SERA3 2025 IPM and Pest Priorities for the Southern Region

These priorities resulted from the March 3, 2025 meeting of the SERA3 members including the IPM coordinators from the southern region and invited members of other groups such as the IPM Centers. The priorities are a consensus document of the SERA3 IPM group.

Priority Listing Goal: Maintain and Enhance Public IPM Infrastructure
Criteria for Selection of IPM Priorities:

1. Strong stakeholder need
2. Addresses economic, environmental and/or human health issues
3. Priority is relevant to the Southern Region

The priorities listed below are major concerns to southern region IPM Coordinators. These needs and concerns should be communicated and emphasized to university administration, and state, territory, and federal government agencies.

- Continued university, state, territory and federal support for permanent IPM Specialists and maintenance/improvement of pest diagnostics labs
- Improve state and/or regional extension IPM staffing and capabilities
- Improve linkages and partnerships: commodity groups, pest control associations, crop advisors, government agencies (such as NIFA, USDA, NRCS, Housing Authority (HA), and HUD and other non-governmental groups)
- Enhance federal, state and territory support for extension IPM to advance IPM adoption
- Strengthen the capacity and capability of IPM professionals at universities
- Maintain Southern Region liaisons through the Southern IPM Center including IPM Coordinators, working groups, NGOs, other USDA programs, multi-state Hatch projects, IR-4, SARE, and others
- Support for training of private sector IPM professionals (e.g. crop advisors, crop scouts, pest control technicians, etc)
- Support for IPM training for county and regional extension personnels as well as Master Gardener Volunteers and private and public entities (e.g. neighborhood groups, schools, municipalities, etc)
- Support for IPM practices that protect pollinators and other beneficials
- Support for Spanish language IPM-training and materials development and distribution
- Support for beginning new farmers, small acreage farmers, and other communities looking for low-cost and less regulated products
- Support for urban agriculture and local food systems increasing need for organic IPM research and education

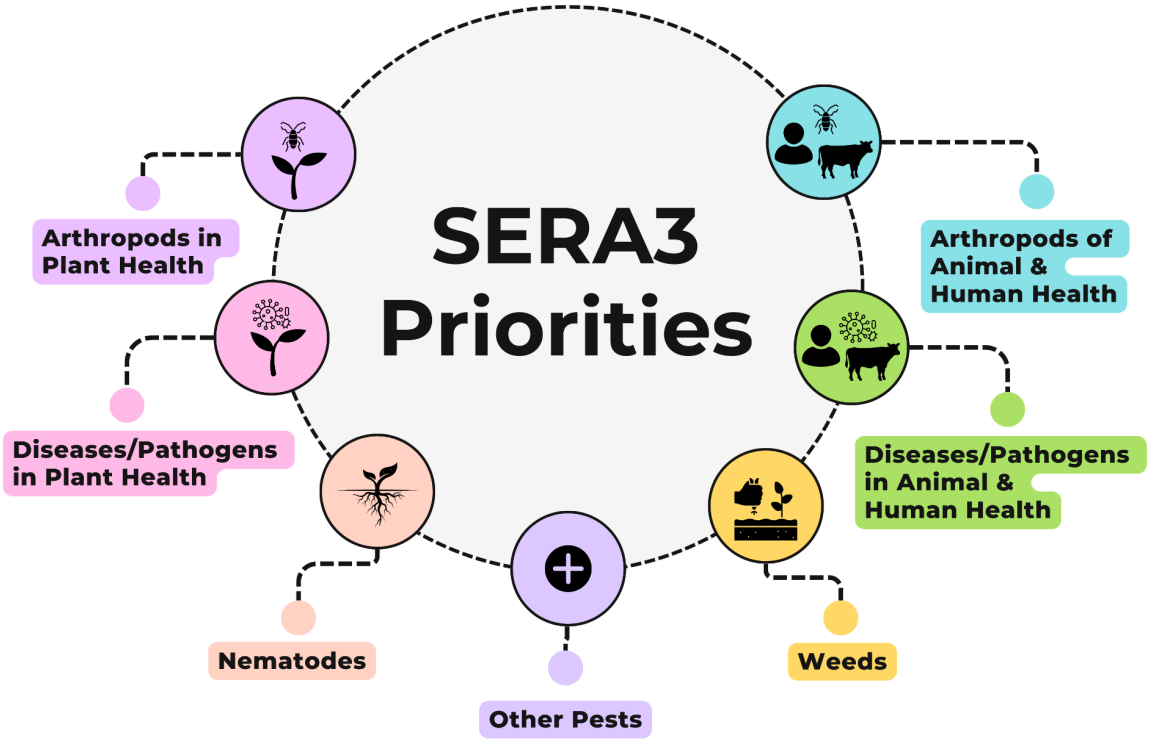
Projects that address critical IPM issues resulting from:

- Changes in agricultural system management (e.g. new technologies, etc)
- Pesticide resistance (chemical or GMO)
- Invasive pests (e.g. new pest associations, etc)
- Loss of management tools (e.g., due to changes in pesticide registration policies, including EPA's compliance with the Endangered Species Act)
- Environmental changes (e.g. waterways, agriculture influence on water quality, etc)
- Natural disasters (e.g. hurricane intensity, tornadoes, flooding, drought, etc)
- Weather variability (e.g. influence pest range expansion, etc)
- Host range expansion

