:Date\_Palm.  ?Disease dp:has\_Cultural\_Control ?Cultural\_Control.  FILTER(?Disease = dp:Black\_Scorch\_Disease)} | **Cultural\_Control =**   1. Avoid planting of Infected offshoot. 2. Protect wounds on palm parts. 3. Avoid removing spines by pulling. 4. Avoid injuries of palms parts. 5. Remove and burn of infected plant part. 6. Uprooted and burned of infected palms on the spot. 7. Ensure proper operation and maintenance. |
| **CQ10**: What is the suitable chemical control of  (*Diplodia Leaf-Base disease*) | SELECT DISTINCT ?Disease ?Chemical\_Control  WHERE { ?Disease dp:is\_Disease\_Of dp:Date\_Palm.  ?Disease dp:has\_Chemical\_Control ?Chemical\_Control.  FILTER(?Disease =dp:Diplodia\_Leaf-Base\_Disease)} | **Chemical Control =**   1. Thiophanate\_Methyl 2. Bordeaux\_Mixture 3. Thiram |
| **CQ11**: What is the application rate of “Bavistin” to control (*Inflorescence rot disease)*? | SELECT DISTINCT ?Disease ?Chemical\_Control ?Application\_Rate  WHERE { ?Disease dp:is\_Disease\_Of dp:Date\_Palm.  ?Disease dp:has\_Chemical\_Control ?Chemical\_Control.  ?Chemical\_Control dp:has\_Application\_Rate ?Application\_Rate.  FILTER(?Chemical\_Control =dp:Bavistin && (?Disease =dp:Inflorescence\_Rot\_Disease))} | **Application Rate =** 100-150 g/100 L water, about (10 L) of pesticide. |
| **CQ12**: What is the application rate of “Mancozeb” to control (*Back Scorch disease*)? | SELECT DISTINCT ?Disease ?Chemical\_Control ?Application\_Rate  WHERE { ?Disease dp:is\_Disease\_Of dp:Date\_Palm.  ?Disease dp:has\_Chemical\_Control ?Chemical\_Control.  ?Chemical\_Control dp:has\_Application\_Rate ?Application\_Rate.  FILTER(?Chemical\_Control =dp:Mancozeb && (?Disease =dp:Black\_Scorch\_Disease))} | **Application Rate =** 250-300 g/100 L water, about (10 L) of pesticide. |
| **CQ13**: What is the application rate and method of “Cypermethrin” to control (*Rhynchophorus Ferrugineus*)? | SELECT DISTINCT ?Pest ?Chemical\_Control ?Application\_Rate ?Application\_Method  WHERE { ?Pest dp:is\_Pest\_Of dp:Date\_Palm.  ?Pest dp:has\_Chemical\_Control ?Chemical\_Control.  ?Chemical\_Control dp:has\_Application\_Rate ?Application\_Rate;  dp:has\_Application\_Method ?Application\_Method.  FILTER(?Chemical\_Control =dp:Cypermethrin && (?Pest=dp:Rhynchophorus\_Ferrugineus))} | **Application Rate =** 100 ml /100 liters of water.  **Application Method =** Spraying. |
| **CQ14**: How to apply "Sodium hypochlorite" to control (*Fusarium wilt disease*)? | SELECT DISTINCT ?DiseaseName ?Bactericide\_Chemical\_Control ?Usage\_Descrption  WHERE { ?DiseaseName rdfs:label "fusarium wilt disease"@en.  ?p rdf:type owl:Axiom ;  owl:annotatedSource dp:Fusarium\_Wilt\_Disease;  owl:annotatedProperty dp:has\_Bactericide\_Chemical\_Control;  owl:annotatedTarget ?Bactericide\_Chemical\_Control;  dp:has\_Bactericide\_Usage\_Descrption ?Usage\_Descrption.  FILTER( ?Bactericide\_Chemical\_Control = dp:Sodium\_Hypochlorite)} | **Usage Description =**  “Used when pruning trees by dipping the pruning shears in the Sodium hypochlorite solution”. |
| **CQ15**: For which disease or pest "Methyl Bromide" used? | SELECT DISTINCT ?Control\_Method ?DiseaseName  WHERE { ?DiseaseName dp:is\_Disease\_Of dp:Date\_Palm.  ?DiseaseName dp:has\_Recommended\_Control ?Control\_Method.  FILTER(?Control\_Method = dp:Methyl\_Bromide)} | **Disease/Pest =**   1. Bayoud disease 2. Fusarium wilt disease |
| **CQ16**: What is "Metalaxyl-M" and for which disease or pest used? | SELECT DISTINCT ?Control\_Method ?DiseaseName ?Control\_Method\_Definethion  WHERE { ?DiseaseName dp:is\_Disease\_Of dp:Date\_Palm.  ?DiseaseName dp:has\_Recommended\_Control ?Control\_Method.  ?Control\_Method dp:definetion ?Control\_Method\_Definethion.  FILTER(?Control\_Method = dp:Metalaxyl-M)} | **Control Method Definition =**  “Metalaxyl is an acylalanine fungicide with systemic function.”  **Disease/Pest =**   1. Back Scorch disease 2. Inflorescence rot disease |
