Category Manuals Needed

for implementation of the revised Certification & Training (C&T) rule for pesticide applicators 40 CFR Part 171, revised 2017

On July 18, 2022, CTAG met in person in Buffalo, New York, and discussed the status of training materials for pesticide applicators seeking category certifications such as “right-of-way” and “fumigation.” Some categories apply to both private applicators (i.e. landholders) and commercial applicators.

What actions are recommended?

1. CTAG should create a document called “Status of Category Manuals” and house it on the CTAG website. This document would be updated on a schedule, describing the manual(s) currently in use, their age and availability for shared use.
2. There should be a central location for shared manuals/exams that is accessible to all educators/regulators with relevant responsibilities. Perhaps with funding from PRIA and/or the National Stakeholder Team, this collection could house training content in a variety of formats (i.e. Microsoft Word, images, and professionally formatted items).
3. There should be a new document comparing old and new competencies for private and commercial categories, similar to PERC’s “Meeting Competency Standards” for the core (not category) competencies. It could serve as a starting point when writing/updated training materials to meet the new standards. It could expand federal competencies into a deeper outline.

Why now?

1. We see a need for more national/regional manuals than existed in the past because:
    a. The revised C&T rule created a more prescriptive set of national competencies.
    b. It’s necessary to reduce burdens on individual programs (agencies, universities) with resource constraints. Building a strong manual/exam is a large project.
2. An opportunity exists to get on a ten-year schedule for updating all or most manuals that serve national/regional audiences. As EPA approves plans from each certifying authority and those plans go into implementation, we are all facing a “reset” in 2022-2024.

What next?

1. CTAG members are doing research on the status of category manuals, planning to share the results online and in live webinars. CTAG aims to bring potential collaborators together, help them initiate development efforts, and provide support as needed.
2. Stay tuned for opportunities to get involved!

CTAG members are doing research on the status of category manuals, as follows:

Ag plant pest control –	Kaci Buhl
Ag livestock pest control –	John Feagans
Forest pest control –	John Feagans
Ornamental & Turf -	Linda Johns
Aquatic pest control –	Brett Bultemeier
Right-of Way pest control –	Neil Kittleson
Industrial, Institutional, Structural	Kaci Buhl
Public Health pest control –	Brett Bultemeier
Regulatory pest control –	Amanda Couture
Demo & Research –	Neil Kittleson
Sodium cyanide –	Stephen Vantassel
Sodium fluoroacetate –	Linda Johns
Wood preservatives –	Lindsey House
Antimicrobial Pesticides –	Gurinderbir Chahal
Natural areas –	Brett Bultemeier
Marine antifouling –	Amanda Couture
Sewer root control –	Gurinderbir Chahal
Interior plantscapes –	Lindsey House

Not assigned/researched:
Seed treatment – Not assigned – A recent manual from PERC is available.
Soil fumigation – Not assigned- PERC has committed to updating this manual.
Non-soil fumigation – A recent manual from PERC is available.
Aerial pest control – Not assigned – PERC may update existing national manual/exam.

Agricultural Crop Pest Control	
Federal category for commercial applicators	
Are any existing manuals/exams available?	There is no national standard manual nor any widely-adopted version.
Research notes: - Anything identified in the AAPCO survey? - What did you find online, and/or contacting others?	Summary findings: - AAPCO survey: 27% said they need updated materials; 45% said they might need them. - Lots of variation in lumping/splitting - Lots of variation in cropping systems/emphasis - Utah manual (2001) online here, includes some “core” type content (47 pages). - The Kentucky manual (2015) is available online (20 pages). - The Georgia manual is not available in pdf, but it’s dated 2018 (57 pages).
How many states/tribes use this category?	All states/tribes/territories use this category because it is federally-required. However, there’s a great

	deal of variation in the approach to lumping/splitting this category.
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	Crop pests are crop-specific. This category manual is likely to vary widely from region to region.
How is the category lumped with other categories and/or split into several categories?	"Agricultural Crop/Plant pest control" is the most common category name for this category. This category is often split up into smaller categories such as: - Ag plant diseases, Ag weeds, and Ag insects… (several states) - Row crops vs. Tree crops… (FL) - Fruit, Veg, vs. Field crops (IL) - Agronomic pest control vs. Horticultural pest control. (OH) This category is lumped with Ornamental & Turf by Illinois and Puerto Rico in a category called "Plant Pest Control."
The new competencies are described in 40 CFR Part 171.103(d)(1)(i)	***Crop pest control.*** Applicators must demonstrate practical knowledge of crops, grasslands, and non-crop agricultural lands and the specific pests of those areas on which they may be using restricted use pesticides. …. The required knowledge includes pre-harvest intervals, restricted entry intervals, phytotoxicity, potential for environmental contamination such as soil and water problems, non-target injury, and other problems resulting from the use of restricted use pesticides in agricultural areas. The required knowledge also includes the potential for phytotoxicity due to a wide variety of plants to be protected, for drift, for persistence beyond the intended period of pest control, and for non-target exposures.
Are there emerging regulations or science in this area?	As a result of climate change, cropping systems are shifting north and invasive species/pathogens are infesting new areas. Pest management practices have changed a great deal in the past 10-20 years, including methods for pest surveillance, using biopesticides with precise time requirements, and genetically modified cropping systems and resistance.
Are there opportunities to reduce duplication of effort?	Within regions that share similar cropping systems and diversity, states/tribes/territories may benefit from partnering. Select neighboring states/tribes/territories with aligning category(ies).

Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	This category content is unique because it's very similar for commercial applicators (as a category or categories) and for private applicators (as newly required core content). See 40 CFR Part 170.105(a)(11). The majority of certified pesticide applicators will be exposed to some or all of this content. If a strong set of core content was developed and shared with states/tribes/territories for customization, it could represent a huge opportunity to address label complexities in agriculture, herbicide drift/volatility in agriculture, inversions, food residue issues in agriculture, and FSMA crossover topics.
Category required for applicators as described in 40 CFR Part 171.103(a)(1)	***Crop pest control.*** This category applies to commercial applicators who use or supervise the use of restricted use pesticides in production of agricultural commodities, including but not limited to grains, vegetables, small fruits, tree fruits, peanuts, tree nuts, tobacco, cotton, feed and forage crops including grasslands, and non-crop agricultural lands.
Researched/summarized by CTAG member Kaci Buhl	

Summary (1-3 paragraphs): Ag Crop Pest Control

There is no national manual nor any widely-adopted version(s). This category manual is likely to vary widely from region to region because it is focused on crop-specific pests. In a recent AAPCO survey, 27% of certifying authorities said they need new or updated training materials for this category, and 45% said they might need updated materials to meet new competency requirements. It ranked 3rd in category priorities. Within regions that share similar cropping systems and diversity, states/tribes/territories may benefit from partnering. They should seek out neighboring states/tribes/territories with aligning category(ies).

