New Mexico FFA Agronomy Career Development Event

Revised: June 21, 2018

I. PURPOSE

The Agronomy contest is designed to create interest and promote understanding in agronomic sciences by providing opportunities for student recognition through the demonstration of knowledge and skills.

II. COMMON CORE REFERENCES

7th Grade:

MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

8th Grade:

CCSS.ELA-Literacy.RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

9-10th Grade:

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

11-12th Grade:

HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

III. EVENT FORMAT

A. Team Make-up

Three or four individuals per school form a team. All four members will be scored and the top three scores will count towards the team total.

B. Component Descriptions

a. General Knowledge Exam - 160 points (20 questions at 8 points each)

20 objective multiple choice questions will be given to each participant covering all agronomic practices associated with crop production. Each answer is worth five points**.** Questions used will be derived from the "General Knowledge Examination" test bank as well as listed reference materials (See the References section in this document). 8 questions will be derived from the "General Knowledge Exam" test bank with the remaining 12 questions being derived from the listed reference materials.

****Note:**** questions derived from the test bank may be re-worded as long as all information from the original question is included within the re-wording!

(Answers will be recorded in Exam #1 portion of the scantron form. The Horticulture scantron will be used for the Agronomy CDE Event.)

b. Identification - 240 points (48 specimens at 5 points each)
Students will identify 20 plant specimens, 20 seed specimens, and 8 farm equipment specimens. Ideally, the plants should be live specimens and can represent any stage of development. However, they could be press mounts or photographs. Plant specimens should be equally divided between crop and weed plants. Each seed specimen must be real seed, no photographs of seeds. Seed specimens should be equally divided between crop and weed seeds. Specimens can only come from the ID list's provided. Each specimen will be worth five points.

****Note:**** Some ID lists will include scientific names which are provided to assist in finding reference materials for proper specimen identification. Students are not required to know the scientific name for any New Mexico Agronomy CDE specimen!
(Answers will be recorded in the top Identification division on the back of the scantron using 1-48. Each specimen has an assigned number on its ID list. Use these numbers for scantron answers.)

c. Placing classes - 300 points (6 classes at 50 points each)
There will be up to six placing classes each having four samples. Students will rank the four samples in proper order based on quality, uniformity, and shelf life of each sample. Two class will be representative of each of the following categories; grain crops (seed samples), forage crops (loose or bailed hay or green chop), and fruit or vegetable crops (fruits, berries, leaves, tubers etc). Class specimens will only be chosen from the provided "Crops ID list".
(Answers will be recorded in the placing classes portion of the scantron.)

d. Assessments and Solutions - 240 points (20 questions at 12 points each)
This section of the contest will be an activity based and questions component. The purpose of this component is to create some problems that participants will have to solve as well as possible answer questions related to the problems. All questions will be derived from handout materials which are provided to each student during the event. Each of the assessment/solution questions will be worth 12 points. There will be a maximum of 20 assessment/solution questions for the event. Assessment solution questions will come from the following areas:

<u>Soils</u>
- soil survey reports
- soil texture/structure

<u>Crop planting and planning</u>
- acreage calculations
- tillage practices
- crop reports (including yield and variety assessment)
- seeding rates
- fertilizer application rates and calculations

<u>Crop management</u>
- herbicide labels
- insecticide labels
- irrigation rates

(Answers will be recorded in the Assessment and Solution portion of the scantron form.)

e. Insect Identification – 120 points (5 specimens totaling 24 points each)
This component will consist of identifying insects. Additionally students will have to identify characteristics related to the individual insect. Students will identify five insects (8 points each) along with the following characteristics for each insect identified:

a. Life cycle of each specimen (8pts.)
b. Mouth part (8pts.)

(Cards must be placed at each insect specimen identifying scantron question numbers, for specimen ID, life cycle, and mouth part. Answers will be recorded in the bottom identification division on the back of the scantron form 1-20. Where, 1 through 3 are used for the first insect specimen with question 1 used for insect ID and questions 2 & 3 used for that insect's characteristics. Likewise questions 4-6 are associated with insect #2, etc.)

