Tying the Manual to the Test
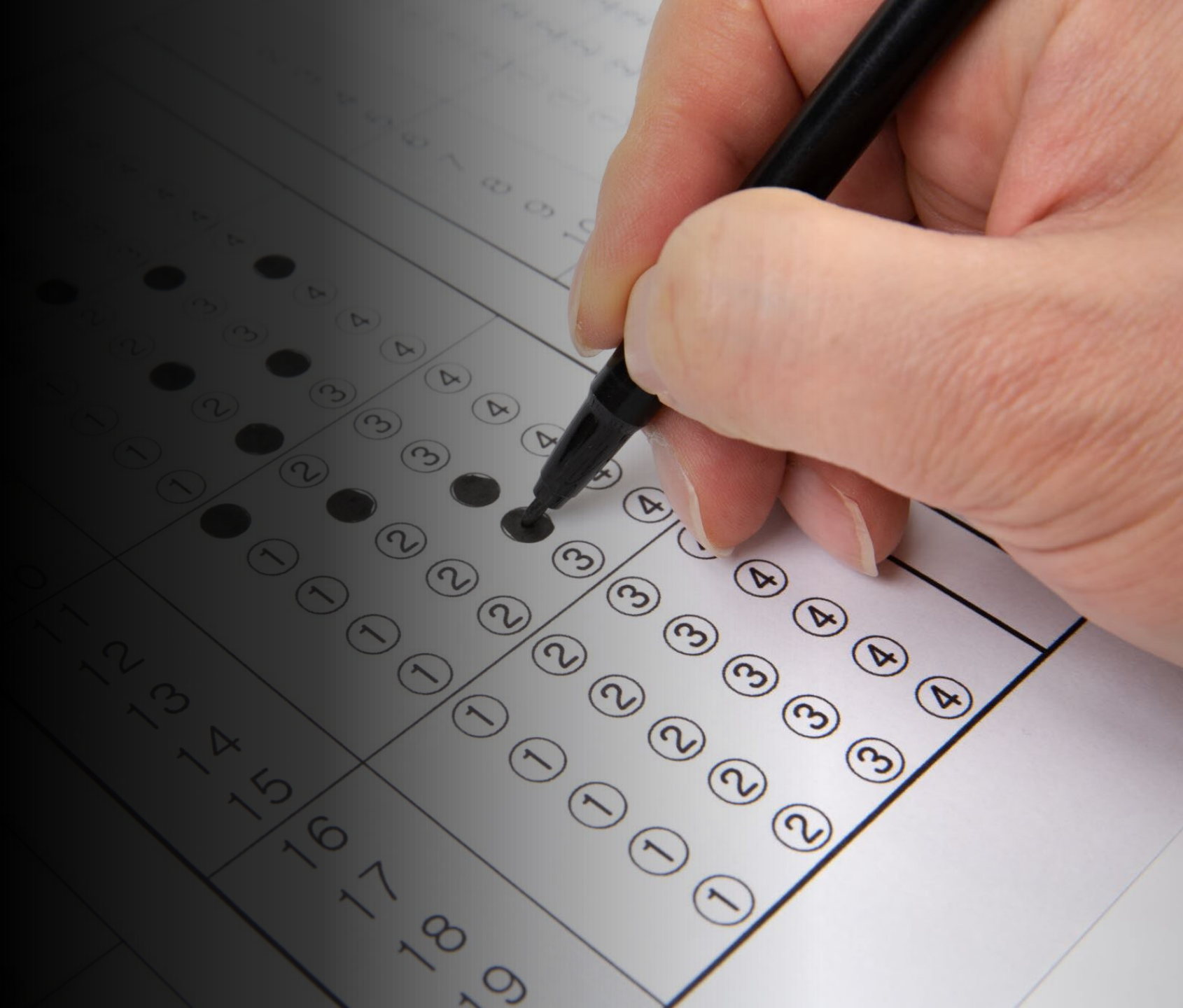
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Three Methods

- Common
- Purdue
- Cornell

Common Method

- SLA designee opens manual and looks for content on which to base test items

Common Method

- Manual may or may not have learning objectives (LOs)