| **CQ17**: What is the suitable chemical control of  (*Graphiola leaf spot disease*)? | SELECT DISTINCT ?Disease ?Chemical\_Control  WHERE { ?Disease dp:is\_Disease\_Of dp:Date\_Palm.  ?Disease dp:has\_Chemical\_Control ?Chemical\_Control.  FILTER(?Disease =dp:Graphiola\_Leaf\_Spot\_Disease)} | **Chemical Control =**   1. Copper\_Hydroxide 2. Maneb 3. Bordeaux\_Mixture 4. Mancozeb |
| **CQ18**: What is the suitable cultural control of  (*Graphiola leaf spot disease*)? | SELECT DISTINCT ?Disease ?Cultural\_Control  WHERE { ?Disease dp:is\_Disease\_Of dp:Date\_Palm.  ?Disease dp:has\_Cultural\_Control ?Cultural\_Control.  FILTER(?Disease = dp:Graphiola\_Leaf\_Spot\_Disease)} | **Cultural\_Control =**   1. Follow the appropriate distance between palm trees. 2. Remove and burn of infected leaves. |
| **CQ19**: What is the suitable biological control of a (*Longhorn date palm stem borer damage*)? | SELECT DISTINCT ?Damage ?Biological\_Control  WHERE { ?Damage dp:is\_Pest\_Damage\_Of dp:Date\_Palm.  ?Damage dp:has\_Biological\_Control ?Biological\_Control .  FILTER(?Damage = dp:Longhorn\_Date\_Palm\_Stem\_Borer\_Damage)} | **Biological Control =**  Metarhizium\_Anisopliae  Beauveria\_Bassiana  Rhabdits\_Blumi |
| **CQ20**: What is the application rate and method of “Methidathion” to control (*Rhynchophorus Ferrugineus*)? | SELECT DISTINCT ?Pest ?Chemical\_Control ?Application\_Rate ?Application\_Method  WHERE { ?Pest dp:is\_Pest\_Of dp:Date\_Palm.  ?Pest dp:has\_Chemical\_Control ?Chemical\_Control.  ?Chemical\_Control dp:has\_Application\_Rate ?Application\_Rate;  dp:has\_Application\_Method ?Application\_Method.  FILTER(?Chemical\_Control =dp:Methidathion && (?Pest=dp:Rhynchophorus\_Ferrugineus))} | **Application Rate =** 150 ml /100 liters of water.  **Application Method =** Spraying. |
| **Symptom** | **CQ1**: What are the possible symptoms associated with (*Fusarium wilt disease*)? | SELECT DISTINCT ?Problem ?Symptom  WHERE { ?Problem dp:influence dp:Date\_Palm;  dp:has\_Symptom ?Symptom.  FILTER(?Problem = dp:Fusarium\_Wilt\_Disease)} | **Symptom =**   1. Dark brown stripe on leaf rachis. 2. Wilting on one side of leaf. 3. Leaf become yellow white on one side. 4. Rapid wilting of offshoots. 5. Root rot. 6. Leaves hangs down along the trunk. 7. Leaves becomes arched. |
| **CQ2**: What are the possible symptoms associated with (*Red palm weevil damage*)? | SELECT DISTINCT ?Problem ?Symptom  WHERE { ?Problem dp:influence dp:Date\_Palm;  dp:has\_Symptom ?Symptom.  FILTER(?Problem = dp:Red\_Palm\_Weevil\_Damage)} | **Symptom =**   1. Leaf becomes yellow. 2. Oozing of brownish fluid with typical fermented odor. 3. Tunneling of palm tissue . 4. Wilting of offshoots. 5. Holes that look chewed and broken on leaf 6. Small round holes at the site of removed offshoots. 7. Ejection of chewed-up fibers from wounds. 8. Toppling of the Trunk 9. Drying of leaf and fruit bunch 10. Offshoot becomes yellow. 11. Drying of offshoots. 12. Death of offshoot. 13. Wilting of leaf. |
| **CQ3**: What are the possible symptoms associated with (*Inflorescence rot disease*)? | SELECT DISTINCT ?Problem ?Symptom  WHERE { ?Problem dp:influence dp:Date\_Palm;  dp:has\_Symptom ?Symptom.  FILTER(?Problem = dp:Inflorescence\_Rot\_Disease)} | **Symptom =**   1. Rot of young green fruit. 2. Brown or rusty spots. 3. Partial or complete destruction of flowers and spikelets. 4. Inflorescences covered with pink or white or black powder. 5. Drying of inflorescence. 6. Rot of flowers and spikelets. |
| **CQ4**: What are the possible symptoms associated with (*Back Scorch disease*)? | SELECT DISTINCT ?Problem ?Symptom  WHERE { ?Problem dp:influence dp:Date\_Palm;  dp:has\_Symptom ?Symptom.  FILTER(?Problem = dp:Black\_Scorch\_Disease)} | **Symptom =**   1. Death of leaflet from the tip backwards. 2. Trunk rot. 3. Malformation and twisting of leave. 4. inflorescence blight. 5. black rot on inflorescence. 6. Leaf with scorched or charcoal like appearance. 7. Root rot. 8. Dark brown or black hard lesions on leaves. 9. Terminal bud rot and blackening. 10. Round to oblong dark brown spots. 11. Diminishes growth of new leaves. |