All states/tribes/territories use this category because it is federally required. However, there's a great deal of variation in the approach to lumping/splitting this category. "Agricultural Crop/Plant pest control" is the most common category name for this category. This category is lumped with Ornamental & Turf by Illinois and Puerto Rico in a category called "Plant Pest Control." This category is often split into smaller categories such as:

- Ag plant diseases, Ag weeds, and Ag insects… (several states)
- Row crops vs. Tree crops… (FL)
- Fruit, Veg, vs. Field crops (IL)
- Agronomic pest control vs. Horticultural pest control (OH)

This category content is unique because it's very similar for commercial applicators (as a category or categories) and for private applicators (as newly required core content). See 40 CFR Part 170.105(a)(11). In the future, the majority of certified pesticide applicators will be exposed to some or all of this content (Ag-plant). If a strong set of "Ag-Plant" content was

developed and shared with states/tribes/territories for customization, it could provide an opportunity to address label complexities in agriculture, herbicide volatility in agriculture, food residue issues in agriculture, and FSMA crossover topics. These topics fall within required competencies.

Agricultural Livestock Pest Control	
Federal category for commercial applicators	
Are any existing manuals/exams available?	
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	
How many states/tribes use this category?	
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	
How is the category lumped with other categories and/or split into several categories?	
The new competencies are described in 40 CFR Part 171.103(d)(1)(ii)	***Livestock pest control.*** Applicators must demonstrate practical knowledge of such animals and their associated pests. The required knowledge includes specific pesticide toxicity and residue potential, and the hazards associated with such factors as formulation, application techniques, age of animals, stress, and extent of treatment.
Are there emerging regulations or science in this area?	
Are there opportunities to reduce duplication of effort?	
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	
Category required for applicators as described in 40 CFR Part 171.103(a)(2)	***Livestock pest control.*** This category applies to commercial applicators who use or supervise the use of restricted use pesticides on animals or to places on or in which animals are confined.
Researched/summarized by CTAG member John Feagans	

Summary (1-3 paragraphs):

Forest Pest Control	
Federal category for commercial applicators	
Are any existing manuals/exams available?	
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	
How many states/tribes use this category?	
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	
How is the category lumped with other categories and/or split into several categories?	
The new competencies are described in 40 CFR Part 171.103(d)(2)	***Forest pest control.*** Applicators must demonstrate practical knowledge of types of forests, forest nurseries, and seed production within the jurisdiction of the certifying authority and the pests involved. The required knowledge includes the cyclic occurrence of certain pests and specific population dynamics as a basis for programming pesticide applications, the relevant organisms causing harm and their vulnerability to the pesticides to be applied, how to determine when pesticide use is proper, selection of application method and proper use of application equipment to minimize non-target exposures, and appropriate responses to meteorological factors and adjacent land use. The required knowledge also includes the potential for phytotoxicity due to a wide variety of plants to be protected, for drift, for persistence beyond the intended period of pest control, and for non-target exposures.
Are there emerging regulations or science in this area?	
Are there opportunities to reduce duplication of effort?	
Are there critical items or methods needed to ensure accuracy/quality?	

Are there tripping hazards on the path to adopting the new/revised manual?	
Category required for applicators as described in 40 CFR Part 171.103(b)	***Forest pest control.*** This category applies to commercial applicators who use or supervise the use of restricted use pesticides in forests, forest nurseries and forest seed production.
Researched/summarized by CTAG member John Feagans	

Summary (1-3 paragraphs):

Ornamental & Turf Pest Control	
Federal category for commercial applicators	
Are any existing manuals/exams available?	
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	-9 yes/17 maybe/22 no - review of online O&T materials from states identifying as needing a new manual, and how they are distinct from a typical O&T category is below - Utah's manual is online. - an online search of Yakima Nation provided results for WA state (may piggyback)
How many states/tribes use this category?	-all, required by new regs
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	-regional is likely best due to differences in seasonality, plants, maintenance, pests, water, etc.
How is the category lumped with other categories and/or split into several categories?	- Ornamental and Turf is 2 categories - IN - Pests and Weeds is 2 categories - NM, OR, WA - Golf Course category - KY - Greenhouse pests are a separate manual - IA
The new competencies are described in 40 CFR Part 171.103(d)(3)	***Ornamental and turf pest control.*** Applicators must demonstrate practical knowledge of pesticide problems associated with the production and maintenance of ornamental plants and turf. The required knowledge includes the potential for phytotoxicity due to a wide variety of plants to be protected, for drift, for persistence beyond the intended period of pest control, and for non-target exposures. Because of the frequent proximity of human habitations to application activities,

	applicators in this category must demonstrate practical knowledge of application methods that will minimize or prevent hazards to humans, pets, and other domestic animals.
Are there emerging regulations or science in this area?	lots of biological and 25(b) products, as well as consumer awareness related to pollinator protection, and human health considerations..
Are there opportunities to reduce duplication of effort?	yes, as some things are consistent across the country such as protection of human health and the environment; application methods; drift/chemical trespass; pest life stages
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	Some states do have preemption regulations that require/do not allow the use of certain active ingredients or sites - this is a sticky area and will have to be determined at the individual state level how to address..
Category required for applicators as described in 40 CFR Part 171.103(c)	***Ornamental and turf pest control.*** This category applies to commercial applicators who use or supervise the use of restricted use pesticides to control pests in the maintenance and production of ornamental plants and turf.
Researched/summarized by CTAG Exec Sec Amy Sullivan	

Summary (1-3 paragraphs):

Aquatic Pest Control	
Federal category for commercial applicators	
Are any existing manuals/exams available?	NPSEC has an aquatic manual, unclear if truly national or specific to midwest (no national exam). Many state manuals.
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	There is great interest in “regional” versions of an aquatic manual. Florida is doing a Florida manual and in discussion with others plans to write a ‘national’ template with notes for regional variance. Expertise at the center for aquatic and invasive plants AND the UF pesticide information office will help facilitate a robust manual (housed in the same research center)
How many states/tribes use this category?	all (though some merge/split differently)
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	Regional is possible and likely desired. Each region is somewhat unique in pests and types of sites, but lots of overlap. Regional seemed very well received and most states are likely to add very little of their own to the regional model.

