Exam & Procedures Updates

North America CCA Board
Boise, ID  September 2012
GOALS OF OUR CCA PROGRAMS:

• Increase the proficiency of those who work with crops and soils
• Distinguish and reward those who have achieved a minimum level of proficiency
GOALS OF OUR CCA PROGRAMS:

- Increase the proficiency of those who work with crops and soils
- Distinguish and reward those who have achieved a minimum level of proficiency

HOW WE ACCOMPLISH THESE GOALS

- Define and communicate expectations
- Provide educational offerings
- Assess knowledge and skills
GOALS OF OUR CCA PROGRAMS:

- Increase the proficiency of those who work with crops and soils
- Distinguish and reward those who have achieved a minimum level of proficiency

HOW WE ACCOMPLISH THESE GOALS

- Define and communicate expectations
  
  Performance Objectives

- Provide educational offerings
  
  Various Methods

- Assess knowledge and skills
  
  Exams
Hallmarks of Good Education Programs

- Stay up to date with changes
- Reviewed by stakeholders
- Tests reflect expectations
- Reasonable minimum level of achievement is determined
Keeping Up To Date

• Performance objectives reviewed every four years
  – Subject matter experts and practitioners
  – Remove obsolete materials, keep up to date with new technologies, etc.
  – One module can be done annually, two every two years, etc.

• Exam updated annually
  – Change at least 25% of items every year
  – Poor performing items are removed
  – Keeps exam up to date with changes in objectives
  – Change helps keep up with those who might try to memorize items
Reviewed by Stakeholders

• Performance objectives are reviewed by subject matter experts and practitioners
• End user review
• Exams are vetted by exam committees

EXAMPLE END USER SURVEY FORM FOR PERFORMANCE OBJECTIVE EVALUATION

Competency Area 1. BASIC CONCEPTS OF PLANT NUTRITION

How important is it for a Certified Crop Adviser to be able to:

1. List the 18 elements essential for plant nutrition

<table>
<thead>
<tr>
<th>Of no use</th>
<th>Nice to know</th>
<th>Should know</th>
<th>Need to know</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

2. Classify the essential elements as macronutrient or micronutrient

<table>
<thead>
<tr>
<th>Of no use</th>
<th>Nice to know</th>
<th>Should know</th>
<th>Need to know</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

3. Describe the functions of nitrogen in a plant

<table>
<thead>
<tr>
<th>Of no use</th>
<th>Nice to know</th>
<th>Should know</th>
<th>Need to know</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Please add any additional objectives that you think should be included under the Nutrient Management area.

____________________________________________________________________________________________________________________
Tests Reflect Expectations

- Every Test Item Matches a Performance Objective
- Number of Exam Questions reflects Emphasis Determined by Stakeholders

EXAMPLE SURVEY TO DETERMINE THE RELATIVE IMPORTANCE OF COMPETENCY AREAS

Recommendation for Test Content

Listed below are the six competency areas of nutrient management that may be covered in a test for crop advisers. What percent of the questions should be in each area? If you think an area should not be included in the test, put 0 in the space provided. Make sure your responses sum to 100.

PERCENT OF TEST QUESTIONS
1. Basic concepts of plant nutrition
2. Basic concepts of soil fertility
3. Soil testing and plant analysis
4. Nutrient sources and applications
5. Soil pH and soil amendments
6. Nutrient management planning

100%
Reasonable Minimum Level of Achievement is Determined

- Exam Standard Setting Session

**DETERMINING THE MINIMUM LEVEL OF ACHIEVEMENT**

To establish the minimum passing score for this exam, evaluate each question based on the following criterion:

What percent of minimally qualified examinees will be able to answer this question correctly? Please write your response, in percent, for each of the questions on the exam. This information will be summed to help determine the minimum passing.