IV. SCORING

General Knowledge Exam	160 points
Identification	240 points
Placing Classes	300 points
Assessment/Solutions	240 points
Insect Identification	120 points
Individual Score	1060 points
Team Score	2700 points

V. TIE BREAKER

1. According to judgingcard.com program.

- all references are listed on the following pages -

VI. REFERENCES (by component section)

General Knowledge Exam

a. Test Bank

1. New Mexico FFA Agronomy CDE Test Bank 2014 Download the pdf version on the New Mexico FFA website <*http://www.nmffa.org*>

b. Extension Publication References (References from past years may be reused)

Note: The following 8 references will be used to derive questions for the General Knowledge Exam*

2. Certified Seed Reviewed by Carrillo, Tracey, New Mexico State University, Cooperative Extension Service, Guide A-131. June 2010. *pdf available at* <*http://aces.nmsu.edu/pubs/_a/A131.pdf*>.

3. Dodder (Cuscuta spp.) Biology and Management by Ashigh, J. and Marquez, E.E., New Mexico State University, Cooperative Extension Service, Guide A-615. January 2010. *pdf available at* <*http://aces.nmsu.edu/pubs/_a/A615.pdf*>.

4.Sawtoothed Grain Beetle, Insect Diagnostic Laboratory, Cornell University, Dept. of Entomology, 2144 Comstock Hall, Ithaca NY 14853-2601. *Download pdf: Insect Diagnostic Laboratory Factsheet: Sawtoothed Grain Beetle from* <*http://idl.entomology.cornell.edu/files/2013/11/Sawtoothed-Grain-Beetle-1gq0pht.pdf*>.

5. Know What Is in a Bag of Seed Reviewed by Carrillo, Tracey, New Mexico State University, Cooperative Extension Service, Guide A-216. June 2010. *pdf Available at* <*http://aces.nmsu.edu/pubs/_a/A216.pdf*>.

6. Plant Identification Basics by Mangold, J. and Parkinson, H., Montana State University Extension Service, September 2013. *pdf available at* <http://msuextension.org/publications/AgandNaturalResources/MT201304AG.pdf>.

7. Soil Analysis: A Key to Soil Nutrient Management by Baker, R.D., Ball, S.T., Flynn R. New Mexico State University, Cooperative Extension Service, Guide A-137, September 1997. *pdf Available at* <*http://aces.nmsu.edu/pubs/_a/A137.pdf*>.

8. Understanding Seeding Rates, Recommended Planting Rates, and Pure Live Seed (PLS) by Houck, M.J., Plant Materials Technical Note No. 11, United States Department of Agriculture, Natural Resources Conservation Service, July 2009. *pdf available at* <*http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/lapmctn9045.pdf*>.

9. Variegated Cutworm in New Mexico Hay by Pierce, J.B., New Mexico State University, Cooperative Extension Service, Guide A-335. May 2011. *pdf Available at* <*http://aces.nmsu.edu/pubs/_a/A335.pdf*>.

Identification

a. General Plant Identification resources.

10. Field identification of the 50 most common plant families in temperate regions (including agricultural, horticultural, and wild species) by Struwe, L.. Rutgers Univer sity, New Brunswick, NJ, USA. 2009. Published by the author, available at <*http://www.rci.rutgers.edu/~struwe/*>.

11. Plant Identification Basics by Mangold, J. and Parkinson, H., Montana State University Extension Service, September 2013. *pdf available at* <http://msuextension.org/publications/AgandNaturalResources/MT201304AG.pdf>.

12. Plant ID Basics by Sellers, B.A., University of Florida, IFAS Extension. 2009. *Slides available at* <*http://weedext.ifas.ufl.edu/slides/Plant_ID_Basics/index.html*>.

13. Identifying Pasture Grasses by Undersander, D., Casler, M., and Cosgrove, D., Cooperative Extension of the University of Wisconsin-Estension, publication-A3637. 1996. *pdf available at* <*http://learningstore.uwex.edu/assets/pdfs/A3637.pdf*>

14. Plant Identification, Plant Materials Technical Note No. 5, United States Department of Agriculture, Natural Resources Conservation Service, September 2010. *pdf available at* <*http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/wapmctn6329.pdf*>.

15. Identification: Characteristics of Grasses, Agriculture and Natural Resources, University of California. 2014. available at: <http://www.ipm.ucdavis.edu/PMG/WEEDS/ID/idcharac.html>.

b. Crops plants and seeds identification resources

16. Crops CDE ID powerpoints, Indiana 4-H Youth Development, Purdue University Extension. 2008. *available at:* <http://www.four-h.purdue.edu/cde/crops.cfm>.