How is the category lumped with other categories and/or split into several categories?	Mosquito, antifouling and sewer root sometimes lumped. Most common on its own.
The new competencies are described in 40 CFR Part 171.103(d)(5)	***Aquatic pest control.*** Applicators must demonstrate practical knowledge of the characteristics of various aquatic use situations, the potential for adverse effects on non-target plants, fish, birds, beneficial insects and other organisms in the immediate aquatic environment and downstream, and the principles of limited area application.
Are there emerging regulations or science in this area?	NPDES rule changes, new invasive species
Are there opportunities to reduce duplication of effort?	Yes
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	Ensuring proper capture of regional, or even state pest species. CAIP at UF well connected to national experts for reviews in each region.
Category required for applicators as described in 40 CFR Part 171.103(e)	***Aquatic pest control.*** This category applies to commercial applicators who use or supervise the use of any restricted use pesticide purposefully applied to standing or running water, excluding applicators engaged in public health related activities included in as specified in paragraph (h) of this section.
Researched/summarized by CTAG member Brett Bultemeier	

Summary (1-3 paragraphs):

There was almost universal interest in a national manual, that is modified minimally for each region. The idea is to have 90% of the material the same, but alter the pests and some treatment sites to better fit each region. Several PSEPS in each region volunteered to review during the process and gather information relevant to their region. Many expressed a desire because there are applicators in their state, but very little true expertise. Florida is unique in that an entire research center is devoted to aquatic plant management. At the center there are 4 full time faculty devoted to that endeavor, a federal US Army Corps of Engineer researcher stationed on site, the PSEP for Florida on site, all collaborating together. Florida has more aquatic applicators than any other state, so will be doing a manual regardless, but with my involvement are happy to additionally prepare regional support as well.

Right-of-way Pest Control	
Federal category for commercial applicators	
Are any existing manuals/exams available?	
Research notes:	

- Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	
How many states/tribes use this category?	
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	
How is the category lumped with other categories and/or split into several categories?	
The new competencies are described in 40 CFR Part 171.103(d)(6)	***Right-of-way pest control.*** Applicators must demonstrate practical knowledge of the types of environments (terrestrial and aquatic) traversed by rights-of-way, recognition of target pests, and techniques to minimize non-target exposure, runoff, drift, and excessive foliage destruction. The required knowledge also includes the potential for phytotoxicity due to a wide variety of plants and pests to be controlled, and for persistence beyond the intended period of pest control.
Are there emerging regulations or science in this area?	
Are there opportunities to reduce duplication of effort?	
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	
Category required for applicators as described in 40 CFR Part 171.103(f)	***Right-of-way pest control.*** This category applies to commercial applicators who use or supervise the use of restricted use pesticides in the maintenance of roadsides, powerlines, pipelines, and railway rights-of-way, and similar areas.
Researched/summarized by CTAG member Neil Kittleson	

Summary (1-3 paragraphs):

Industrial, Institutional, and Structural (IIS) Pest Control
Federal category for commercial applicators

Are any existing manuals/exams available?	There is no national manual nor any widely adopted version(s). Several states/tribes/territories have their own manuals/exams, and some share with a few neighboring states (i.e. WA/OR).
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	AAPCO survey shows two respondents working on (or recently finished) this manual. - Ohio just completed a new manual/exam. (contact Mary Rose **rose.155@osu.edu**): Broken out into 'general' and 'termite') Very pest-driven with some 'bonus' (core) content - California is updating their content now (Alicia Scott at CDPR: **alicia.scott@cdpr.ca.gov**) Broader, with more principles/pests Georgia is using a manual from 1996. Oregon is using a college textbook, ***Truman's Scientific Guide to Pest Control***, wanting to replace it as soon as possible.
How many states/tribes use this category?	All states/tribes/territories use this category because it is federally required. However, there's a great deal of variation in the approach to lumping/splitting this category.
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	Pests associated with human habitat vary from north to south with respect to termites, fire ants, and several other pests. Wildlife pests vary widely from region to region, including more burrowing rodents in the west, more avian nuisance in the northeast. However, some content related to pesticide applications in indoor/sensitive settings is likely to be widely applicable nationwide.
How is the category lumped with other categories and/or split into several categories?	Some certifying authorities lump with structural fumigation and/or public health pest control. Some split out: - Structural pests (WDO) as a category - Moss control (sub-IIS) - Rodent control (sub-IIS) - Wildlife control (sub-IIS) - Termites (sub-IIS) A few lump with right-of-way into a category called "Industrial Weed Management" (MS and OH).
The new competencies are described in 40 CFR Part 171.103(d)(7)	***Industrial, institutional, and structural pest control.*** Applicators must demonstrate a practical knowledge of industrial, institutional, and structural pests, including recognizing those pests and signs of their presence, their habitats, their life cycles, biology, and behavior as it may be relevant to problem identification and control. Applicators must demonstrate practical knowledge of types of formulations appropriate for control of industrial, institutional and structural pests, and methods of

	application that avoid contamination of food, minimize damage to and contamination of areas treated, minimize acute and chronic exposure of people and pets, and minimize environmental impacts of outdoor applications.
Are there emerging regulations or science in this area?	- There have been changes in the registration of pyrethroids that have broad relevance – for example, defining the "crack & crevice" method. - There is new science about older peoples' sensitivity to pesticide exposure, making a new array of sensitive sites. - Communication skills have proven to be essential in preventing pesticide impacts – post-treatment ventilation, accurate directions to residents, and thorough identification of hazards/sensitive sites. - There are new chemistries available and some behavioral avoidance issues identified re: baits. - Resistance-management - Calculating rates of application in a structural setting – cover this more specifically
Are there opportunities to reduce duplication of effort?	Definitely. Several states are looking for updated content before implementation.
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	Need to involve end-users, trainers, and employers in the process; engage with regulators/enforcement to address real-world exposure scenarios.
Category required for applicators as described in 40 CFR Part 171.103(g)	***Industrial, institutional, and structural pest control.*** This category applies to commercial applicators who use or supervise the use of restricted use pesticides in, on, or around the following: Food handling establishments, packing houses, and food-processing facilities; human dwellings; institutions, such as schools, hospitals and prisons; and industrial establishments, including manufacturing facilities, warehouses, grain elevators, and any other structures and adjacent areas, public or private, for the protection of stored, processed, or manufactured products.
Researched/summarized by CTAG member Kaci Buhl	

Summary (1-3 paragraphs): Industrial, Institutional & Structural (IIS)

There is no national manual nor any widely-adopted version(s). This category manual is likely to share significant content across the nation, where interior conditions and pests are similar. However, fire ants and termites represent major differences between the north and south.

- Principles, practices of IIS: all states/tribes/territories
- General pests in buildings, fabrics, food preparation areas: all states/tribes/territories
- Fire ants and termites: Certain southern states

In a recent AAPCO survey, 20% of certifying authorities said they need new or updated training materials for this category, and 43% said they might need updated materials to meet new competency requirements. It ranked 4th in category priorities. Within regions that share similar conditions and pests, states/tribes/territories may benefit from partnering. They should seek out neighboring states/tribes/territories with aligning category(ies).

All states/tribes/territories use this category because it is federally required. However, there's a great deal of variation in the approach to lumping/splitting this category. "Residential," "Structural," and "Institutional" are common terms for this category. This category is often split into smaller categories such as:

- General pest control with breakouts (several states) such as:
    - Termites
    - Indoor plant maintenance
    - Industrial weed control
    - Nuisance wildlife
    - Wood destroying organisms
    - Moss control

This category content is unique because certified applicators in this category have the most frequent and close interactions with the public, including people in schools, daycare centers, eldercare, and hospitals. This presents the greatest number of challenges and opportunities for *risk-reduction by communication*. Indoor settings can also pesticides to persist for much longer periods than outdoor settings. Routine pesticide applications on a schedule are outdated but the approach is still practiced.