Recommended reference: Adams, R., Almodovar, W., Bessin, R., Dreves, A., Faris, A., Frank, D., Held, D., Hurley, J., Kelly, H., Kerns, D., Leppla, N., Melanson, R., Reay-Jones, F., Seth Carley, D., Sial, A., Studebacker, G., Villegas. J., & Wise, K. (2025). SERA3 2025 IPM and Pest Priorities for the Southern Region. (T. Walker & K. Watson, Eds.) *Southern IPM Center.* https://southernipm.org/wp-content/uploads/2025/03/2025-Priorities-SERA3.pdf

PEST PRIORITIES

Due to the breadth of the agricultural systems and favorable environment of the Southern Region, the list of pests of importance is lengthy. Additional pests/issues may be present in the area or may arise. The top regional priorities for each pest group are listed prior to the comprehensive list of regional priorities.



Top Regional Priorities

*Pests and/or problems listed in this section have been ranked by IPM researchers within the Southern Region as the top priorities from among the comprehensive list of priorities from both the new, emerging, and important pests/issues and chronic/established pests/issues lists. *ESA approved common names are used except when one does not exist.*

Arthropods and Arthropod Issues in Plant Health:

- Thrips on fruits and flowers (e.g., *Thrips parvispinus, Frankliniella occidentalis, Frankliniella fusca*)
- Fall armyworm (*Spodoptera frugiperda*)
- Two-spotted spider mites (*Tetranychus urticae*)
- Stink bug complex (established) (Brown stink bug (*Euschistus servus*), Green stink bug (*Chinavia hilaris*), Southern green stink bug (*Nezara viridula*))

Arthropods and Arthropod Issues of Animal/Human Health:

- Varroa mite (*Varroa destructor*)

Recommended reference: Adams, R., Almodovar, W., Bessin, R., Dreves, A., Faris, A., Frank, D., Held, D., Hurley, J., Kelly, H., Kerns, D., Leppla, N., Melanson, R., Reay-Jones, F., Seth Carley, D., Sial, A., Studebacker, G., Villegas. J., & Wise, K. (2025). SERA3 2025 IPM and Pest Priorities for the Southern Region. (T. Walker & K. Watson, Eds.) *Southern IPM Center.* https://southernipm.org/wp-content/uploads/2025/03/2025-Priorities-SERA3.pdf

- Ticks, including Asian longhorned tick (*Haemaphysalis longicornis*), lone star (*Amblyomma americanum*), American dog (*Dermacentor variabilis*), Gulf coast (*A. maculatum*), black legged (*Ixodes scapularis*), and tropical bont tick (*A. variegatum*)

Diseases/Pathogens and Diseases/Pathogens Issues in Plant Health:

- Anthracnose of fruit crops (*Colletotrichum* spp.)
- *Xylella fastidiosa* diseases, including pecan bacterial leaf scorch, Pierce's disease of grape, and bacterial leaf scorch of blueberry
- Dollar spot of turfgrass (*Clarireedia* spp.)
- Neopestalotiopsis fruit rot and leaf spot of strawberry (*Neopestalotiopsis* sp.)

Diseases/Pathogens and Disease/Pathogen Issues in Animals/Human Health:

- Arthropod-borne diseases, including Dengue Fever, Chikungunya, Malaria, and West Nile Virus
- Avian influenza (AI), bird flu or fowl plague
- *Theileria orientalis* ikeda among cattle (transmitted by Asian longhorned tick)

Nematodes and Nematode Issues:

- Southern root-knot nematode (*Meloidogyne incognita*)

Weeds and Weed Issues:

- Pigweeds (*Amaranthus* spp.)
- Italian ryegrass (*Lolium perenne* L. ssp. *multiflorum*)
- Johnsongrass (*Sorghum halpense*)
- Yellow nutsedge (*Cyperus esculentus*)
- Morningglory (*Ipomoea* spp.)
- Purple nutsedge (*Cyperus rotundus*)

Other Pests and Pest Issues:

- Rodents, including house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), and roof rat (*Rattus rattus*)
- Feral hogs (*Sus scrofa* (feral type))

New, Emerging, and Important Pests/Issues

*Pests and/or problems listed in this section include domestic and introduced pests or issues as well as chronic or established pests/issues that are reemerging in one or more states within the Southern Region. Pests not yet introduced to the Region are not listed, however we acknowledge the importance of continued management and research of these pests that may cause economic losses if introduced. *ESA approved common names are used except when one does not exist.*

Arthropods and Arthropod Issues:

Arthropods in Animals/Human Health:

- Ants (invasive), including tawny crazy ant (*Nylanderia fulva*) and Asian needle ant (*Brachyponera chinensis*)
- Asian cockroach (*Blattella asahinai*)
- Face fly (*Musca autumnalis*)
- Horn fly (*Haematobia irritans irritans*)