| **CQ5**: What are the possible symptoms associated with (*Graphiola leaf spot disease*)? | SELECT DISTINCT ?Problem ?Symptom  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:has\_Symptom ?Symptom.  FILTER(?Problem = dp:Graphiola\_Leaf\_Spot\_Disease)} | **Symptom =**   1. Yellow pustules that turn black on lower old leaves. 2. Drying of leaves. 3. Subepidermal spots on both sides of leaflet and rachis. |
| **CQ6**: What are the most common general symptoms of plant disease or pest damage? | SELECT DISTINCT ?Common\_Symptom  WHERE { ?Common\_Symptom rdfs:subClassOf dp:Symptom.} | **Most Common** **Symptom =**   1. Die\_Back 2. Blight 3. Dryness 4. Spotting 5. Dwarfing 6. Shot\_Hole 7. Downy\_Mildew 8. Canker 9. Spores 10. Rust 11. Mildew 12. Death 13. Exudation 14. Powdery\_Mildew 15. Wilting 16. Ejection 17. Necrosis\_Lesion 18. Scorch 19. Puncture 20. Damping\_Off 21. Malformation 22. Discoloration 23. Rotting 24. Pustule 25. Streaking 26. Boring 27. Gummosis 28. Transformation 29. Breaking |
| **CQ7:** What is the “Die\_Back” symptom means? | SELECT DISTINCT ?Symptom ?Symptom\_Definition  WHERE {  ?Symptom dp:definetion ?Symptom\_Definition .  FILTER(?Symptom = dp:Die\_Back)} | **Symptom Definition =** “Progressive death of shoots, branches and roots generally starting at the tip.” |
| **CQ8**:What is the “Blight” symptom means? | SELECT DISTINCT ?Symptom ?Symptom\_Definition  WHERE {  ?Symptom dp:definetion ?Symptom\_Definition .  FILTER(?Symptom = dp:Blight)} | **Symptom Definition =** “Sudden, severe, and extensive spotting, discoloration, wilting, or destruction of leaves, flowers, stems, or entire plants.” |
| **CQ9**: What is the “Discolouration” symptom means? | SELECT DISTINCT ?Symptom ?Symptom\_Definition  WHERE {  ?Symptom dp:definetion ?Symptom\_Definition .  FILTER(?Symptom = dp:Discolouration)} | **Symptom Definition =** “The change in the normal colour of the plant/plant part to a different colour.” |
| **CQ10**: What is the “Scorch” symptom means? | SELECT DISTINCT ?Symptom ?Symptom\_Definition  WHERE {  ?Symptom dp:definetion ?Symptom\_Definition .  FILTER(?Symptom = dp:Scorch)} | **Symptom Definition =** “Any symptom that suggests the action of flame or fire on the affected part, often seen at the margins of leaves; “Burning” of leaf margins as a result of infection or unfavourable environmental conditions.” |
| **CQ11:** What are the distinct characteristics of "Wilting" symptom? | SELECT ?Class ?has\_Characteristic  WHERE { ?Class rdfs:subClassOf [ rdf:type owl:Restriction ;  owl:hasValue ?has\_Characteristic;  owl:onProperty dp:has\_Characteristic]  FILTER(?Class = dp:Wilting)} | **Symptom Characteristic =**   1. Drying of young growing tip or the whole plant. 2. Leaves become flaccid. 3. Leaves become yellow. 4. Leaves droop down. 5. Leaves lose their turgidity. 6. Sick or weak appearance. |
| **CQ12**: What are the distinct characteristics of " Scorch" symptom? | SELECT ?Class ?has\_Characteristic  WHERE { ?Class rdfs:subClassOf [ rdf:type owl:Restriction ;  owl:hasValue ?has\_Characteristic;  owl:onProperty dp:has\_Characteristic]  FILTER(?Class = dp:Scorch)} | **Symptom Characteristic =**   1. Browning of leaf edges or veins. 2. Diminishes growth of new leaves. 3. Charcoal-like appearance of affected plant part. 4. Death of leaflet from the tip backwards. |
| **CQ13**: What are the distinct characteristics of " Shot\_Hole" symptom? | SELECT ?Class ?has\_Characteristic  WHERE { ?Class rdfs:subClassOf [ rdf:type owl:Restriction ;  owl:hasValue ?has\_Characteristic;  owl:onProperty dp:has\_Characteristic]  FILTER(?Class = dp:Shot\_Hole)} | **Symptom Characteristic =**   1. Circular or irregular scorched holes. 2. Formation of localised lesions on leaves. |
| **CQ14**: What are the distinct characteristics of "Gummosis” symptom? | SELECT ?Class ?has\_Characteristic  WHERE { ?Class rdfs:subClassOf [ rdf:type owl:Restriction ;  owl:hasValue ?has\_Characteristic;  owl:onProperty dp:has\_Characteristic]  FILTER(?Class = dp:Gummosis)} | **Symptom Characteristic =** Production of gum. |