For this category, we may need a suite of materials to be shared, including content related to principles/practices/pests (one body of work), content related to termites (one body of work) and content related to fire ants (one body of work). This would allow certifying authorities to mix and match, as needed.

Public Health Pest Control	
Federal category for commercial applicators	
Are any existing manuals/exams available?	AMCA has a national training manual. No national exam I am aware of.
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	Lots of different versions of manuals out there. Several are updating their manuals. Might be hard to have a national manual since each control program is so unique. Regional adoption might be possible. Not all treat public health the same, lots of lumping and splitting
How many states/tribes use this category?	all (though some lump)
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	National unlikely, even regional tough as public health means lots of different things to different states.

How is the category lumped with other categories and/or split into several categories?	sometimes alone, sometimes with aquatic, sometimes split out mosquito vs Industrial, Structural etc.
The new competencies are described in 40 CFR Part 171.103(d)(8)	***Public health pest control.*** Applicators must demonstrate practical knowledge of pests that are important vectors of disease, including recognizing the pests and signs of their presence, their habitats, their life cycles, biology and behavior as it may be relevant to problem identification and control. The required knowledge also includes how to minimize damage to and contamination of areas treated, acute and chronic exposure of people and pets, and non-target exposures.
Are there emerging regulations or science in this area?	resistance and new a.i.
Are there opportunities to reduce duplication of effort?	possibly, particularly for something as ubiquitous as mosquito
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	mosquito control could be cross checked with groups like AMCA. Other pests going to be much more difficult
Category required for applicators as described in 40 CFR Part 171.103(h)	***Public health pest control.*** This category applies to State, Tribal, Federal or other governmental employees and contractors who use or supervise the use of restricted use pesticides in government-sponsored public health programs for the management and control of pests having medical and public health importance.
Researched/summarized by CTAG member Brett Bultemeir	

Summary (1-3 paragraphs):
Lots of manuals exist, many are being updated currently. This category is less well defined among the states compared to others. Although all states engage in some level of mosquito control, “public health” is much more nebulous to define. It might be possible to develop a largely national mosquito manual, with regional variations, but a true national public health may not be worth the effort.

Working with a group like AMCA might help to create a more usable national mosquito management manual, which can be adapted for regions or states to fit their particular model. Many states are likely to still want to develop their own manuals given the unique laws, regulations, sites, and species in the states. It might be possible to get certain regions to work together, but this might be more easily done through the regional or strong state chapters of AMCA.

Regulatory Pest Control
Federal category for commercial applicators

Are any existing manuals/exams available?	Mich. State, January 2006 other outdated manuals
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	There are not choices for recently written manuals
How many states/tribes use this category?	about 30 states along with American Samoa, Three Affiliated Tribes, Puerto Rico, Virgin Islands and Northern Marianas
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	Federal regs and quarantine material should be similar by state, but the portion(s) that cover state laws etc.would need to be tailored to specific regions. Possibility for a federal manual that covers the bulk of content: elements of a regulatory program, applicable laws relating to federal quarantine, environmental impacts of RUPs, factors influencing introduction and spread of regulated pests, etc Each region and/or state would need it's own insert to address pests of concern in their area
How is the category lumped with other categories and/or split into several categories?	It may be lumped into forest pest and possibly outdoor ornamental to cover pests that have quarantines
The new competencies are described in 40 CFR Part 171.103(d)(9)	***Regulatory pest control.*** Applicators must demonstrate practical knowledge of regulated pests, applicable laws relating to quarantine and other regulation of regulated pests, and the potential impact on the environment of restricted use pesticides used in suppression and eradication programs. They must demonstrate knowledge of factors influencing introduction, spread, and population dynamics of regulated pests.
Are there emerging regulations or science in this area?	invasive pests and quarantines are always changing
Are there opportunities to reduce duplication of effort?	could possibly combine regionally for regulated pests and quarantines and the impact of RUPs on the environment. Attempts at a national manual would likely be unuseful
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	Complete knowledge federal quarantine programs and control strategies for those pests, coverage of using pesticides in a regulatory program
Category required for applicators as described in 40 CFR Part 171.103(i)	***Regulatory pest control.*** This category applies to State, Tribal, Federal, or other local governmental employees and contractors who use or supervise the use of restricted use pesticides in government-

	sponsored programs for the control of regulated pests. Certification in this category does not authorize the purchase, use, or supervision of use of products for predator control listed in paragraphs (k) and (l) of this section.
Researched/summarized by CTAG member Amanda Couture	

Summary (1-3 paragraphs):

Demonstration & Research	
Federal category for commercial applicators	
Are any existing manuals/exams available?	
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	
How many states/tribes use this category?	
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	
How is the category lumped with other categories and/or split into several categories?	
The new competencies are described in 40 CFR Part 171.103(d)(10)	***Demonstration and research.*** Applicators must demonstrate practical knowledge of the potential problems, pests, and population levels reasonably expected to occur in a demonstration situation and the effects of restricted use pesticides on target and non-target organisms. In addition, they must demonstrate competency in each pest control category applicable to their demonstrations.
Are there emerging regulations or science in this area?	
Are there opportunities to reduce duplication of effort?	
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	

Category required for applicators as described in 40 CFR Part 171.103(j)	***Demonstration and research.*** This category applies to individuals who demonstrate to the public the proper use and techniques of application of restricted use pesticides or supervise such demonstration and to persons conducting field research with restricted use pesticides, and in doing so, use or supervise the use of restricted use pesticides. This includes such individuals as extension specialists and county agents, commercial representatives demonstrating restricted use pesticide products, individuals demonstrating application or pest control methods used in public or private programs, and State, Federal, commercial, and other persons conducting field research on or involving restricted use pesticides.
Researched/summarized by CTAG member Neil Kittleson	

Summary (1-3 paragraphs):