- Invasive mosquitoes (*Culex coronator*, *C. lactator*)
- Ticks, including Asian longhorned tick (*Haemaphysalis longicornis*), lone star (*Amblyomma americanum*), American dog (*Dermacentor variabilis*), Gulf coast (*A. maculatum*), black legged (*Ixodes scapularis*), and tropical bont tick (*A. variegatum*)

Arthropods in Plant Health:

- Annual bluegrass weevil (*Listronotus maculicollis*)
- Bean flower thrips (*Megalurothrips usitatus*) in beans and other legumes
- Bagrada stink bug (*Bagrada hilaris*)
- Bermudagrass mite (*Eriophyes cynodoniensis*) and blueberry bud mite (*Acalitus vaccinii*)
- Bermudagrass stem maggot (*Atherigona reversura*)
- Billbugs in row rice, field corn, and turfgrass (sod farms and golf courses) (*Sphenophorus* spp.)
- Blueberry gall midge (*Dasineura oxycoccana*)
- Box tree moth (*Cydalima perspectalis*)
- Brown marmorated stink bug (*Halyomorpha halys*)
- Chilli thrips (*Scirtothrips dorsalis*)
- Corn leafhopper (*Dalbulus maidis*)
- Cotton leafhopper* (*Amrasca biguttula*)
- Cowpea curculio (*Chalcodermus aeneus*)
- Crane fly larvae in alfalfa (*Tipula* spp.)
- Crapemyrtle bark scale (*Eriococcus lagerstroemiae*)
- Cyclamen mites in strawberries (*Phytonemus pallidus*)
- Diamondback moth (*Plutella xylostella*)
- Emerald ash borer (*Agrilus planipennis*)
- Eriophyoid mites as agricultural and ornamental pests, including lychee erinose mite (*Aceria litchi*); *Acalitus simplex* on *Ruelias*; *Phyllocoptes wisconsinensis* on *Sambucus* spp.,
- European pepper moth (*Duponchelia fovealis*)
- Fruit flies (tropical), including oriental fruit fly (*Bactrocera dorsalis*), Mediterranean fruit fly (*Ceratitis capitata*), and Mexican fruit fly (*Anastrepha ludens*)
- Granulate ambrosia beetle in fruit trees and ornamentals (*Xylosandrus crassiusculus*)
- Hessian fly (*Mayetiola destructor*)
- Hibiscus bud weevil (*Anthonomus testaceosquamosus*)
- Hibiscus/Lebbeck mealybug (*Nipaecoccus viridis*)
- Old World bollworm (*Helicoverpa armigera*)
- Pepper weevil (*Anthonomus eugenii*)
- Planthopper (*Haplaxius crudus*)
- Redheaded flea beetle (not a ESA approved common name): *Systena frontalis* in container nurseries
- Scale insects (armored and soft) on ornamental plants: *Melanaspis* spp.*, Fiorinia* spp.*, Toumeyella liriodendri, Parthenolecanium quercifex, Saissetia coffeae*
- Spotted lanternfly (*Lycorma delicatula*)
- Whiteflies, including sweetpotato whitefly (*Bemisia tabaci*)
- Wood-boring beetles (several families) killing fruit, urban, and forest trees

Arthropod Issues:

- Insecticide resistance in western flower thrips (*Frankliniella occidentalis*) and tobacco thrips (*Frankliniella fusca*)
- Bt resistance in bollworm (*Helicoverpa zea*)

- Management of arthropods in hemp as a new crop with evolving pest complexes, including broad mite (*Polyphagotarsonemus latus*), hemp russet mite (*Aculops cannabicola*), two-spotted spider mite (*Tetranychus urticae*), cannabis aphid (*Phorodon cannabis*), rice root aphid (*Rhopalosiphum rufiabdominale*), yellow-striped armyworm (*Spodoptera ornithogalli*), and corn earworm (*Helicoverpa zea*)
- Management of acaricide resistant spider mite populations in ornamentals

Diseases/Pathogens and Disease/Pathogen Issues in Plant and Animal/Human Health:

Diseases/Pathogens in Animals/Human Health:

- Arthropod-borne diseases, including Dengue Fever, Chikungunya, Malaria, and West Nile Virus
- Avian influenza (AI), bird flu or fowl plague
- Eastern equine encephalitis (EEE), Venezuelan equine encephalitis (VEE) of horses (transmitted by mosquitoes)
- Pink eye of cattle (Infectious Bovine Keratoconjuctivitis) (transmitted by face fly)
- Rodent-borne diseases and transmissions (reportable), including murine typhus, leptospirosis, and hantavirus)
- *Theileria orientalis* ikeda among cattle (transmitted by Asian longhorned tick)

Diseases/Pathogens in Plant Health:

- Bacterial foliar diseases (*Xanthomonas* spp., *Pseudomonas* spp., and *Clavibacter* spp.) of tomato and pepper (need better management strategies in general)
- Bacterial leaf spot of crape myrtle (*Xanthomonas axonopodis*)
- Bacterial soft rot of peppers (*Pectobacterium carotovora*)
- Bacterial wilt in southern highbush and rabbiteye blueberry (*Ralstonia solanacearum*); and on sorrel (*Fusarium oxysporum).*
- Botrytis leaf blight of onion (*Botrytis squamosa*)
- Black rot of sweetpotato (*Ceratocystis fimbriata*)
- *Candidatus Phytoplasma brasiliense* in various crops
- Citrus diseases, including black spot (*Phyllosticta citricarpa*), citrus canker (*Xanthomonas citri* subsp. *citri*), citrus greening (Candidatus liberibacter asiaticus), and sweet orange scab (*Elsinoe australis*)
- Coffee Berry Rot (*Colletotrichum* spp.)
- Corn red stunt complex, including corn stunt spiroplasma (*Spiroplasma kunkelii*), maize bushy stunt phytoplasma (Candidatus phytoplasma asteris subgroup 16SrI-B), maize rayado fino virus (MRFV), and maize striate mosaic virus (MSMV)
- Cotton areolate mildew (*Ramulariopsis* spp.)
- Crown rot of corn (Fusarium spp.)
- Curvularia leaf spot of corn (*Curvularia lunata*)
- Dasheen Mosaic Virus (DsMV)
- Entomosporium leaf and fruit spot of blueberry (*Exobasidium maculosum*)
- Fusarium bud and head blight of hemp (*Fusarium graminearum*)
- Fusarium wilt of cotton (*Fusarium oxysporum* f. sp. *vasinfectum* race 4 (FOV4))
- Fusarium wilt of plantain/Banana (*Fusarium oxysporum* f. sp *cubense,* not Tropical Race 4 (Foc TR4))
- Fusarium wilt of watermelon (*Fusarium oxysporum* f. sp. *niveum*)
- Laurel wilt of woody plants (*Raffaelea lauricola*) [transmitted by red bay ambrosia beetle (*Xyleborus glabratus*)]
- Leaf dieback of pecan (*Neofusicoccum caryigenum*)

- Lethal bronzing of palms (*Phytoplasma palmae*)
- Lethal yellowing of palms (*Phytoplasma* sp.)
- Neopestalotiopsis fruit rot and leaf spot of strawberry (*Neopestalotiopsis* sp.)
- Phytophthora blight of cucurbits and peppers (*Phytophthora capsici*)
- Plectosporium blight of pumpkin (*Plectosporium tabacinum*)
- Root and crown rot of industrial hemp (*Pythium* spp*., Fusarium* spp*., Rhizoctonia* spp.)
- Root/crown rot, damping off, and soilborne diseases of vegetables (*Pythium* spp., *Fusarium* spp., *Rhizoctonia* spp., *Agroathelia* spp.)
- Rose rosette of roses (rose rosette virus, RRV)
- Sugarcane orange rust (*Puccinia kuehnii*)
- Tar spot of corn (*Phyllachora maydis*)
- Thousand canker disease (*Geosmithia morbida*) [transmitted by the walnut twig beetle (*Pityophthorus juglandis*)]
- Yam Rust (*Goplana dioscoreae*)
- Viruses in cucurbits, including cucumber green mottle mosaic virus (CGMMV) and melon severe mosaic virus (MSMV) and whitefly-transmitted viruses such as cucurbit leaf crumple virus (CuLCrV), cucurbit chlorotic yellows virus (CCYV), cucurbit yellow stunt disorder virus (CYSDV), squash vein yellowing virus (SqVYV), and watermelon chlorotic stunt virus (WmCSV)
- Viruses in southern highbush and rabbiteye blueberry, including necrotic ring blotch virus (BNRBV), red ringspot virus (BRRSV), blueberry scorch virus (BlSV), and blueberry shock virus (BlShV)

Disease/Pathogen Issues:

- Resistance to single-site mode of action fungicides, including in
    - Aerial blight of soybean and sheath blight of rice (*Rhizoctonia solani*)
    - Alternaria leaf spot of brassicas and head rot of broccoli (*Alternaria* complex)
    - Anthracnose of row crops, ornamentals, and small fruits (*Colletotrichum* spp.)
    - Brown rot of stone fruits (*Monilinia fructicola*)
    - Center rot of onion (*Pantoea ananatis*)
    - Cercospora blight and frogeye leaf spot of soybean (*Cercospora* spp.)
    - Gray mold of small fruits (*Botrytis cinerea*)
    - Late blight in solanaceous hosts (*Phytophthora infestans*)
    - *Pyricularia* spp. in ornamentals
    - Septoria brown spot (*Septoria glycines*)
    - Target spot (*Corynespora cassiicola*)
- Validated diagnostic protocols and controls for detection of endemic and exotic viruses in ornamentals, fruits, vegetables, and propagules for export
- Risk of *Ralstonia solanacearum* race 3 biovar 2 entering the food system (solanaceous crops) through the ornamental plant trade (geranium, rose)
- Risk of *Xylella fastidiosa* subsp. *pauca* introduction and spread to olive production in the southeast
- Risk of Fusarium wilt of banana (*Fusarium oxysporum* f. sp *cubense* Tropical race 4 (Foc TR4)) entering the U.S.