| **CQ15**: What are the distinct characteristics of " Blight” symptom? | SELECT ?Class ?has\_Characteristic  WHERE { ?Class rdfs:subClassOf [ rdf:type owl:Restriction ;  owl:hasValue ?has\_Characteristic;  owl:onProperty dp:has\_Characteristic]  FILTER(?Class = dp: Blight)} | **Symptom Characteristic =** Burnt-like appearance to affected plant part. |
| **Causal Agent** | **CQ1**: What is the scientific name of major agents of (*Inflorescence rot disease*)? | SELECT DISTINCT ?Problem ?Causal\_Agent\_Scientific\_name  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:is\_Caused\_By ?Causal\_Agent .  ?Causal\_Agent dp:has\_Scientific\_name ?Causal\_Agent\_Scientific\_name .  FILTER(?Problem = dp:Inflorescence\_Rot\_Disease)} | **Major Agents Scientific Name =**   1. Alternaria alternata. 2. Thieaviopsis\_Paradoxa\_(De\_Seyn.) \_Hohn. 3. Alternaria chlamydospore. 4. Fusarium moniliforme J. Sheld. 5. Mauginiella\_Scattae\_Cav. |
| **CQ2**: What is the scientific name of major agents of (*Black scorch disease*)? | SELECT DISTINCT ?Problem ?Causal\_Agent\_Scientific\_name  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:is\_Caused\_By ?Causal\_Agent .  ?Causal\_Agent dp:has\_Scientific\_name ?Causal\_Agent\_Scientific\_name .  FILTER(?Problem = dp:Black\_Scorch\_Disease)} | **Major Agents Scientific Name =**   1. Ceratocystis\_Paradoxa\_(Dade)\_C.Moreau. 2. Chalara\_Paradoxa\_(De\_Seyn.)\_Sacc. |
| **CQ3**: What is the scientific name of major agents of (*Ganoderma butt rot disease*)? | SELECT DISTINCT ?Problem ?Causal\_Agent\_Scientific\_name  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:is\_Caused\_By ?Causal\_Agent .  ?Causal\_Agent dp:has\_Scientific\_name ?Causal\_Agent\_Scientific\_name .  FILTER(?Problem = dp:Ganoderma\_Butt\_Rot\_Disease)} | **Major Agents Scientific Name =**   1. Ganoderma zonatum. 2. Ganoderma Tornatum (Pers.) Brisad. 3. Ganoderma boninense. |
| **CQ4**: What is the scientific name of major agents of (*Anthracnose disease of date palm*)? | SELECT DISTINCT ?Problem ?Causal\_Agent\_Scientific\_name  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:is\_Caused\_By ?Causal\_Agent .  ?Causal\_Agent dp:has\_Scientific\_name ?Causal\_Agent\_Scientific\_name .  FILTER(?Problem = dp:Anthracnose\_Disease\_Of\_Date\_Palm)} | **Major Agents Scientific Name =**   1. Colletotrichum\_Gloeosporioides\_(Penz.)Sacc. |
| **CQ5**: What is the scientific name of major agents of (*Diplodia leaf-base disease*)? | SELECT DISTINCT ?Problem ?Causal\_Agent\_Scientific\_name  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:is\_Caused\_By ?Causal\_Agent .  ?Causal\_Agent dp:has\_Scientific\_name ?Causal\_Agent\_Scientific\_name .  FILTER(?Problem = dp:Diplodia\_Leaf-Base\_Disease )} | **Major Agents Scientific Name =**   1. Diplodia phoenicum (Sacc.) Fawc. & Klotz. |
| **CQ6**: What is the scientific name of major agents of (*Fusarium wilt disease*)? | SELECT DISTINCT ?Problem ?Causal\_Agent\_Scientific\_name  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:is\_Caused\_By ?Causal\_Agent .  ?Causal\_Agent dp:has\_Scientific\_name ?Causal\_Agent\_Scientific\_name .  FILTER(?Problem = dp:Fusarium\_Wilt\_Disease )} | **Major Agents Scientific Name =**   1. Fusarium Oxysporum Schlecht. |
| **CQ7**: What is the scientific name of major agents of (*Reddish brown parallel spot disease*)? | SELECT DISTINCT ?Problem ?Causal\_Agent\_Scientific\_name  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:is\_Caused\_By ?Causal\_Agent .  ?Causal\_Agent dp:has\_Scientific\_name ?Causal\_Agent\_Scientific\_name .  FILTER(?Problem = dp:Reddish\_Brown\_Parallel\_Spot\_Disease)} | **Major Agents Scientific Name =**   1. Curvularia australiensis. 2. Curvularia spicifera. |