Chapter 14. Wood-Boring Beetles

Learning Objectives	• Describe the life cycle of and damage caused by powderpost beetles and old house borers. • Distinguish between the types of wood which different powderpost beetles will attack. • Determine whether a powderpost beetle infestation is active. • Describe the options for controlling powderpost beetle and old house borer infestations.
	Worldwide there are thousands of different beetles that bore into wood. The good news is that fewer than 100 species are pests. These wood borers damage preseasoned or seasoned wood that is used in structures or furnishings. Many times the damage is invisible for one to 15 years, because the insect is slowly growing and eventually cuts a surface hole to get out. The exit holes look like shot holes, which is characteristic of this damage. You can't see the larvae in the wood, so detection and identification is based on the presence of sawdust, the size and shape of emergence holes, and the age and type of wood involved.
Powderpost Beetles	The larvae of these families of beetles bore tunnels in wood, reducing the lumber to masses of very fine powder. When the insects exit the infested boards, they leave little holes that are called "shot holes." Most of the damage is done by the larvae.

Chapter 11. Weeds of Ornamentals and Turf

A weed is commonly defined as any plant that is growing out of place or where it is otherwise not wanted. Bluegrass growing in a bentgrass green would be considered a weed. Bentgrass in a bluegrass lawn would be a highly objectionable weed. Yet each grass is excellent in its own place and for its own purpose. With few exceptions, certain broadleaf plants like chickweed and plantain are almost always considered to be weeds. Most weeds possess a vigorous capacity for growth and reproduction often under adverse conditions.

Why get rid of weeds? Obviously, aesthetic reasons related to turf appearance, and safety or speed encountered on athletic fields or golf courses are important factors to consider. Weeds also compete with desirable plants for water, fertilizer, light, carbon dioxide, and other essentials for growth. The greater the growth of weeds, the more competitive they become with desirable plants. Many common perennial weed species form deep, extensive root systems

presence of bare soil or thin turf offers ample opportunity for weed infestation.

Weed management is an essential part of any effective cultural program, and removing established weeds can be expensive. Weed management may take many forms, cultivation, hand removal, preemerence or post emergence herbicide applications, crop rotation, etc.

Ways in Which Weeds Injure Plants or Affect Land Use

- Reduce yields—competition for moisture, light, nutrients.
- Reduce turf and ornamental quality—weed seeds in grass seed or other seed grown for harvest.
- Increase production costs—additional tillage, cultivation of nursery crops; cost of herbicides; prolong pre-commercial period in plantations where weeds become competititve.
- Increase labor and equipment costs—machinery wear and tear, etc.

Common Method: Pros

- Maximum flexibility for SLA in determining content
- Can base items on LOs, if present

Common Method: Cons

- SLA designee takes on task of identifying content alone
- Likely to result in overrepresentation of some content areas and underrepresentation of others
- Content less likely to be linked to job (especially if learning objectives are lacking)
- Test susceptible to test- or item-level challenge

Common Method: Mitigating the Cons

- Solicit subject matter expert (SME) input
  - Content weighting (e.g., % of test that should cover each chapter)
  - Content selection (e.g., which specific topics should be covered on test)
  - Item review (with nondisclosure agreement)
- If LOs not in manual, write own prior to writing test item
  - Helps clarify item content and focus writing

Purdue Method

- Manual contains LOs that address required job knowledge and skills
- SMEs determine % of test items that address each group of job tasks
  - Reflects relative task importance with respect to public and environmental protection allocated to each group of tasks
  - Example: 12% of test items should address tasks involved in planning pest management activities
- SLA designee writes items that address learning objectives

Purdue Method: Pros

- Logically defensible process
- Content weighting relies on informed group judgment
  - Determined by SMEs
    - SLA responsible for choice of LOs on which to base test items and retains right to include overlooked LOs
  - Balanced across job tasks
    - Whether writer splits or lumps chapters
- Items tied to job-based learning objectives
- Provides a persuasive rebuttal against an exam- or item-level challenge

Purdue Method: Cons

- Susceptible to selection bias
  - SLA alone selects LOs on which to base test
- Content for any group of tasks could be spread across several chapters in manual
  - Might be more difficult to find the chapter in which a selected LO is in the manual