Sodium Cyanide Predator Control	
Federal category for commercial applicators	
Are any existing manuals/exams available?	**MT Dept of Ag Contact Stephen M. Vantassel, svantassel@mt.gov** **New Mexico** **South Dakota (uses Wyoming's manual)** **Texas** https://www.texasagriculture.gov/RegulatoryPrograms/Pesticides/AgriculturalApplicators/PredatorManagementTrainingProgram.aspx **Wyoming Vertebrate Pest Manual** http://www.wyadmb.com/Education%20II.htm https://rules.wyo.gov/Search.aspx?mode=4 **USDA-Wildlife Services Manual**

	https://www.texasagriculture.gov/RegulatoryPrograms/Pesticides/AgriculturalApplicators/PredatorManagementTrainingProgram.aspx
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	Only a handful of states allow the use of M-44s. Some allow M-44s to be used only by USDA-Wildlife Services personnel. MT has Commercial, Govt, and Private NM has Govt and Private SD has Commercial, Govt, and Private TX has commercial, Govt, and Private WY has Commercial, Govt, and Private
How many states/tribes use this category?	MT, NM, SD, TX, WY
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	State differences would be minimal. Pests are limited to coyotes, feral dogs, and foxes.
How is the category lumped with other categories and/or split into several categories?	This is an isolated category.
The new competencies are described in 40 CFR Part 171.103(d)(11)	***Sodium cyanide predator control.*** Applicators must demonstrate practical knowledge of mammalian predator pests, including recognizing those pests and signs of their presence, their habitats, their life cycles, biology, and behavior as it may be relevant to pest identification and control. Applicators must demonstrate comprehension of all laws and regulations applicable to the use of mechanical ejection devices for sodium cyanide, including the restrictions on the use of sodium cyanide products ordered by the EPA Administrator. Applicators must also demonstrate practical knowledge and understanding of all of the specific use restrictions for sodium cyanide devices, including safe handling and proper placement of the capsules and device, proper use of the antidote kit,

	notification to medical personnel before use of the device, conditions of and restrictions on when and where devices can be used, requirements to consult U.S. Fish and Wildlife Service maps before use to avoid affecting endangered species, maximum density of devices, provisions for supervising and monitoring applicators, required information exchange in locations where more than one agency is authorized to place devices, and specific requirements for recordkeeping, monitoring, field posting, proper storage, and disposal of damaged or used sodium cyanide capsules.
Are there emerging regulations or science in this area?	The label has been revised three times in the past four years, which have the effect of reducing usability. It is questionable how much longer this tool will continue to be allowed.
Are there opportunities to reduce duplication of effort?	Absolutely.
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	M-44s are quite specialized and highly lethal to any organism that is exposed to the toxic powder. Given the scrutiny M-44s are under, I suspect that manuals and training are adequate to ensure compliance with label requirements.
Category required for applicators as described in 40 CFR Part 171.103(k)	***Sodium cyanide predator control.*** This pest control category applies to commercial applicators who use or supervise the use of sodium cyanide in a mechanical ejection device to control regulated predators.
Researched/summarized by CTAG member Stephen Vantassel	svantassel@mt.gov 406-538-3004

Summary (1-3 paragraphs):

M-44s are spring-loaded ejectors that dispense sodium cyanide for the purpose of managing coyotes, foxes, and wild dogs. The label has been revised twice since 2018 with increasing restrictions concerning its use. Restrictions have focused on reducing the potential for human and animal non-target exposure through expansion of exclusion zones and expansion of protections for T&E species.

There are two label versions. One version is only for use by USDA-Wildlife Services personnel (EPA# 56228-15). The other version includes state labels for use by private, commercial and state/county government personnel. The label has just been revised for 2022, so Montana will be updating its manual to reflect these additional changes.

Sodium Fluoroacetate Predator Control	
Federal category for commercial applicators	
Are any existing manuals/exams available?	**Texas** utilizes U.S.D.A. and related materials to train license candidates for their examinations. **Colorado -** No manual. We're going to make USDA submit their own Certification and Training Plan to test and issue their own license for these and M44s.
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	The AAPCO survey is inconsistent with the results I received from states (online and/or contacting state). This is most likely due to more than one person from each state responding to the survey. The survey showed the following: 7 - Yes, the manual needs updated 9 - Maybe, existing materials in review 2 - No, materials are sufficient I found some information online but proceeded to follow-up with the states listed below by contacting a SLA or PSEP. **Montana** - has the LPC category but does not register the product so no use is occurring. License types include Commercial, Government and Private **Mexico New** - Government (USDA/Aphis/WS only) **Texas** - Texas has the LPC category. We (Texas A&M AgriLife Extension) no longer distribute the category manual, as the Texas Department of Agriculture (TDA) Inspectors facilitate the certification and licensing activities.License types include private, commercial and noncommercial political subdivision **Idaho** - Currently, the Livestock Protection Collar (LPC) may be used in Idaho but only by licensed applicators that hold the Professional (Commercial) pesticide applicator category specific to the LPC. This category is only available to government officials employed to USDA-WS or persons contracted to them to provide that service. Use of the LPC by anyone other than authorized officials of USDA-WS or persons contracted by them to provide the service is not allowed by our state administrative rules. **Colorado -** USDA is the only agency that is allowed to use them and we don't have a manual and will not be creating this category in the future. We're going to make USDA submit their own

	Certification and Training Plan to test and issue their own license for these and M44s. **Virginia -** The use of Livestock Protection Collars is covered in the Predator Management Training Manual. This is an "add on" training as applicators must be certified in Vertebrate Pest Control or Demonstration and Research Pest Control prior to taking the Predator Management Training. Predator control measures may only be used by employees of the United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services. **Washington, Wyoming and South Dakota** do not allow use and/or recently repealed the use.
How many states/tribes use this category?	6
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	There would be none to minimal differences between States since pests are limited to coyotes that prey on sheep and goats. May be used only by trained, certified applicators
How is the category lumped with other categories and/or split into several categories?	This is a stand alone category. No lumping or splitting.
The new competencies are described in 40 CFR Part 171.103(d)(12)	***Sodium fluoroacetate predator control.*** Applicators must demonstrate practical knowledge of mammalian predator pests, including recognizing those pests and signs of their presence, their habitats, their life cycles, biology, and behavior as it may be relevant to pest identification and control. Applicators must demonstrate comprehension of all laws and regulations applicable to the use of sodium fluoroacetate products, including the restrictions on the use of sodium fluoroacetate products ordered by the EPA Administrator. Applicators must also demonstrate practical knowledge and understanding of the specific use restrictions for sodium fluoroacetate in the livestock protection collar, including where and when sodium fluoroacetate products can be used, safe handling and placement of collars, and practical treatment of sodium fluoroacetate poisoning in humans and domestic animals. Applicators must also demonstrate practical knowledge and understanding of specific requirements for field

	posting, monitoring, recordkeeping, proper storage of collars, disposal of punctured or leaking collars, disposal of contaminated animal remains, vegetation, soil, and clothing, and reporting of suspected and actual poisoning, mishap, or injury to threatened or endangered species, humans, domestic animals, or non-target wild animals.
Are there emerging regulations or science in this area?	Unknown, except the EPA has voiced concerns about the use of this product in the past. The Agency also has reviewed concerns about the exposure of threatened and endangered animal species with the United States Fish and Wildlife Service (USFWS). The March 1993 USFWS final biological opinion on the effects of sodium fluoroacetate on threatened and endangered species addressed the livestock protection collar and included jeopardy determinations to the gray wolf and grizzly bear.
Are there opportunities to reduce duplication of effort?	Yes.
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	Yes, as the EPA is monitoring and evaluating this product closely.
Category required for applicators as described in 40 CFR Part 171.103(l)	***Sodium fluoroacetate predator control.*** This pest control category applies to commercial applicators who use or supervise the use of sodium fluoroacetate in a protective collar to control regulated predators.
Researched/summarized by CTAG member Linda Johns	Linda Johns, PSEE Associate Director University of Minnesota Extension

Summary (1-3 paragraphs):

Wood Preservatives	
Not a Federal category	
Are any existing manuals/exams available?	Many manuals being used by states are quite old (80's, 90's). While these may meet competency standards as far as EPA is concerned, there have been updates to AI used in this industry that would be important to reflect in manuals and exams.