| **CQ8**: What is the scientific name of major agents of (*Date palm Dubas bug damage*)? | SELECT DISTINCT ?Problem ?Causal\_Agent\_Scientific\_name  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:is\_Caused\_By ?Causal\_Agent .  ?Causal\_Agent dp:has\_Scientific\_name ?Causal\_Agent\_Scientific\_name .  FILTER(?Problem = dp:Date\_Palm\_Dubas\_Bug\_Damage)} | **Major Agents Scientific Name =**   1. Ommatissus lybicus de Bergevin. |
| **CQ9**: What is the scientific name of major agents of (*Lesser date moth damage*)? | SELECT DISTINCT ?Problem ?Causal\_Agent\_Scientific\_name  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:is\_Caused\_By ?Causal\_Agent .  ?Causal\_Agent dp:has\_Scientific\_name ?Causal\_Agent\_Scientific\_name .  FILTER(?Problem = dp:Lesser\_Date\_Moth\_Damage)} | **Major Agents Scientific Name =**   1. Batrachedra amydraula Meyer. |
| **CQ10**: What is the scientific name of major agents of (*Palm frond borer damage*)? | SELECT DISTINCT ?Problem ?Causal\_Agent\_Scientific\_name  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:is\_Caused\_By ?Causal\_Agent .  ?Causal\_Agent dp:has\_Scientific\_name ?Causal\_Agent\_Scientific\_name .  FILTER(?Problem = dp:Palm\_Frond\_Borer\_Damage)} | **Major Agents Scientific Name =**   1. Phonopate frontalis (Fahs.) |
| **CQ11**: What is the scientific name of major agents of (*Longhorn date palm stem borer damage*)? | SELECT DISTINCT ?Problem ?Causal\_Agent\_Scientific\_name  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:is\_Caused\_By ?Causal\_Agent .  ?Causal\_Agent dp:has\_Scientific\_name ?Causal\_Agent\_Scientific\_name .  FILTER(?Problem = dp:Longhorn\_Date\_Palm\_Stem\_Borer\_Damage)} | **Major Agents Scientific Name =**  Jebusaea hammerschmidti. |
| **CQ12**: What is the scientific name of major agents of (*Mealy bugs damage*)? | SELECT DISTINCT ?Problem ?Causal\_Agent\_Scientific\_name  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:is\_Caused\_By ?Causal\_Agent .  ?Causal\_Agent dp:has\_Scientific\_name ?Causal\_Agent\_Scientific\_name .  FILTER(?Problem = dp:Mealy\_Bugs\_Damage)} | **Major Agents Scientific Name =**  Maconellicoccus hirsutus (Green). |
| **CQ13:** What are the most common type of biotic factors that contribute to the emergence of a plant disease/damage? | SELECT DISTINCT ?Biotic\_Causal\_Agent  WHERE {?Biotic\_Causal\_Agent rdfs:subClassOf dp:Biotic\_Causal\_Agent.} | **Biotic Factors =**   1. Fungi 2. Virus 3. Nematode 4. Protozoa 5. Viroid 6. Parasitic\_Plant 7. Bacteria 8. Phytoplasma 9. Pest\_Insect 10. Pest\_Mite |
| **CQ14**: What are the environmental factors that contribute to the emergence of *(Inflorescence rot disease*)? | SELECT DISTINCT ?Problem ?Environmental\_Factor  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:has\_Preferable\_Environmental\_Factor ?Environmental\_Factor .  FILTER(?Problem = dp:Inflorescence\_Rot\_Disease)} | **Environmental Factors =**   1. High humidity 2. 15-21°C in spring 3. Low temperature 4. Cold and wet winter 5. Heavy rain in winter and spring |
| **CQ15**: What are the environmental factors that contribute to the emergence of (*Black scorch disease*)? | SELECT DISTINCT ?Problem ?Environmental\_Factor  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:has\_Preferable\_Environmental\_Factor ?Environmental\_Factor .  FILTER(?Problem = dp:Black\_Scorch\_Disease)} | **Environmental Factors =**   1. High humidity 2. High soil moisture 3. Silty soil 4. Moderate temperature (25°C) 5. Rain |
| **CQ16**: What are the environmental factors that contribute to the emergence of the insect (*Rhynchophorus Ferrugineus*)? | SELECT DISTINCT ?Problem ?Environmental\_Factor  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:has\_Preferable\_Environmental\_Factor ?Environmental\_Factor .  FILTER(?Problem = dp:Red\_Palm\_Weevil\_Damage)} | **Environmental Factors =**   1. High humidity 2. High soil moisture |