Purdue Method: Mitigating the Cons

- SMEs review test (with nondisclosure agreement)
- Conduct pre-test with sample audience
- When grouping tasks, indicate in which chapter each LO will appear

Cornell Method

- Manual contains LOs that address required job knowledge and skills
- Test based on most important learning objectives (LOs) as selected by subject matter experts (SMEs)
  - Each SME selects independently
- Equal proportion selected from each chapter
  - Ensures all content areas are weighted equally on exam

Cornell Method

Step 1: Determine % of LOs to select in manual (will explain how later)

Cornell Method

Step 1: Determine % of LOs to select in manual

Step 2: Determine # of LOs to select in each chapter (may need rounding)

- Target is 50% and chapter has 13 LOs
  - Tell SMEs to select 7; do not leave rounding to them or vote totals might differ

Cornell Method

Step 1: Determine % of LOs to select in manual

Step 2: Determine # of LOs to select in each chapter

Step 3: Each SME selects LOs they deem most important (no ranking; each LO selected simply gets 1 vote)

Cornell Method

Step 1: Determine % of LOs to select in manual

Step 2: Determine # of LOs to select in each chapter

Step 3: Each SME selects LOs they deem most important

Step 4: Tally the selections and share with SLA

Cornell Method: Wood Preservation Example

Ask SMEs to select top 50% of LOs

Chapter 1: Wood and Its Preservation

Learning Objectives

Please select 7

1. Explain why we need to protect wood products from pests.
2. List conditions that make wood more susceptible to pests.
3. Define wood preservation.
4. Define wood preservative.
5. Distinguish between oilborne and waterborne wood preservatives.
6. Distinguish between wood preservatives and treated wood with respect to their regulation under federal and state pesticide laws and regulations.
7. Explain the importance of making effective wood preservation treatments.
8. Give reasons why wood varies in how easy or hard it is to treat.
9. Distinguish sapwood from heartwood, including their effect on treatment by wood preservatives.
10. Describe how wood cells influence the acceptance of preservatives by wood, including differences between softwoods and hardwoods.
11. Explain how air and water in wood cells affect the uptake of preservatives.
12. Give reasons why specifications for wood treatments can vary.
13. Describe the role of each of the following in providing you with the specifications for treating wood:
    — American Wood Protection Association and its *Book of Standards*
    — International Code Council–Evaluation Service (ICC–ES) and its Evaluation Service Reports
    — Your customer
    — The preservative label
14. Explain what "labeling by reference" means and why it is important to the wood treater.

Cornell Method: Wood Preservation Example

30-70% of chapters: clear winners only

Chapter 1: Wood and Its Preservation

Learning Objectives

Please select 7

1. Explain why we need to protect wood products from pests. ④
2. List conditions that make wood more susceptible to pests. ④
3. Define wood preservation.
4. Define wood preservative. ③
5. Distinguish between oilborne and waterborne wood preservatives.
6. Distinguish between wood preservatives and treated wood with respect to their regulation under federal and state pesticide laws and regulations.
7. Explain the importance of making effective wood preservation treatments.
8. Give reasons why wood varies in how easy or hard it is to treat. ④
9. Distinguish sapwood from heartwood, including their effect on treatment by wood preservatives. ④
10. Describe how wood cells influence the acceptance of preservatives by wood, including differences between softwoods and hardwoods.
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    — American Wood Protection Association and its *Book of Standards*
    — International Code Council–Evaluation Service (ICC–ES) and its Evaluation Service Reports
    — Your customer
    — The preservative label
14. Explain what "labeling by reference" means and why it is important to the wood treater.

Cornell Method: Wood Preservation Example

Other times…

Chapter 3: Wood Preservatives

Learning Objectives

Please select 5

1. Tell how the AWPA Standards are pertinent to the makeup of preservatives and what wood products are treated with them.
2. Describe how oilborne and waterborne preservatives differ in their effects on treated wood.
3. For each preservative covered in this chapter:
   a. Tell whether it is oilborne or waterborne.
   b. Briefly discuss its physical features (e.g., liquid vs solid, suspension vs solution) and (if applicable) the roles of its components.
   c. Tell whether it is applied by pressure, thermal treatment, and/or nonpressure processes.
   d. If applicable, tell why it helps to heat it during application.
   e. Describe its effects on treated wood.
   f. Indicate the types of pests it controls and/or where treated wood can be used (e.g., above ground, in contact with ground or water).
   g. Give examples of end uses of treated wood products.
   h. List any important health and environmental concerns associated with wood preservative products and mixes.