Nematodes and Nematode Issues:

Nematodes:

- Guava knot nematode (*Meloidogyne enterolobii*)

Weeds and Weed Issues:

Weeds:

- Ageratum (*Ageratum houstonianum*)
- Callery pear (*Pyrus calleryana*)
- Catclaw mimosa (*Mimosa pigra*)
- Cherokee sedge (*Carex cherokeensis*)
- Chinese privet (*Ligustrum sinense*)
- Cogongrass (*Imperata cylindrica*)
- Corn spurry (*Spergula arvensis* L.)
- Crested floating heart (*Nymphoides hydrophylla*) and other non-native Nymphoides
- Dallisgrass (*Paspalum dilatatum*)
- Foxtails (*Setaria parviflora*, *Setaria pumila*)
- Hairy crabweed (*Fatoua villosa*)
- Hydrilla (*Hydrilla verticillata*)
- Itchgrass (*Rottabellia cochinchinensis*)
- Juncus, Luzula (*Fimbristylis* spp.), and other rushes
- *Murdannia* spp.
- Praxelis (*Praxelis clematidea*)
- Shrubby false buttonweed (*Spermacoce verticillata*)
- Sweet acacia (*Vachellia farnesiana*)
- Tallow tree (*Triadica sebifera*)
- Wild radish (*Raphanus raphanistrum*)

Weed Issues:

- Glufosinate and dicamba resistance in Palmer amaranth (*Amaranthus palmeri*)
  Dicamba resistance in waterhemp (*Amaranthus tuberculatus*)
- Resistance to multiple modes of action and emergence of new resistances
- Proper/optimal integration of cover cropping within management programs
  Johnsongrass (*Sorghum halepense*) resistance to glyphosate in grain crops
- Development of new technologies and integration into operational aquatic weed management programs
- Management of aquatic weeds in flowing systems
- Ecological impacts of aquatic weeds

Other Pests and Pest Issues:

Other Pests:

- Jumping worm (*Amynthas* spp.)
- Hammerhead worms (*Bipalium* spp.)
- Cyanobacteria
- Filamentous cyanobacteria (*Microseira wollei*)
- Horntail snail (*Macrochlamys indica*)

Other Pest Issues:

- Ecological impacts of cyanobacteria, including algal blooms

Chronic/Established Pests/Issues

*Pests and/or problems listed in this section are known to occur in one or more states within the Southern Region and continue to be a problem on a regular basis. *ESA approved common names are used except when one does not exist.*

Arthropods and Arthropod Issues:

Arthropods of Animal/Human Health:

- Bed bugs (*Cimex lectularius*)
- Ceratopogonid biting midges
- Cockroaches, including the German cockroach (*Blattella germanica*) and American cockroach (*Periplaneta americana*)
- Indianmeal moth (*Plodia interpunctella*), webbing clothes moth (*Tineola bisselliella*) and the casemaking clothes moth (*Tinea pellionella*)
- Fleas affecting domestic pets
- Flies, including biting flies (horse and deer flies), black fly, cattle bot flies (*Hypoderma bovis*), horn fly (*Haematobia irritans*) on pastured cattle, house fly (*Musca domestica*) around poultry and dairy operations, and stable fly (*Stomoxys calcitrans*) on pastured and dairy cattle
- Imported fire ants (*Solenopsis* spp.)
- Lesser mealworm/darkling beetles (*Alphitobius diaperinus*) in broiler operations
- Lice on cattle, sheep, and goats
- Mosquitoes (*Aedes aegypti, Aedes albopictus, Culex* spp.)
- Northern fowl mite (*Ornithonyssus sylviarum*) on laying hens and breeder flocks
- Sheep keds on sheep and goats (*Melophagus ovinus*)
- Ticks affecting domestic pets and/or humans, including Asian longhorn tick, Lone Star tick, American dog tick, Gulf Coast tick, brown dog tick, and blacklegged tick
- Termites, including Formosan termites (*Coptotermes formosanus*), Reticulitermes termites (*Reticulitermes* spp.), and other native termites species
- Varroa mite (*Varroa destructor*)

Arthropods of Plant Health:

- Aphids on ornamental plants: *Tinocallis kahawaluokalani, Illinoia liriodendri, Aphis nerii*
- Ambrosia beetles
- Billbugs (*Sphenophorus spp.*)
- Bollworm (*Helicoverpa zea*)
- Broad mite (*Polyphagotarsonemus latus*)
- Burrower bug (*Pangaeus bilineatus*) (Peanut)
- Caterpillars (defoliating), including soybean looper (*Chrysodeixis includens*), velvetbean caterpillar (*Anticarsia gemmatalis*), and green cloverworm (*Hypena scabra*)
- Citrus leafminer (*Phyllocnistis citrella*)
- Cotton fleahopper (*Pseudatomoscelis seriatus*)
- Cowpea curculio (*Chalcodermus aeneus*)
- Diaprepes root weevil (*Diaprepes abbreviatus*)
- Fall armyworm (*Spodoptera frugiperda*)
- Ficus whitefly (*Singhiella simplex*)
- Flatheaded borers (Buprestidae) in ornamentals, fruits, and nuts