| **CQ17**: What are the agricultural practices that contribute to the emergence of (*Fusarium wilt disease*)? | SELECT DISTINCT ?Problem ?Agricultural\_Practices  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:has\_Agricultural\_Practice ?Agricultural\_Practices .  FILTER(?Problem = dp:Fusarium\_Wilt\_Disease)} | **Agricultural Practices =**   1. Bad drainage. 2. Increase irrigation water. 3. Increased nitrogen fertilization. |
| **CQ18**: What are the agricultural practices that contribute to the emergence of the insect (*Red palm weevil damage*)? | SELECT DISTINCT ?Problem ?Agricultural\_Practices  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:has\_Agricultural\_Practice ?Agricultural\_Practices .  FILTER(?Problem = dp:Red\_Palm\_Weevil\_Damage)} | **Agricultural Practices =**  Closely spaced planting.  Beheaded palms.  Open flood irrigation.  Neglected plantation.  Closed gardens. |
| **CQ19**: What is the transmission mode of "*Fusarium Oxysporum Schlecht*" fungi that cause fusarium wilt disease? | SELECT DISTINCT ?Causal\_Agent ?Causal\_Agent\_Trait  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:is\_Caused\_By ?Causal\_Agent .  ?Causal\_Agent dp:has\_Trait ?Causal\_Agent\_Trait  FILTER(?Causal\_Agent = dp:Fusarium\_Oxysporum\_Schlecht)} | **Transmission Mode =**   1. Transmitted through infected offshoots. 2. Transmitted through nematode infection. 3. Transmitted through winds. 4. Transmitted through insect infection. |
| **CQ20**: What is the transmission mode of the insect "*Rhynchophorus\_Ferrugineus*" ? | SELECT DISTINCT ?Causal\_Agent ?Causal\_Agent\_Trait  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:is\_Caused\_By ?Causal\_Agent .  ?Causal\_Agent dp:has\_Trait ?Causal\_Agent\_Trait  FILTER(?Causal\_Agent = dp:Rhynchophorus\_Ferrugineus)} | **Transmission Mode =**   1. Transmitted through infected offshoots. 2. Transmitted through Infested planting material. |
| **Others** | **CQ1**: What is the active time of the insect "*Rhynchophorus\_Ferrugineus*" ? | SELECT DISTINCT ?Pest ?Outbreak\_Time  WHERE {?Pest dp:is\_Pest\_Of dp:Date\_Palm;  dp:has\_Time ?Outbreak\_Time.  FILTER(?Pest = dp:Rhynchophorus\_Ferrugineus)} | **Outbreak Time =**   1. February 2. October 3. September 4. March |
| **CQ2**: What is the expected outbreak time of *(Inflorescence rot disease*)? | SELECT DISTINCT ?Problem ?Outbreak\_Time  WHERE {?Problem dp:influence dp:Date\_Palm;  dp:has\_Time ?Outbreak\_Time.  FILTER(?Problem = dp:Inflorescence\_Rot\_Disease )} | **Outbreak Time =**   1. February 2. March |
| **CQ3**: What varieties or cultivars are most susceptible to (*Black scorch disease*)? | SELECT DISTINCT ?Problem ?Susceptible\_Cultivars  WHERE { ?Problem dp:influence dp:Date\_Palm;  dp:is\_Harmful\_For ?Susceptible\_Cultivars .  FILTER(?Problem = dp:Black\_Scorch\_Disease)} | **Susceptible Cultivars =**   1. Halooa 2. Zahdi 3. Barhi 4. Hallawi 5. Deglet\_Nour 6. Medjool |
| **CQ4**: What varieties or cultivars are most susceptible to (*Fusarium wilt disease*)? | SELECT DISTINCT ?Problem ?Susceptible\_Cultivars  WHERE { ?Problem dp:influence dp:Date\_Palm;  dp:is\_Harmful\_For ?Susceptible\_Cultivars .  FILTER(?Problem = dp:Fusarium\_Wilt\_Disease)} | **Susceptible Cultivars =**   1. Dakhini 2. Nbut\_Saif 3. Khediri |
| **CQ5**: What varieties or cultivars are most susceptible to *(Inflorescence rot disease*)? | SELECT DISTINCT ?Problem ?Susceptible\_Cultivars  WHERE { ?Problem dp:influence dp:Date\_Palm;  dp:is\_Harmful\_For ?Susceptible\_Cultivars .  FILTER(?Problem = dp:Inflorescence\_Rot\_Disease)} | **Susceptible Cultivars =**   1. Sayer 2. Sukari 3. Barhi 4. Medjool 5. Ghars |
| **CQ6**: What varieties or cultivars are most susceptible to *(Graphiola leaf spot disease*)? | SELECT DISTINCT ?Problem ?Susceptible\_Cultivars  WHERE { ?Problem dp:influence dp:Date\_Palm;  dp:is\_Harmful\_For ?Susceptible\_Cultivars .  FILTER(?Problem = dp:Graphiola\_Leaf\_Spot\_Disease)} | **Susceptible Cultivars =**   1. Zahdi 2. Maktoom 3. Ashrasi 4. Khisab 5. Bream |