Cornell Method: Wood Preservation Example

…it's not as precise, but that's ok

Chapter 3: Wood Preservatives

Learning Objectives

Please select 5

1. Tell how the AWPA Standards are pertinent to the makeup of preservatives and what wood products are treated with them. ③
2. Describe how oilborne and waterborne preservatives differ in their effects on treated wood. ③
3. For each preservative covered in this chapter:
   a. Tell whether it is oilborne or waterborne.
   b. Briefly discuss its physical features (e.g., liquid vs solid, suspension vs solution) and (if applicable) the roles of its components. ④
   c. Tell whether it is applied by pressure, thermal treatment, and/or nonpressure processes.
   d. If applicable, tell why it helps to heat it during application.
   e. Describe its effects on treated wood.
   f. Indicate the types of pests it controls and/or where treated wood can be used (e.g., above ground, in contact with ground or water). ③
   g. Give examples of end uses of treated wood products. ③
   h. List any important health and environmental concerns associated with wood preservative products and mixes. ⑤

- Red = Clear Winners, Green = Ties

Cornell Method: SLA Role

- Usually is one of the SMEs
- Base test items on clear winners
  - Choose from ties if too few clear winners

Cornell Method: Pros

- Logically defensible process
- Easy to weight test across content
- Content relies on informed judgment
  - Determined by SMEs
    - SLA has choice of "ties," option to include more than 1 test item for an LO, and right to include overlooked LOs
  - Balanced across chapters
    - Whether writer splits or lumps chapters
  - Tied to job-based learning objectives
- Provides a persuasive rebuttal against an exam- or item-level challenge

Cornell Method: Cons

- Less flexible for SLA designee than Common and Purdue methods
- Test content weighting susceptible to manual writer's bias; e.g., long insect chapter vs short plant disease chapter

Cornell Method: Mitigating the Cons

- SMEs review test (with nondisclosure agreement)*

- Conduct pre-test with sample audience*

- Writer's content weighting bias lessened if manual is based on required job knowledge and skills

*NY SLA has yet to adopt these practices

Cornell Method

Step 1: Determine % of LOs to select in manual: Will explain now

Cornell Method : Step 1 Explained

Step 1: Determine % of LOs to select in manual: Will explain now

Based on data from 12 manuals

Cornell Method: Step 1 Explained

Total # of LOs to Select = Test Items / 0.8
(which is the same as Test Items x 1.25)

Cornell Method: Step 1 Explained

Total # of LOs to Select = Test Items / 0.8
(which is the same as Test Items x 1.25)

% to Select = $\dfrac{\text{Total LOs to Select}}{\text{Total LOs in Manual}}$ x 100

Cornell Method: Step 1 Example

Example: Wood Preservation Manual

Test will have 50 items

- LOs to select = 50 x 1.25 = 63 (rounded)

Cornell Method: Step 1 Example

Example: Wood Preservation Manual

Test will have 50 items

- LOs to select = 50 x 1.25 = 63 (rounded)

Manual has 118 total LOs

- % to Select = $\dfrac{63}{118}$ x 100 = 53.39%

Cornell Method: Step 1 Example

Example: Wood Preservation Manual

Test will have 50 items

- LOs to select = 50 x 1.25 = 63 (rounded)

Manual has 118 total LOs

- % to Select = $\frac{63}{118}$ x 100 = ~~53.39%~~ 50%

Cornell Method: Step 1 Example

Example: Wood Preservation Manual

Test will have 50 items
- LOs to select = 50 x 1.25 = 63 (rounded)

Manual has 118 total LOs
- % to Select = $\dfrac{63}{118}$ x 100 = ~~53.39%~~ 50%

Clear Winners: 53