- Flea beetles (Tribe Alticini) in horticultural crops
- Giant stink bugs (family Tessaratomidae, genus *Piezosternum* of vegetables (beans, Cucurbits)
- Grasshoppers (*Melanoplus* spp.)
- Pecan weevil (*Curculio caryae*)
- Plum curculio (*Conotrachelus nenuphar*)
- Redbanded stink bug (*Piezodorus guildinii*)
- Rhodesgrass mealybug (*Antonina graminis*)(sod production/golf course)
- Rice stink bug (*Oebalus pugnax*)
- Russet mites (*Aculops spp.*)
- Scale insects (armored and soft scales), including cottony cushion scale (*Icerya purchasi*)
- Sesiid borer pests, including peachtree borer (*Synanthedon exitiosa*), lesser peachtree borer (*Synanthedon pictipes*), and grape root borer (*Vitacea polistiformis*)
- Sharpshooter/leafhopper vectors of *Xylella fastidiosa*
- Small hive beetle (*Aethina tumida*)
- Southern chinch bug (*Blissus insularis*)
- Spotted-wing drosophila (*Drosophila suzukii*)
- Stink bug complex (established) (Brown stink bug (*Euschistus servus*), Green stink bug (*Chinavia hilaris*), Southern green stink bug (*Nezara viridula*))
- Sugarcane aphid (*Melanaphis sacchari*)
- Sweet potato weevil (*Cylas formicarius*)
- Soybean looper (*Chrysodeixis includens*)
- Tarnished plant bug (*Lygus lineolaris*)
- Termites, including Formosan termites (*Coptotermes formosanus*), Reticulitermes termites (*Reticulitermes* spp.), and other native termites species
- Thrips on fruits and flowers (e.g., *Thrips parvispinus, Frankliniella occidentalis, Frankliniella fusca*)
- Tile-horned prionus root borer in pecan (*Prionus imbricornis*)
- Tobacco thrips (*Frankliniella fusca)*
- Tuttle mealybug in turfgrass (*Brevennia rehi*)
- Two-spotted spider mites (*Tetranychus urticae*)
- Virus vectors (multiple aphid, thrips, and whitefly species)
- Wireworms
- White grubs
- Yellow margined leaf beetles (*Microtheca ochroloma*)

Arthropod Issues:

- Delusional infestations
- Asthma and allergic reactions relate to German cockroaches, Asian needle ants, and carpet beetles
- Support Community IPM Programs in school, structural, public housing, home, and landscape
- Insecticide resistance in alfalfa weevil (*Hypera postica*), southern chinch bugs
- Over reliance on insecticides in ornamentals
- Over reliance on insecticides and lack of varied pest management tactics for control of sucking insect pests of soybean, cotton, corn, vegetables, fruit, (scales, thrips, whiteflies, stink bugs, mirids, Lygus) and sap-feeding insect pests of turfgrass
- Conventional pest management practices in turf and ornamental systems largely disregard biological variability

- Insecticide resistance of mosquitoes

Diseases/Pathogens and Disease/Pathogen Issues:

Diseases/Pathogens of Animal/Human Health:

- Chagas disease (*Trypanosoma cruzi*) transmitted by kissing bugs (Subfamily Triatominae)
- Texas cattle fever (*Babesia bovis*) transmitted by cattle tick (*Rhipicephalus annulatus*) and southern cattle tick (*Rhipicephalus microplus*)
- Dog Heartworm in dogs and cats (*Dirofilaria immitis*)

Diseases/Pathogens of Plant Health:

- Anthracnose of fruit crops (*Colletotrichum* spp.)
- Armillaria root rot of peach (*Armillaria tabescens*)
- Aspergillus ear rot (*Aspergillus* sp.)
- Bacterial blight of brassicas (*Pseudomonas cannabina* pv. *alisalensis*)
- Bacterial blight of cotton (*Xanthomonas axonopodis* pv. *malvacearum*)
- Bacterial spot of peach (*Xanthomonas arboricola*)
- Bitter rot of apples (*Colletotrichum* spp.)
- Black rot of brassica (*Xanthomonas campestris* pv. *campestris*)
- Black leg of potato (*Dickeya* spp.)
- Boxwood blight of boxwood (*Calonectria pseudonaviculata*)
- Center rot of onions (*Pantoea* spp.) [transmitted by thrips]
- Cucumber mosaic virus (CMV) [transmitted by aphids]
- Dollar spot of turfgrass (*Clarireedia* spp.)
- Downy mildew of cucurbits (*Pseudoperonospora cubensis*)
- Early blight of tomato (*Alternaria linariae*)
- Fire blight (*Erwinia amylovora*)
- Fusarium ear rot of corn (*Fusarium verticillioides*)
- Fusarium head blight of wheat & barley (*Fusarium graminearum*)
- Fusarium wilt of tomato (*Fusarium oxysporum* f.sp. *lycopersici*)
- Gummy stem blight of cucurbits (*Stagonosporopsis cucurbitacearum S. caricae*, and *S. citrulli*)
- Late leaf spot of peanut (*Nothopassalora personata*)
- Pecan scab (*Venturia effusa*)
- Phytophthora fruit and crown rot of vegetables (*Phytophthora* spp.)
- Powdery mildew of cucurbits (*Podosphaera xanthii*, *Golovinomyces cichoracearum*, and others)
- Rhizopus soft rot of sweetpotato (*Rhizopus stolonifer*)
- Rusts in wheat, including leaf rust (*Puccinia triticina*) and stripe rust (*Puccinia striiformis* var. *tritici*)
- Southern blight (*Agroathelia rolfsii*)
- Southern corn rust (*Puccinia polysora*)
- Sweetpotato viruses, including sweet potato leaf curl virus (SPLCV), sweet potato feathery mottle virus (SPFMV), sweet potato virus G (SPVG), sweet potato virus C (SPVC), and sweet potato virus 2 (SPV2)
- Target spot in cotton (*Corynespora cassiicola*)
- Tomato spotted wilt virus (TSWV) and other tospoviruses [transmitted by Western flower thrips (*Frankliniella occidentalis*)]
- Tomato yellow leaf curl virus (TYLCV) [transmitted by whiteflies]
- *Xylella fastidiosa* diseases, including pecan bacterial leaf scorch, Pierce's disease of grape,