	Georgia Coop Ext publication from 1986 is used by some states, was basis of state specific manuals for others. Joint efforts between many states were made in 90's to build upon existing publications: Utah, Colorado, Oregon, California, New York, Pennsylvania, Wyoming, USDA Forest Service, and more. Most states seem to use this collaborative effort as a base for their state manual. Most current manuals found are Oregon (2015), Colorado (2021).
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	Only about 5 states identified Wood Preservatives on the AAPCO survey as a priority for revision. Some states even marked this as their lowest priority. This category has found itself to be low priority in revision due to low number of applicators requiring the category, but has also gone a very long time without revision in most of the states that don't consider it to be a priority. Many states used the same
How many states/tribes use this category?	Most states have this category.
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	While pests may vary slightly amongst regions, other areas such as equipment, products, safety, etc will be fairly consistent no matter the geographic location.
How is the category lumped with other categories and/or split into several categories?	Majority of states have Wood Preservatives as a standalone category that covers treatment of wood and wood products.
What are some sample competencies in this category? For example, what does the table of contents include?	Most states' competencies appear to be quite similar and follow the same structure, with some states expanding into more detail than others.

	States include this category under EPA's broader IIHS umbrella. Common competency standards include: · Knowledge of pests (life cycles, signs of their presence) · Characteristics of various wood preservative formulations · Equipment and methods of application · Potential hazards to human health, pets and domestic animals, and the environment · Measures to minimize adverse effects · Waste disposal/proper handling of spills · Label comprehension
Are there emerging regulations or science in this area?	Some areas not necessarily "emerging", but have occurred over the last couple years and wouldn't be reflected in the older manual versions: · Early 2000's- industry voluntary withdrawal of inorganic arsenical registrations for residential wood treatments · California no longer registers creosote or pentachlorophenol for wood treatments. The manual CA uses does cover these AI's, but prospective testers are made aware that they will not be tested on these areas. · Pentachlorophenol will be phased out over the next 5 years by EPA. Decision was released on Feb. 4, 2022. There may be a shift towards other/new AI's and at the least many manuals and exams will become outdated as all that were looked at did talk about pentachlorophenol. Reclassification of wood-destroying beetles. Anobiidae and Lyctidae no longer families.
Are there opportunities to reduce duplication of effort?	Wood Preservatives is a category that is a prime candidate for national or potentially regional efforts. Past manual collaborations have occurred across the country with input from each region. Many states don't have their own state specific manual and use a manual from another state. Because this type of application has similar pests, equipment, and products no matter the location, it would be wise for states to continue sharing material to reduce repeated efforts and allow more states to have update manuals.

Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	· When using another state's manual, it is important to regularly check to see if there have been updates. The state publishing the manual may not know who all is using their manual. Is there a way to facilitate communication so that states that publish their own manuals can reach out to those using it while still in the revision stage? Revisions may make other states' exam items invalid. · With upcoming changes in AI's, another revision may be required a few years down the road. With changes to registered products and classification of pests, different states may be adapting at different speeds.
Researched/summarized by CTAG member Lindsey House	

Summary (1-3 paragraphs):

Wood Preservatives is a category that most states offer to license applicators that treat wood and wood products. While very few states identified this category as a priority for revision in the AAPCO manual survey, it would be an excellent candidate for sharing of resources. A large number of states currently use manuals from the 1980's or 1990's, which may soon become outdated given recent updates to registered active ingredients and pest classifications. Two main areas to be aware of:

- 2/5/2022 EPA decision to phase out pentachlorophenol (PCP) over the next five years
- Re-classification for Anobiidae and Lyctidae beetle families, which have been abolished
  - Anobiid (deathwatch) beetles moved to family Ptinidae
  - Lyctid (true powderpost beetles) moved to new subfamily of Bostrichidae (false powderpost beetles)

The majority of states reviewed currently either share manuals with other states, or are using a state-specific manual that was slightly adjusted based off of a national collaborative effort made in the 90's. There are more recent manuals available, but given some impending changes it may be best for states that are interested in a newer manual to evaluate how their state will handle some of these coming updates before adopting a new manual and revising exams.

For states that direct their licensees to another state's manual for purchasing, a process for checking or communicating between the entities when changes are coming to the manual is

important. Some states have had exam questions become invalid because the manual had updated without their knowledge.

Disclaimer: the information on the manual of Microbial or Cooling Towers category may not give you the complete information as it is based on the data collected by AAPCO survey. Not every state/tribe who has this category participated in this survey.

Antimicrobial or Microbial Pest Control or Cooling Towers	
Not a Federal category	
Are any existing manuals/exams available?	There is no national standard manual on this category.
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	- Only 4 states participated in the AAPCO survey. Currently, 15 states have this nonfederal category. Based on the survey results and by contacting SLAs/PSEPs, we realized this category manual is not a priority for them at this point in time. - Some states have electronic version available to share with others. It seems that Vermont has revised their manual in 2020 and here is the online copy of it. New York is planning to revise this category manual and is interested in producing the National manual on Cooling towers.
How many states/tribes use this category?	It is a nonfederal category. Currently, 15 states use this category.
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	This category manual is not likely to vary significantly from region to region.
How is the category lumped with other categories and/or split into several categories?	It is a standalone category and is not lumped or splitted with any other category.
What are some sample competencies in this category? For example, what does the table of contents include?	***This is not a Federal category and there are not any Federal competencies for this category; hence, the competencies may vary from region to region.*** Here is a list of competencies and this is NOT a comprehensive list and may not include each and every state/tribe's competencies: Pest identification, Knowledge of microorganisms, Method of microorganisms control, Knowledge of antimicrobial pesticides including formulations, dosage, groups/types, etc., Knowledge of factors affecting use of antimicrobial pesticides; Knowledge