1. ____%
2. ____%
3. ____%
Exam Resources

• Webinars
• Series of three articles
• Exam Resources Page
  https://www.certifiedcropadviser.org/exams/exam-development
Standard Operating Procedures for Local Programs
## Benchmark Dates for P.O. Document

<table>
<thead>
<tr>
<th>P.O. Benchmark Date</th>
<th>P.O. Document Activity</th>
<th>Date Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>State/Provincial/Regional P.O. revision committees meet to review appropriate module(s) and provide suggestions for updating to State/Provincial/Regional person (facilitator) responsible for creating the revised document.</td>
<td></td>
</tr>
<tr>
<td>1 February</td>
<td>Facilitator has draft of revised module(s) prepared and distributes to P.O. revision committee for comments/approval. Committee to return comments in 2 weeks.</td>
<td></td>
</tr>
<tr>
<td>1 March</td>
<td>Draft document distributed for review by practicing CCAs. CCAs will have 2 weeks to submit comments.</td>
<td></td>
</tr>
<tr>
<td>15 April</td>
<td>Facilitator reviews comments and summarizes suggestions received from CCAs. Facilitator distributes revised Draft document to P.O. revision committee.</td>
<td></td>
</tr>
<tr>
<td>15 May</td>
<td>P.O. revision committee reviews revised Draft document by conference call. Revision Committee makes recommendations for incorporating any changes into revised Draft document.</td>
<td></td>
</tr>
<tr>
<td>1 June</td>
<td>Facilitator incorporates suggested changes into revised Draft document.</td>
<td></td>
</tr>
<tr>
<td>August</td>
<td>Revised Draft document approved by State/Provincial/Regional E &amp; P committee. Approval can be done by conference call. Facilitator sends final document to printer</td>
<td></td>
</tr>
<tr>
<td>July</td>
<td>Final revised P.O. document ready for distribution after August exam.</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td>Follow Standard Operating Procedures Timeline as outlined in Section 2</td>
<td></td>
</tr>
<tr>
<td>Performance Objectives Reviews</td>
<td>Exam Revisions</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------</td>
<td></td>
</tr>
<tr>
<td><strong>September to March</strong></td>
<td><strong>June to November</strong></td>
<td></td>
</tr>
<tr>
<td>PO review committee members selected by CCA facilitator, meeting date set</td>
<td>Facilitator edits new questions from PO review committee members and incorporates these into the item bank</td>
<td></td>
</tr>
<tr>
<td>PO review committee meets to remove outdated content and incorporate new material (suggest no later than December)</td>
<td>Facilitator revises/replaces at least 25% of exam items based on item performance data, PO review, etc. (begin revisions no later than August)</td>
<td></td>
</tr>
<tr>
<td>Facilitator sends revised PO module document to committee for review</td>
<td>Facilitator provides revised exam to exam committee for their review prior to meeting</td>
<td></td>
</tr>
<tr>
<td>Facilitator incorporates committee suggestions</td>
<td>Exam committee meets (suggest no later than October)</td>
<td></td>
</tr>
<tr>
<td>Revised PO module sent in survey form (paper or electronic) to sample of CCAs for end-user review (suggest no later than February)</td>
<td>Facilitator incorporates exam committee suggestions into exam</td>
<td></td>
</tr>
<tr>
<td>Facilitator reviews survey and proposes edits in PO module to review committee, can be via teleconference</td>
<td>Every four years only, for standard setting: Exam committee ranks difficulty of each exam item (Angoff). Some year as exam item distribution survey</td>
<td></td>
</tr>
<tr>
<td>Revised PO module sent to exam committee for review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approval can be via teleconference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PO review committee members write new exam items for the POs assigned by the facilitator</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Every four years only, for exam item distribution: Entire PO document (all four modules) sent in survey form to sample of CCAs who rate the importance of the modules and competency areas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>August</td>
<td>Completed, revised exam is sent to ASA to be ready for February administration</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Complete, revised exam is sent to ASA to be ready for February administration.*

February

Exam Administration

Facilitator, Exam Committee review February exam stats

March to May

Facilitator makes any additional exam edits for August exam (if program has an August exam)

June

Exam is sent to ASA to be ready for August administration

August

Exam Administration

Facilitator, Exam Committee review August exam stats

*Note: Complete, revised exam is sent to ASA to be ready for August administration.*
The following information will accompany a letter to be sent to local program facilitators that will initiate their review process:

1. Please indicate the **most recent year** for each of the following for your program:
   - ___________ Nutrient Management PO review and end-user survey
   - ___________ Soil & Water Management PO review and end-user survey
   - ___________ Pest Management PO review and end-user survey
   - ___________ Crop Management PO review and end-user survey
   - ___________ Edits to any of the exam items
   - ___________ Exam distribution survey (entire PO document sent to sample of CCAs)
   - ___________ Exam standard setting session (each exam item rated for its difficulty)

2. Please enclose a chart/list that matches exam item numbers to each of your performance objectives.

3. Please enclose a chart/list showing exam item distribution (number or percentage of test items from each module and each competency area within each module).