| **CQ7**: What are the possible affected plant parts by (Graphiola leaf spot disease)? | SELECT DISTINCT ?Problem ?PlantPart  WHERE { ?Problem dp:influence dp:Date\_Palm;  dp:has\_Symptom ?Symptom.  ?Symptom dp:is\_Appear\_On ?PlantPart.  FILTER(?Problem = dp:Graphiola\_Leaf\_Spot\_Disease)} | **Affected Plant Part =**   1. Leaf rachis 2. Old leaves 3. Leaflet |
| **CQ8**: What are the possible affected plant parts by *(Inflorescence rot disease*)? | WHERE { ?Problem dp:influence dp:Date\_Palm;  dp:has\_Symptom ?Symptom.  ?Symptom dp:is\_Appear\_On ?PlantPart.  FILTER(?Problem = dp:Inflorescence\_Rot\_Disease)} | **Affected Plant Part =**   1. Date 2. External surface of unopened spathe 3. Spikelets or Strands 4. Flowers 5. Palm inflorescence |
| **CQ9**: What are the possible affected plant parts by *(Red palm weevil damage*)? | SELECT DISTINCT ?Problem ?PlantPart  WHERE { ?Problem dp:influence dp:Date\_Palm;  dp:has\_Symptom ?Symptom.  ?Symptom dp:is\_Appear\_On ?PlantPart.  FILTER(?Problem = dp:Red\_Palm\_Weevil\_Damage)} | **Affected Plant Part =**   1. Leaves 2. Palm trunk 3. Leaf bases 4. Fruit bunch 5. Outer leaves 6. Offshoots |
| **CQ10**: What are the possible affected plant parts by (*Longhorn date palm stem borer damage*)? | SELECT DISTINCT ?Problem ?PlantPart  WHERE { ?Problem dp:influence dp:Date\_Palm;  dp:has\_Symptom ?Symptom.  ?Symptom dp:is\_Appear\_On ?PlantPart.  FILTER(?Problem = dp:Longhorn\_Date\_Palm\_Stem\_Borer\_Damage)} | **Affected Plant Part =**   1. Leaf bases 2. Palm trunk |

1. **Results of evaluation by domain experts**

Table 3: The results of the domain experts' evaluation (Disease/Pest category).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Question*** | ***Mean*** | ***SD*** | ***relative weight (%)*** | ***Degree#*** | ***Rank*** |
| CQ1 | 6.15 | 0.90 | 87.91 | Strongly agree | 2 |
| CQ2 | 6.08 | 1.04 | 86.81 | Strongly agree | 5 |
| CQ3 | 4.50 | 2.59 | 64.29 | Somewhat agree | 25 |
| CQ4 | 5.88 | 0.99 | 83.93 | Agree | 9 |
| CQ5 | 5.90 | 0.88 | 84.29 | Agree | 8 |
| CQ6 | 6.10 | 0.74 | 87.14 | Strongly agree | 4 |
| CQ7 | 5.50 | 0.84 | 78.57 | Agree | 15 |
| CQ8 | 5.17 | 1.47 | 73.81 | Agree | 20 |
| CQ9 | 5.17 | 0.98 | 73.81 | Agree | 20 |
| CQ10 | 5.50 | 0.80 | 78.57 | Agree | 15 |
| CQ11 | 4.83 | 2.04 | 69.05 | Somewhat agree | 23 |
| CQ12 | 5.83 | 0.75 | 83.33 | Agree | 11 |
| CQ13 | 5.33 | 0.52 | 76.19 | Agree | 18 |
| CQ14 | 5.10 | 1.29 | 72.86 | Agree | 22 |
| CQ15 | 5.73 | 1.27 | 81.82 | Agree | 13 |
| CQ16 | 5.91 | 1.38 | 84.42 | Agree | 6 |
| CQ17 | 6.29 | 0.49 | 89.80 | Strongly agree | 1 |
| CQ18 | 5.86 | 0.90 | 83.67 | Agree | 10 |
| CQ19 | 5.80 | 0.92 | 82.86 | Agree | 12 |
| CQ20 | 5.70 | 1.49 | 81.43 | Agree | 14 |
| CQ21 | 5.44 | 1.01 | 77.78 | Agree | 17 |
| CQ22 | 5.91 | 1.14 | 84.42 | Agree | 6 |
| CQ23 | 6.11 | 1.05 | 87.30 | Strongly agree | 3 |
| CQ24 | 5.25 | 1.16 | 75.00 | Agree | 19 |
| CQ25 | 4.83 | 1.59 | 69.05 | Somewhat agree | 23 |
| ***Disease/ Pest*** | ***5.68*** | ***0.79*** | ***81.09*** | ***Agree*** |  |

***# Strongly agree is from 100% to greater than 85.7%, agree is 85.6% to greater than 71.4%, and somewhat agree is less than 71.3% to greater than 57.1%.***

Table 4: The results of the domain experts' evaluation (Control Methods category).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Question*** | ***Mean*** | ***SD*** | ***relative weight (%)*** | ***Degree#*** | ***Rank*** |
| CQ1 | 5.00 | 2.24 | 71.43 | Somewhat agree | 15 |
| CQ2 | 5.00 | 1.29 | 71.43 | Somewhat agree | 15 |
| CQ3 | 6.00 | 1.00 | 85.71 | Strongly agree | 2 |
| CQ4 | 5.64 | 1.29 | 80.52 | Agree | 10 |
| CQ5 | 5.71 | 1.11 | 81.63 | Agree | 5 |
| CQ6 | 5.71 | 1.38 | 81.63 | Agree | 5 |
| CQ7 | 6.09 | 1.04 | 87.01 | Strongly agree | 1 |
| CQ8 | 5.57 | 1.72 | 79.59 | Agree | 11 |
| CQ9 | 5.71 | 1.38 | 81.63 | Agree | 5 |
| CQ10 | 5.71 | 1.25 | 81.63 | Agree | 5 |
| CQ11 | 4.86 | 1.86 | 69.39 | Somewhat agree | 18 |
| CQ12 | 5.29 | 1.70 | 75.51 | Agree | 13 |
| CQ13 | 4.64 | 2.25 | 66.23 | Somewhat agree | 20 |
| CQ14 | 5.29 | 1.60 | 75.51 | Agree | 13 |
| CQ15 | 4.75 | 2.43 | 67.86 | Somewhat agree | 19 |
| CQ16 | 5.86 | 0.69 | 83.67 | Agree | 4 |