(Powerpoint slides showing several specimens of crop plant and seed id and weed plant and seed id. Slides highlight distinguishing characteristics.)

17. Cucurbit Seed Production, An organic seed production manual for seed growers in the Mid-Atlantic and Southern U.S., Carolina Farm Stewardship Association, 2005. available at: <http://www.carolinafarmstewards.org/wp-content/uploads/2012/05/CucurbitSeedProductionver1.4.pdf>.

(This resource covers cucumber, pumkins, and squash. It includes information about plant and seed characteristics. It also shows photos and gives information about several of the insects on the Agronomy insect list.)

18. Forage Identification Pages, Purdue University, Departmant of Agronomy, Agronomy Extension, 2007. *available at:* <http://www.agry.purdue.edu/ext/forages/ForageID/forageid.htm> .

(Covers stem, leaf, flower, and seed characteristics for alfalfa, Ladino clover, sweet clover, red clover, orchardgrass, tall fescue, timothy, and sudangrass.)

19. Seed ID Workshop, The Ohio State University, Ohio Agricultural Research and Development Center. 2009. *available at:* <http://www.oardc.ohio-state.edu/seedid> .

(photos for about half of the crops seed id specimens.)

c. Weeds plants and seeds identification resources

20. Weeds of the West (Fifth Edition) by Larry C. Burrill, Steven A. Dewey, David W. Cudney, B. E. Nelson, Tom Whitson,Tom D. Whitson, L. C. Burrill. Paperback, 630 Pages, Published 1996.

(This is a great book describing the majority of the weed species in the west. It usually has a couple of photos and descriptive plant characteristics).

21. Weed Id Pages, Weeds Society of America. 2014. available at: <*http://wssa.net/weed/weedidentification/weed-id-pages*>.

(This resource lists all the university weed identification websites. Follow the listings under "Agronomic Crop Weeds". You will find plenty of weed id resources at this one site.)

22. Weed Information, New Mexico State University, Weed Science. 2014. *available at:* <*http://weeds.nmsu.edu*>.

d. Entomology Insect Identification resources

23. Who Let the Bugs Out?: A Beginner's Guide to Managing Radical Insects by Timothy J. Gibb. Purdue University, 2013. *available at:* <http*://extension.entm.purdue.edu/radicalbugs/default.php?page=home*>.

24. One Hundred Common Insects of New Mexico by Richman, David B., Sutherland, Carol A., and Oseto, Y., New Mexico Cooperative Extension Service, November 1993. < *http://aces.nmsu.edu/pubs/_circulars/CR570.pdf*>

25. Indiana 4-H Entomomogy, Insect Flashcards, Purdue University Extension. 2011. available at: <*http://extension.entm.purdue.edu/4hyouth/pdf/Flashcards_web.pdf*>.

(Great resource containing photos and descriptive information for most of the NM Agronomy listed insects).

26. A Field Guide to Common Texas Insects, Texas A&M University, Department of Entomology. 2012. *available at:* <*https://insects.tamu.edu/fieldguide*>.

(Insects are sorted by Order. Photos and description of most of the NM Agronomy listed insects).

27. Insect Diagnostic Laboratory, Cornell Cooperative Extension, College of Agriculture and Life Sciences at Cornell University. *available at:* <*http://idl.entomology.cornell.edu/factsheets*>.

(This resource does not include of lot of the listed insects, but the ones it does have an entire pdf factsheet dedicated to them.)

28. Insect Images, Center for Invasive Species and Ecosystem Health. The University of Georgia. 2010. *available at:* <*http://www.insectimages.org*>.

(This resource has an extensive photo database for most any insect imaginable. This is primarly a photo site and does not include descriptive information.)

e. Equipment

There are no reference resources for this portion of the Agronomy CDE. A simple Google search for the items on the equipment list will provide the student with plenty of images and information for each equipment specimen.

Assessment and Solution

a. Practicum resources

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. [January 21, 2014]. available at: <http://websoilsurvey.nrcs.usda.gov/app/>.

(Soils practicum questions will come from a web soil survey from this source and will be handed out to each student at the event. The "Yumma-Wellton practicum example", found on the New Mexico FFA website under the Agronomy CDE, is an example of a soil site survey that has been used for the National Agronomy CDE. It is highly recommended that you become familiar with this site and with the surveys that can be produced using this resource. Print out a site survey report for your local area and look over all the information that it has available.)

Contact Information

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