	of pesticide toxicity, Knowledge of proper storage, handling, & transport, proper cleaning, spills clean-up, & waste disposal, Knowledge of laws & regulations, Proper measurement & calibration calculations, Knowledge of label interpretation, Appropriate procedures for mixing, loading, & applying antimicrobial pesticides; Application methods, Information necessary for safe & adequate application of antimicrobial pesticides; Knowledge of worker safety, notice, posting, and REI, Potential for phytotoxicity, Hazards associated with pesticide use; Knowledge of building science, moisture, and mold pathways; Remediation of moisture damage; Mold remediation; Knowledge of cooling towers, cooling water organisms and problems; IPM, selection and application of pesticides for mold, Hazards associated specific to SO2 gas; Proper handling, storage, and security of SO2 cylinders, Assure the barrels and wooden tanks for hole/cracks prior to SO2 application, Knowledge of Emergency or Incident response plan, Knowledge of methods for disinfecting water lines, Pesticide and biocide fate
Are there emerging regulations or science in this area?	There is not much change in this category except the use of antimicrobials have increased significantly due to COVID-19.
Are there opportunities to reduce duplication of effort?	A couple of comments to reduce duplication- Within regions, form a joint working group or collaboration among interested PSEPs and SLAs who want to update the study materials. States should work together and are willing to share their manuals.
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	This category content is unique to each state, for example, some states have more focus on Cooling towers than viruses. Some states have manuals that are focused on mold remediation in HVAC and Cooling towers and may not cover content or knowledge check on viruses. To ensure the accuracy/quality, states/tribes get the study materials from a reliable source (PSEP, SLA, or organizations where PSEP/SLA/EPA work in collaboration) and get study materials in a modifiable version to change it to meet their needs.

Researched/summarized by CTAG member Gurinderbir Chahal	

Summary (1-3 paragraphs): Antimicrobial or Microbial or Cooling Towers

There is no national manual on this category, most of the states that have this category have developed their own study material. This category manual may vary from region to region because some states have content more focused on antimicrobials and others have it on mold remediation and/or control of microorganisms in water lines. In a recent AAPCO survey, revising this manual is not a priority for most of the states/tribes because there is not significant change in pesticide technology and regulations related to this category.

Not every state/tribe/territory uses this category because it is not federally required. There is not a great deal of variation in the approach to lumping/splitting this category. In most states, it is a standalone category. “Antimicrobial or Microbial or Cooling Towers” is the most common category name for this category.

In an effort to reduce duplication, SLA/PSEP leads should work collaboratively to revise the study materials. In states/tribes that have this category, pesticide applicators certified in this category will be exposed to some or all of this content. This category applies to commercial applicators who use or supervise the use of restricted use antimicrobial pesticides to control microorganisms.

Natural Areas – Pest Control	
Not a Federal category	
Are any existing manuals/exams available?	Florida has manual and exam JUST for natural area. Nature Conservancy has natural area control handbook, covers ALL types of control.
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	Very few states pull this out separately. Most have it as part of forestry. Many want information about invasive species control, but not necessarily pesticide applicator training specific.
How many states/tribes use this category?	3 (others have it in forest)
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	unlikely to have national, or even regional interest in a stand alone manual
How is the category lumped with other categories and/or split into several categories?	lumped typically with Forest

What are some sample competencies in this category? For example, what does the table of contents include?	***Licensing in Natural areas*** ***Pest Plants in Natural areas*** ***Herbicide Characteristics*** ***Methods of Application*** ***Mixing, Loading, and Application*** ***Non-herbicide Methods*** ***Understanding the Label*** ***Record Keeping Forms and Common Conversions***
Are there emerging regulations or science in this area?	New invasive species
Are there opportunities to reduce duplication of effort?	probably not
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	This will widely vary with each region/state
Researched/summarized by CTAG member Brett Bultemeier	

Summary (1-3 paragraphs):

This is NOT a common category and as such the need for a national or even regional manual is minimal. It would be possible that states with this program might simply share certain chapters to be utilized in others much larger manuals. Florida will have a Florida specific manual that might be of use to the southern region, but many of the species discussed would not transfer to states further north. This is a category that likely does not need further discussion. Those groups doing large scale natural area management are well connected for the information they need, and so few need a proper license that efforts should be focused on other areas.

Marine Antifouling	
Not a Federal category	
Are any existing manuals/exams available?	-Wisconsin AntifoulingPaints- 2020 -Alaska Anti-fouling Paints- 2022 -New Jersey Certification for Safe Handling & Use of Antifouling Paints Containing Tributylin (TBT)
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	-contacted writers of Wisconsin edition of Antifouling paints- Steve Tomasko and Glenn Nice

How many states/tribes use this category?	About 20 states and territories -Alaska -Alabama- (TBT) -California- (TBT) -Connecticut- (TBT) -Rhode Island- (TBT) -Maryland- (TBT) -Florida -New Jersey -Mississippi -Oregon -South Carolina -Tennessee -Delaware -Washington -New york -Ohio -Wisconsin -Virginia
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	competencies needed for this category have a broad reach and would be similar to coastal states The principal function of antifouling paint is to interrupt the life cycle of marine organisms on ships/hulls and they release a biocide over a period of time.
How is the category lumped with other categories and/or split into several categories?	some of wood destroying organisms, control of aquatic microorganisms, and wood preservation may somewhat overlap but this category is geared towards marine applications
What are some sample competencies in this category? For example, what does the table of contents include?	1. Wood species and wood structure. 2. Wood destroying pests and their biology. 3. Wood preservatives that may be used to prevent or control damage caused by wood destroying pests. 4. Antifouling paints and how they work 5. Factors that may affect the need for, and appropriate use of, marine antifouling paints. 6. Potential health and environmental hazards related to the use of wood preservatives.

	7. Appropriate procedures for mixing, loading, applying, and disposing of wood preservatives, to prevent or minimize related hazards.
Are there emerging regulations or science in this area?	not much emerging science, but changes in actives. -last big change was the cancellation of paints with tributyltin (TBT) -the EPA proposed canceling irgarol in 2020. Interim decision: Antifoulant paint uses must be removed from labels by submitting a label amendment to the agency by September 30, 2023. Products that are only registered for antifoulant paints uses must request voluntary cancellation by September 30, 2023. ?? (double-check) -some places have put restrictions on the use of copper
Are there opportunities to reduce duplication of effort?	yes- competencies for this category are very similar in the regions that have this category
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	
Researched/summarized by CTAG member Amanda Couture	

Summary (1-3 paragraphs):

Disclaimer: the information on the manual of Sewer Root Control category may not give you the complete information as it is based on the data collected by AAPCO survey. Not every state/tribe who has this category participated in this survey.