| CQ17 | 5.71 | 0.76 | 81.63 | Agree | 5 |
| CQ18 | 6.00 | 0.58 | 85.71 | Strongly agree | 2 |
| CQ19 | 5.33 | 1.67 | 76.19 | Agree | 12 |
| CQ20 | 4.91 | 1.76 | 70.13 | Somewhat agree | 17 |
| ***Control Methods*** | ***4.88*** | ***2.01*** | ***69.71*** | ***Somewhat agree*** |  |

***# Strongly agree is from 100% to greater than 85.7%, agree is 85.6% to greater than 71.4%, and somewhat agree is less than 71.3% to greater than 57.1%.***

*Table 5:The results of the domain experts' evaluation (Symptom of Disease/Pest category).*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Question*** | ***Mean*** | ***SD*** | ***relative weight (%)*** | ***Degree#*** | ***Rank*** |
| CQ1 | 6.13 | 0.64 | 87.50 | Strongly agree | 3 |
| CQ2 | 6.17 | 0.72 | 88.10 | Strongly agree | 2 |
| CQ3 | 5.63 | 1.19 | 80.36 | Agree | 12 |
| CQ4 | 5.33 | 1.21 | 76.19 | Agree | 15 |
| CQ5 | 6.00 | 0.58 | 85.71 | Strongly agree | 5 |
| CQ6 | 5.40 | 1.26 | 77.14 | Agree | 14 |
| CQ7 | 5.82 | 1.08 | 83.12 | Agree | 11 |
| CQ8 | 6.00 | 0.53 | 85.71 | Strongly agree | 5 |
| CQ9 | 6.18 | 0.60 | 88.31 | Strongly agree | 1 |
| CQ10 | 5.89 | 0.60 | 84.13 | Agree | 10 |
| CQ11 | 6.00 | 0.58 | 85.71 | Strongly agree | 5 |
| CQ12 | 5.60 | 0.55 | 80.00 | Agree | 13 |
| CQ13 | 5.90 | 0.74 | 84.29 | Agree | 9 |
| CQ14 | 6.11 | 0.60 | 87.30 | Strongly agree | 4 |
| CQ15 | 6.00 | 0.76 | 85.71 | Strongly agree | 5 |
| ***Symptom of Disease/Pest*** | ***5.87*** | ***0.84*** | ***83.84*** | ***Agree*** |  |

***# Strongly agree is from 100% to greater than 85.7%, agree is 85.6% to greater than 71.4%, and somewhat agree is less than 71.3% to greater than 57.1%.***

Table 6: The results of the domain experts' evaluation (Causal Agents category).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Question*** | ***Mean*** | ***SD*** | ***relative weight (%)*** | ***Degree#*** | ***Rank*** |
| CQ1 | 5.17 | 1.60 | 73.81 | Agree | 20 |
| CQ2 | 6.00 | - | 85.71 | Strongly agree | 10 |
| CQ3 | 5.33 | 0.82 | 76.19 | Agree | 19 |
| CQ4 | 5.86 | 0.90 | 83.67 | Agree | 15 |
| CQ5 | 5.86 | 0.90 | 83.67 | Agree | 15 |
| CQ6 | 6.00 | 1.07 | 85.71 | Strongly agree | 10 |
| CQ7 | 5.50 | 0.93 | 78.57 | Agree | 18 |
| CQ8 | 6.00 | 1.22 | 85.71 | Strongly agree | 10 |
| CQ9 | 6.00 | 1.15 | 85.71 | Strongly agree | 10 |
| CQ10 | 6.10 | 1.20 | 87.14 | Strongly agree | 9 |
| CQ11 | 6.40 | 0.70 | 91.43 | Strongly agree | 2 |
| CQ12 | 6.20 | 0.79 | 88.57 | Strongly agree | 6 |
| CQ13 | 6.50 | 0.71 | 92.86 | Strongly agree | 1 |
| CQ14 | 6.25 | 0.46 | 89.29 | Strongly agree | 4 |
| CQ15 | 6.13 | 0.35 | 87.50 | Strongly agree | 8 |
| CQ16 | 6.00 | 0.63 | 85.71 | Strongly agree | 10 |
| CQ17 | 6.25 | 0.46 | 89.29 | Strongly agree | 4 |
| CQ18 | 6.27 | 0.65 | 89.61 | Strongly agree | 3 |
| CQ19 | 5.75 | 0.46 | 82.14 | Agree | 17 |
| CQ20 | 6.18 | 0.60 | 88.31 | Strongly agree | 7 |
| ***Causal Agents*** | ***6.13*** | ***0.55*** | ***87.53*** | ***Strongly agree*** |  |

***# Strongly agree is from 100% to greater than 85.7%, agree is 85.6% to greater than 71.4%, and somewhat agree is less than 71.3% to greater than 57.1%.***

Table 7: The results of the domain experts' evaluation (Others category).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Question*** | ***Mean*** | ***SD*** | ***relative weight (%)*** | ***Degree#*** | ***Rank*** |
| CQ1 | 5.25 | 1.06 | 75.00 | Agree | 8 |
| CQ2 | 5.63 | 0.52 | 80.36 | Agree | 5 |
| CQ3 | 5.13 | 0.83 | 73.21 | Agree | 9 |
| CQ4 | 5.38 | 0.74 | 76.79 | Agree | 7 |
| CQ5 | 5.50 | 0.93 | 78.57 | Agree | 6 |
| CQ6 | 4.88 | 0.83 | 69.64 | Somewhat agree | 10 |
| CQ7 | 5.86 | 0.38 | 83.67 | Agree | 3 |
| CQ8 | 5.67 | 1.03 | 80.95 | Agree | 4 |
| CQ9 | 6.00 | 0.74 | 85.71 | Strongly agree | 1 |
| CQ10 | 6.00 | 0.89 | 85.71 | Strongly agree | 1 |
| ***Others*** | ***5.67*** | ***0.64*** | ***81.04*** | ***Agree*** |  |

***# Strongly agree is from 100% to greater than 85.7%, agree is 85.6% to greater than 71.4%, and somewhat agree is less than 71.3% to greater than 57.1%.***