and bacterial leaf scorch of blueberry
- Zebra chip of potato (*Candidatus* Liberibacter solanacearum)

Disease/Pathogen Issues in Plant Health:

- Soilborne pathogens of speciality crops not effectively managed by currently available/approved fumigants
- Resistance to single-site mode of action fungicides, including in:
    - Gummy stem blight of watermelon (*Stagonosporopsis cucurbitacearum*, *S. caricae*, and *S. citrulli*)
- Pesticide resistance in *Xanthomonas* spp. (bacterial spot of tomato)
- Aflatoxin contamination in corn and peanut

Nematodes and Nematode Issues:

Nematodes:

- Southern root-knot nematode (*Meloidogyne incognita)*
- Reniform nematode (*Rotylenchulus reniformis*)
- Sting nematode (*Belonolaimus longicaudatus*)
- Stubby root nematodes (*Trichodoridae* family)

Nematode Issues:

- Plant parasitic nematode management (e.g., threshold development and lack of nematicides, etc.)

Weeds and Weed Issues:

Weeds:

- Annual bluegrass (*Poa annua*)
- Aquatic weeds, including alligatorweed (*Alternanthera philoxeroides*), giant salvinia (*Salvinia molesta*), waterhyacinth (*Eichornia crassippes*), and water lettuce (*Pistia stratiotes*)
- Brunswickgrass (*Paspalum nicorae*)
- Buttercup (*Ranunculus* spp.)
- Carolina geranium (*Geranium carolinianum*)
- Chickweed (*Stellaria media*)
- Citron melon (*Citrullus lanatus*)
- Climbing mimosa (*Mimosa casta)*
- Cogongrass (*Imperata cylindrica*)
- Crabgrass (*Digitaria* spp.) and other annual grasses
- Curly dock (*Rumex crispus*)
- Cutleaf evening primrose (*Oenothera laciniata*)
- European black nightshade (*Solanum nigrum*)
- Foxtail (Alopecurus spp.)
- Goosegrass (*Eleusine indica*)
- Greenbrier (*Smilax* spp.)
- Italian ryegrass (*Lolium perenne* L. ssp. *multiflorum*)
- Japanese climbing fern (*Lygodium japonicum*)
- Japanese honeysuckle (*Lonicera japonica*) and bush honeysuckle (*Lonicera maackii*)
- Johnsongrass (*Sorghum halpense*)

- Kudzu (*Pueraria montana*)
- Lead tree (*Leucaena leucocephala*)
- Lesser swinecress (*Coronopus didymus*)
- Morningglory (*Ipomoea* spp.)
- Old World climbing fern (*Lygodium microphyllum*)
- Perennial woody species in pastures and hay fields
- Pigweeds (*Amaranthus* spp.)
- Poison hemlock in pastures/hay fields (*Conium maculatum*)
- Purple nutsedge (*Cyperus rotundus*)
- Purslane (*Portulaca oleracea*)
- Ragweed (*Ambrosia* spp.)
- Ragweed parthenium (*Parthenium hysterophorus*)
- Sicklepod (*Senna obtusifolia*)
- Smut grass (*Sporobolus* spp.)
- Thistles
- Tropical soda apple (*Solanum viarum*)
- Vaseygrass (*Paspalum urvillei*)
- Yellow nutsedge (*Cyperus esculentus*)
- Venezuelan grass (*Paspalum fasciculatum)*

Weed Issues:

- Untimely applications of herbicides
- Lack of irrigation or rain to activate residual herbicides
- Herbicide injury to susceptible crops is common.
- Cost and lack of labor for hand weeding
- Excessive tillage cultivation in organic horticulture crops that do not use cover crops
- Lack of autonomous weed control implements
- Plasticulture is very effective but cost (labor and supplies) and plastic contamination cause economic and environmental challenges.
- Lack of weed control options during pasture establishment.
- Field evaluation of interseeding for weed management of tropical pastures
- Herbicide resistance in weeds, including:
    - *Amaranthus* spp., including Palmer amaranth (*A. palmeri*), water hemp (*A. rudis*), and spiny amaranth (*A. spinosus*), resistance to multiple herbicides
    - Glyphosate resistance in common ragweed (*Ambrosia artemisiifolia*) and Parthenium ragweed (*Parthenium hysterophorus*)
    - Yellow nutsedge (*Cyperus esculentus*) resistance to ALS inhibitors
    - Barnyardgrass (*Echinochloa crus-galli*) resistance to multiple herbicides
    - Common cocklebur (*Xanthium strumarium*) resistance to multiple herbicides
    - Goosegrass (*Eleusine indica*) resistance to multiple herbicides
    - Horseweed/marestail (*Erigeron canadensis*) resistance to multiple herbicides, including glyphosate and paraquat
    - Italian ryegrass (*Lolium multiflorum*) resistance to multiple herbicides
    - Johnsongrass (*Sorghum halepense*) resistance to multiple herbicides
    - Rice flatsedge (*Cyperus iria*) resistance to multiple herbicides
    - Water hemp (*Amaranthus rudis*) resistance to multiple herbicides
    - Potential to develop resistance to Auxin herbicides with increasing use of Dicamba and 2,4-D

Other Pests and Pest Issues:

Other Pests:

- Coyotes (*Canis latrans*)
- Deer
- Feral hogs (*Sus scrofa* (feral type))
- Green iguana (*Iguana iguana*)
- Pythons (*Python* spp.)
- Rodents, including house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), and roof rat (*Rattus rattus*)
- Slugs
- Snails, including giant African snails (*Lissachatina fulica*)
- Voles (*Microtus* spp.)
- Vultures

Projects that focus on development and implementation of IPM Systems. (e.g. Livestock, Agronomic and Horticultural Crops, Non-Cropland, Urban/Schools)

- Ecological approaches
- Crop level approaches (projects that focus on single crop IPM systems)
- Farmscape approaches (projects that focus on multi-cropping systems within a farmscape to address significant management issues, e.g., stink bug management in a multi-crop landscape)
- Explore new technologies (remote sensing) to precisely scout/inspect for weeds in large fields, sports turf, golf courses
- Development of new detection/mapping techniques and alternative strategies for invasive weed species
- Establishing thresholds in pasture-based systems
- Herbicide movement and off-target impacts
- Projects that focus on developing harvest weed seed control strategies
- Projects that develop IPM system components (e.g., least toxic options, novel management techniques, action thresholds, cover crops).
- Projects that develop IPM programs for emerging crops
- Projects that develop IPM programs to protect beneficial insects (natural enemies, pollinators) in agricultural and urban landscapes
- Projects that focus on pesticide safety and applicator training
- Projects that address long term cost/benefit of IPM implementation. Often, sound IPM practices are ignored as a result of perceived short-term economic gain without consideration of long term economic, environmental, or human health detriments. Projects are needed to bridge this disconnect.
- Projects that focus on education and demonstration of the value of scientific decision making in IPM to consumers, growers and producers. The most recent need for this is the use of pesticides to correct unspecified “plant health problems” without known pest presence. This specific problem undermines the foundation of IPM and opens the door for further problems.
- Public breeding programs that advance host resistance as a core method within IPM systems
- Projects that deploy technologies that detect plant pathogens earlier. Technologies include but are not limited to: UAVs, volatile sensing, microneedle patches, remote sensing using molecular tools in the field, and similar technologies
- Projects that focus on training pest control professionals

- Projects that provide IPM training and information on structural pests to the general public
- Projects that produce clean plants
- Projects that focus on IPM strategies for organic growers (commercial and homeowners) for vegetable insect pests
- Demonstrating non-chemical based weed control for specialty crop growers and consumers.
- Understand weed biology, ecology, soil seed bank, germination pattern, growth habit, etc., as affected by different management strategies and weather variability
- Public awareness of pest impacts and benefits of management

IPM Evaluation

Projects that focus on implementation of evaluation tools for IPM programs to help produce outcomes with value to the public – (outcomes likely to produce positive economic, environmental and human health benefits). Projects may focus on increasing training and implementation of existing evaluation tools, or may develop new evaluation tools for IPM personnel. Ultimately, evaluation projects should be used to document the value of new and existing IPM projects and programs. Projects that improve delivery of IPM information by:

- Creating new or updating existing resources to address stakeholder needs
- Pest management strategic plans, crop profiles
- Websites, webinars, social media events, and other online training tools
- Smartphone and tablet apps
- Decision support tools (in English and Spanish)
- Pest ID guides (electronic and printed in English and Spanish)
- Infographics for public distribution (multiple languages)
- Develop and improve communication methods to educate all stakeholders (applicators, consumers, builders, architects, schools, etc.) on IPM practices for weeds, arthropods, and diseases (including appropriate use of pesticides: when, where, how to apply)
- Developing new or improving/implementing existing programs
- Distance education
- Improved resources/trainings for agents and specialists to evaluate IPM programs
- Real time pest/disease/biocontrol monitoring and IPM decision support, such as AgPestMonitor (https://agpestmonitor.org)
- IPM demonstrations
- Resources to support continued development of IPM Database and connected resources with uniform terminology (e.g., pest names) can data formats so all extension IPM recommendations can pull in up-to-date labels for registered products in real time when stakeholders access online recommendations.
- Improved mechanisms for quickly alerting all stakeholders (agents, specialists, etc.) regarding pest issues