Sewer Root Control or Metam Sodium	
Not a Federal category	
Are any existing manuals/exams available?	There is no national standard manual on this category; however, some states have adopted the manual created by Cornell University, NY.
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	Summary findings: - AAPCO survey: 8 states want to update their manual (aka study materials); Updating the study materials is not a priority for most of the states - It is a standalone category in most states - Most of the study materials were created in the 90s. - Some states have electronic versions available to share with others. - Wisconsin revised their manual in 2022 and a copy of the revised version will be shared on request. There is not much new w.r.t pesticide technology or regulations. The main pesticide used in sewer root control is Metam sodium. Changes will involve- layout changes, revising language to make things easier to understand and adding some new graphics. - The University of Wyoming is revising this manual and is expected to release it by the end of this year. Some states are waiting on the release of revised version so that they can adopt it. The changes involve- increased content and images. This manual should be available for each state to use. Current status is that content is being vetted, images are being collected, and exam questions are being finalized.
How many states/tribes use this category?	It is a nonfederal category. Currently, 32 states use this category. There is not much variation in this category.
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be	This category manual is not likely to vary widely from region to region because the main pesticide used in Sewer Root Control is Metam Sodium which is used for the control of roots in sewers.

similar in each state, or tailored to local pests/conditions?	
How is the category lumped with other categories and/or split into several categories?	Sewer Root Control or Metam Sodium" is a standalone category in most states. In a few instances, this category is lumped with Aquatic by Ohio, Nebraska, and Utah and some states are thinking of using the new Fumigation manual because it has a full chapter on Sewer Root Control Line; therefore, it may be lumped under the federal Fumigation category.
What are some sample competencies in this category? For example, what does the table of contents include?	**This is not a Federal category and there are not any Federal competencies for Sewer Root Control; hence, the competencies may vary from region to region.** Here is a list of competencies and this is NOT a comprehensive list and may not include each and every state/tribe's competencies: Knowledge of health & environmental hazards of Metam-sodium in sewer lines, septic tanks, & wastewater treatment facilities. ID, use & maintenance of PPE, Knowledge of proper storage, handling, & transport, Proper cleaning, spills clean-up, & waste disposal, Knowledge of label interpretation, Knowledge of laws & regulations, Proper measurement & calibration calculations as applied to sewer root control, Knowledge of effects Metam-sodium in downstream water bodies (streams, rivers, ponds, groundwater) & lateral/upstream residential, Effects on non-residential sewer connections, Factors that determine need for a sewer fumigation, Appropriate procedures for mixing, loading, & applying sewer fumigants, Fumigation equipment, Knowledge of worker safety, notice, posting, and REI, Factors around sewer lines that influence root growth, Pesticides available for sewer root control, Application methods, Information necessary for safe & adequate application of pesticides, Effects of root control on groundwater, sewage treatment plants, septic tanks, & holding tanks, IPM, Persistence beyond intended period of pest control, Potential for phytotoxicity, Techniques to minimize non target exposures, runoff, drift, & excessive foliage impact
Are there emerging regulations or science in this area?	In the last couple of decades, there is not much change in this category w.r.t emerging pesticide science or regulations.

Are there opportunities to reduce duplication of effort?	A couple of comments to reduce duplication- within regions, form a joint working group or collaboration among interested PSEPs and SLAs who want to update the study materials. States should work together and willing to share their manuals
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	This category's content is unique because Metam Sodium is the main pesticide used in this category. The majority of pesticide applicators certified in this category will be exposed to some or all of this content. To ensure the accuracy/quality, states/tribes get the study materials from a reliable source (PSEP, SLA, or organizations where PSEP/SLA/EPA work in collaboration). We do not envision any tripping hazard in adopting the revised manual. For example, several states are planning to adopt the revised version that the University of Wyoming is releasing soon.
Researched/summarized by CTAG member Gurinderbir Chahal	

Summary (1-3 paragraphs): Sewer Root Control or Metam Sodium

There is no national manual on this category, but some states have adopted study material created by Cornell University. This category manual is not likely to vary widely from region to region because Metam Sodium is the only Restricted Use Pesticide used in this category. Most of the training materials were created in the mid 90s. In a recent AAPCO survey, revising this manual is not a priority for most of the states/tribes because there is not much change in pesticide technology and regulations related to this category.

Not every state/tribe/territory uses this category because it is not federally required. There is not a great deal of variation in the approach to lumping/splitting this category. In most states, it is a standalone category. "Sewer Root Control or Metam Sodium" is the most common category name for this category. In a few states, this category is lumped with the Aquatic category or Fumigation category.

In an effort to reduce duplication, SLA/PSEP leads should work collaboratively to revise the study materials. In states/tribes that have this category, pesticide applicators certified in this category will be exposed to some or all of this content. This category applies to commercial applicators who use or supervise the use of restricted use pesticides to control roots in sewers.

Interior Plantscapes
Not a Federal category

Are any existing manuals/exams available?	Quite a few manuals available. While some have older revision dates, the material appears to still be relevant.
Research notes: - Anything identified in the AAPCO survey? - What did you find online? - What did you learn contacting others?	1 state listed Interior Plantscape as revision priority 11 out of 23. No other states mentioned this category. This state's Interior Plantscape manual was much more extensive than others available, may not be able to get what they need from existing options.
How many states/tribes use this category?	Around 20% of states have a designated Interior Plantscapes category.
How national, regional, or local is the training material likely to be, for this category? For example, would you expect the training material to be similar in each state, or tailored to local pests/conditions?	Material for Interior Plantscape manuals and exams is fairly standard across the US when it comes to pests, diseases, registered products, equipment, and safety concerns. Potential for slight variation in pests based on region.
How is the category lumped with other categories and/or split into several categories?	Interior Plantscapes is a subcategory of Ornamental and Turf for most states. A handful of states lump with Greenhouse.
What are some sample competencies in this category? For example, what does the table of contents include?	Common competencies include: ● Identification of disease, insect, and mite pests ● Environmental conditions that impact pest problems ● Applicator safety ● Pesticide formulations, compatibility, resistance ● Calibration

Are there emerging regulations or science in this area?	No emerging issues found in this area.
Are there opportunities to reduce duplication of effort?	It does not appear that any states currently are working on this manual/exam or have this as an upcoming priority. Sharing of existing manuals should be a sufficient way for most states with particularly old manuals to make an updates desired. The one state that did list Interior Plantscape as a “middle of the road” priority has the most detailed and in-depth manual found, so other existing manuals may not be helpful for them.
Are there critical items or methods needed to ensure accuracy/quality? Are there tripping hazards on the path to adopting the new/revised manual?	While the material for Interior Plantscape should lend itself well to national efforts, particularly sharing of existing materials, the main block that could arise is the difference in state’s level of expected knowledge for applicators.
Researched/summarized by CTAG member Lindsey House	

Summary (1-3 paragraphs):

Interior Plantscape is a category that around 20% of states use to license applicators who apply pesticides to interior plantings in locations such as shopping malls, hospitals, and other corporate and public buildings. This category is not a federal category, and is comprised mostly of general use pesticide applications. States that require this category are mainly those states that require licensing for commercial applications of all pesticides, not just restricted use.

There does not appear to be much need for updates to this category amongst states. Only one state mentioned this category in their priority ranking, and even then it was only a mid-level priority. While most states with this category did not list it as a priority, it would be a straightforward category for sharing of existing materials due to similar pests, equipment, safety concerns, and other competency standard areas. Many states have manuals that are publicly available. The biggest hurdle found was the difference in the amount of detail that states want to cover. Some states’ manuals are around 10 pages of basic info, and other states are 75+ pages that list tables of specific pest species, products, etc. States may find it difficult to either beef up or pare down manuals that are so drastically different in detail and length than what they are wanting.