ASA will return suggestions to help you improve your performance objectives and exams.
Standard Operating Procedures for Local Programs
2013 Exam

• 150 items—shrunk back in proportion from 188
• No constructed response—these were eliminated for the 2012 exam
• 38 items changed, 25%; We have been well over 25% in the last two years
• Focus for changes:
  – PO fit, if we recently had a review
  – RPBI
  – Very low or very high percent getting item correct
  – Low performing distractors
  – Long history of use—some number or picture changes
Updated Proctor Instructions for CCA Exams

• Exam period is 2.5 hours vs. the previous 3 hours
  – Based on relative timing of 3 hours for 200 item exam
  – Suggest guideline of one minute per item
• Suggest exam start time is 9:30 instead of 9:00
• Photo ID required
• Exams placed, vs. examinees choose where to sit
• Late arrivals
• Wording streamlined, reorganized
Upcoming PO Reviews

• Nutrient Management
• Soil & Water Management
Course Offerings
Reasons for Going to Exam Software

- Increasingly difficult to track items with addition of India, Mexico, others potentially coming
- Cross referencing is a nightmare
- Allow more input into system from stakeholders
- Help states/regions keep track of their items
- Additional features:
  - Keeps track of changes—legal documentation
  - Exam performance
  - Allows item writer to document references, reasons for incorrect distractors
- Prepare us for computer-based testing in the future
Authorize Exam Software
<table>
<thead>
<tr>
<th>Objective Owner</th>
<th>Blueprint</th>
<th>Item Type</th>
<th>Written</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1: Nutrient Management</td>
<td>0</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3.1.1: Basic Concepts of Plant ...</td>
<td>0</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3.1.1.1: List the 18 elements...</td>
<td>---</td>
<td>MC</td>
<td>1</td>
<td>Incomplete</td>
</tr>
<tr>
<td>3.1.1.2: Classify th essential ...</td>
<td>---</td>
<td>MC</td>
<td>0</td>
<td>Incomplete</td>
</tr>
<tr>
<td>3.1.1.3: Describe the function...</td>
<td>---</td>
<td>MC</td>
<td>0</td>
<td>Incomplete</td>
</tr>
<tr>
<td>3.1.1.4: Classify each macro...</td>
<td>---</td>
<td>MC</td>
<td>0</td>
<td>Incomplete</td>
</tr>
<tr>
<td>3.1.1.5: List chemical uptake...</td>
<td>---</td>
<td>MC</td>
<td>0</td>
<td>Incomplete</td>
</tr>
<tr>
<td>3.1.6: Describe how nutrient ...</td>
<td>---</td>
<td>MC</td>
<td>0</td>
<td>Incomplete</td>
</tr>
<tr>
<td>3.1.2: Basic Concepts of Soil Fe...</td>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3.2: Soil &amp; Water Management</td>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3.3: Pest Management</td>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3.4: Crop Management</td>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
The element essential for plant growth is:

A. cadmium.
B. selenium.
C. bromine.
D. copper.
# International Performance Objectives Over Time

<table>
<thead>
<tr>
<th>Year</th>
<th>Nutrient</th>
<th>Soil &amp; Water</th>
<th>Pest</th>
<th>Crop</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>58</td>
<td>79</td>
<td>71</td>
<td>63</td>
<td>271</td>
</tr>
<tr>
<td>2009</td>
<td>58</td>
<td>79</td>
<td>69</td>
<td>58</td>
<td>264</td>
</tr>
<tr>
<td>2007</td>
<td>63</td>
<td>76</td>
<td>69</td>
<td>58</td>
<td>266</td>
</tr>
<tr>
<td>2006</td>
<td>63</td>
<td>76</td>
<td>67</td>
<td>60</td>
<td>266</td>
</tr>
<tr>
<td>2005</td>
<td>63</td>
<td>66</td>
<td>67</td>
<td>60</td>
<td>256</td>
</tr>
<tr>
<td>2004</td>
<td>55</td>
<td>66</td>
<td>67</td>
<td>60</td>
<td>248</td>
</tr>
<tr>
<td>2003</td>
<td>55</td>
<td>66</td>
<td>67</td>
<td>48</td>
<td>236</td>
</tr>
<tr>
<td>2002</td>
<td>55</td>
<td>66</td>
<td>61</td>
<td>48</td>
<td>230</td>
</tr>
<tr>
<td>2001</td>
<td>50</td>
<td>65</td>
<td>61</td>
<td>48</td>
<td>224</td>
</tr>
<tr>
<td>2000</td>
<td>41</td>
<td>65</td>
<td>61</td>
<td>48</td>
<td>215</td>
</tr>
</tbody>
</table>

Multiple part objectives are counted as one
Objectives are a Function of Subject Matter Experts and End-User Review

- Edited document placed into survey form for the input of a wide range of practicing CCAs
- 0=Of no use, 1=Nice to know, 2=Should know, 3=Need to know
- The four-choice ratings scale forces survey respondents to place each objective in a “keep” vs. “toss” category—there is no fence sitting
- With few exceptions, objectives in the past that have scored greater than 1.5 (more responses as 2 or 3) have been retained, those less than 1.5 have been removed
Thinking About a True International Exam

- International Exam is really a North American exam (or more specifically a Canada/U.S. exam)
- Two-part system in Canada/U.S.
- One-exam system in India, Mexico (some items leveraged from U.S./Canada exams)
- Two exam system does not necessarily mean two exam sittings—all could be done within one document
- With a true International Exam, a committee would select performance objectives that would be used worldwide. Another set would be country/region/state/province specific
Discussion Points: True International

• CCAs worldwide would have a minimum standard of knowledge and skills
• Expedite exam review and updating
• Implications for current U.S./Canada program
  – Fewer POs for International Exam
  – POs would need to be added to states/regions/provinces
  – Effort to make the change
• Suggest that in next PO review, POs should be marked as either International or State/Region specific
True International, Continued

- True International Exam could be 150 items
- Country/State/Region 100 items
Notes to self...

- Look at Exam webinar materials
- Exam protocol—make copies?
- States/Regions:
  - Set up a rotating schedule, review 25% of programs each year (approx. 9) Michele and Jane assist with requests and recordkeeping
  - Evaluate Critical needs (have a timeline—i.e., must be fixed in two years)
    - Exam and PO updated in last four years
    - Exam matches POs
    - Validated
    - Incorrect question style
  - Suggestions
    - PO style/organization
    - Improvements in exam writing
## Times for Local Exams Using One Minute Per Item, then Rounding Up

<table>
<thead>
<tr>
<th>Number of Items in Exam</th>
<th>Suggested Time</th>
<th>Number of Exams</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>44</td>
<td>1 hr</td>
<td>1</td>
<td>CA Manure Mgt</td>
</tr>
<tr>
<td>50</td>
<td>1 hr</td>
<td>1</td>
<td>Mid-Atlantic</td>
</tr>
<tr>
<td>75</td>
<td>1 hr 30 min</td>
<td>1</td>
<td>New Mexico</td>
</tr>
<tr>
<td>90</td>
<td>1 hr 30 min</td>
<td>1</td>
<td>CA</td>
</tr>
<tr>
<td>100</td>
<td>2 hr</td>
<td>20</td>
<td>Tri, Southeast, Northeast, Prairie, KS, KY, MI, MO, NE</td>
</tr>
<tr>
<td>102</td>
<td>2 hr</td>
<td>1</td>
<td>HI</td>
</tr>
<tr>
<td>120</td>
<td>2 hr</td>
<td>2</td>
<td>SD, ON</td>
</tr>
<tr>
<td>125</td>
<td>2 hr 30 min</td>
<td>2</td>
<td>IA, WI</td>
</tr>
<tr>
<td>150</td>
<td>2 hr 30 min</td>
<td>1</td>
<td>MN</td>
</tr>
</tbody>
</table>
From a presentation by Sonya Sedivy & Ben Babcock, Psychometric Boot Camp, Association of Test Publishers Conference, February 2012