

Eastern Region FFA Agronomy Career Development Event

Purpose

To create interest and promote understanding in agronomy and crop management by providing opportunities for recognition through the demonstration of skills and proficiencies.

Objectives

1. To demonstrate basic knowledge of agronomic sciences.
2. To explore career opportunities, skills and proficiencies in agronomy and crop related industries.
3. To determine the ability to identify agronomic:
 - Crops
 - Weeds
 - Seeds
 - Insects
 - Diseases
 - Nutrient Deficiencies
 - Crop Disorders
4. To evaluate a scenario and develop a crop management plan including input selection, crop production and marketing.
5. To demonstrate an understanding of sustainable agriculture and environmental stewardship through the use of Integrated Pest Management and Best Management Practices.

Rules and Procedures

1. The Eastern Region FFA Agronomy CDE Superintendents will be in charge of this event.
2. Team size shall be four members. All four members will be scored and all four scores will count towards the team total.
3. Under no circumstance will any participant be allowed to handle any of the items in the identification portion of the practicums unless instructed.
4. All written material will be furnished for the event. No written materials such as tests, problems or worksheets shall be removed from the site.
5. The event will include one team activity and five annual practicums.
6. The event will be completed in approximately 2 hours.
7. Questions may be directed to:

Steven A. Gower, Eastern Region Agronomy CDE Superintendent
Michigan State University Diagnostic Services
113 Center for Integrated Plant Systems
East Lansing, MI 48824

Office: 517-432-9693
Email: sgower@msu.edu

Team Activity

Part 1: Team Management Plan (160 points total)

140 points maximum for management plan

20 points awarded by judges for teamwork

Students will be provided a scenario of an agronomic situation in which they are to develop a management plan. Teams will be required to develop a written plan that addresses the question in the scenario. Teams will submit their written plan at the end of 50 minutes on paper that is provided. There is no oral presentation.

Possible scenario:

Your field measures 1500 ft. X 1750 ft. The field is a silt-loam soil type with a 3 percent slope and no previous drainage problems. You have all necessary equipment. The target plant population for this corn field is 24,000 plants per acre. The growing season is 120 days. Your current crop is a forage legume (i.e. alfalfa/red clover mix). You will rotate to a broadleaf crop following the harvest of the corn. This field has the following weed problems: yellow foxtail, pigweed, velvetleaf and field bindweed.

Develop a management plan that includes but is not restricted to the following: the variety of corn, the amount of seed, projected yield, tillage system, weed control program and fertilization plan.

The following materials are provided:

- soil test
- seed tag information
- variety trial data
- herbicide labels
- seed, fertilizer, and herbicide costs
- county soil survey maps
- plus any other pertinent information

Individual Activities

Part 2: Plant Identification (80 points)

Students will identify 20 weed and/or crop plants using pressed plant mounts and/or live plants. The plant specimen used can be any stage of development, from seedling stage to full maturity. The following is a list of possible plant specimens (4 points each)

Plants

Alfalfa	Cranberry
Barley	Crownvetch
Barnyardgrass	Cucumber
Bindweed (hedge or field)	Curly Dock
Birdsfoot Trefoil	Dandelion
Buckhorn Plantain	Eastern Black Nightshade
Canada Thistle	Fall Panicum
Common cocklebur	Field Pennycress
Common Lambsquarters	Foxtail (any)
Common Milkweed	Giant Ragweed
Common Ragweed	Jimsonweed
Corn	Johnsongrass
Crabgrass (large or smooth)	Kentucky Bluegrass

Morningglory (any)	Strawberry
Oats	Sweetclover
Orchardgrass	Tall Fescue
Peanut	Timothy
Pigweed	Tobacco
Potato	Tomato
Quackgrass	Velvetleaf
Red Clover	Watermelon
Rye	Wheat
Ryegrass (annual or perennial)	White Clover
Shattercane	Wild Carrot
Shepherd's-purse	Wild Garlic/Onion
Smartweed	Wild Mustard
Smooth Bromegrass	Yellow Nutsedge
Soybean	

Part 3: Insect Identification (80 points)

Students will identify 10 specimens according to insect name, economic impact, and life cycle that most often causes an economic impact to the crop. (ID: 4 points; economic impact: 2 points; life cycle: 2 points = 8 points total per specimen)

1. Possible insects:

- Alfalfa Plant Bug (adult)
- Alfalfa Weevil (larvae, adult, or damage)
- Aphids (adult)
- Armyworm (larvae or adult)
- Bean Leaf Beetle (adult)
- Colorado Potato Beetle (larvae or adult)
- Cutworm (larvae or adult)
- European Corn Borer (larvae, adult, or damage)
- Flea beetle (adult)
- Green Lacewing (adult)
- Honeybee (adult)
- Japanese Beetle (adult)
- Lady Beetle (larvae or adult)
- Leafhopper (adult or damage)
- Mexican Bean Beetle (larvae or adult)
- Northern Corn Rootworm (adult or damage)
- Spotted Cucumber Beetle (southern corn rootworm) (adult or damage)
- Stinkbug (adult)
- Striped Cucumber Beetle (adult)
- Tarnished Plant Bug (adult)
- Western Corn Rootworm (larvae, adult or damage)
- Whitefly (adult)

2. Economic impact:

- None or Predatory (beneficial)
- Destruction of Fruit/Flower
- Destruction of Vegetative Parts (roots and leaves)
- Destruction by Removal of Plant Fluids

3. Possible life cycle:

- Egg
- Nymph
- Larvae
- Pupa
- Adult
- Both Nymph and Adult
- Both Larvae and Adult
- None or Predatory (beneficial)

Part 4: Seed Identification (80 points)

Students will identify 20 weed and/or crop seeds. The following is a list of possible seed specimens. (4 points per specimen)

Seeds

- | | |
|----------------------|--------------------------------|
| Alfalfa | Oats |
| Barley | Orchardgrass |
| Barnyardgrass | Peanut |
| Birdsfoot trefoil | Pigweed |
| Buckhorn plantain | Quackgrass |
| Canada thistle | Red clover |
| Common cocklebur | Rye |
| Common lambsquarters | Ryegrass (annual or perennial) |
| Common milkweed | Smartweed |
| Common ragweed | Smooth brome grass |
| Corn, dent | Soybean |
| Corn, pop | Sweetclover |
| Corn, sweet | Tall fescue |
| Crownvetch | Timothy |
| Cucumber | Tomato |
| Curly dock | Velvetleaf |
| Dandelion | Watermelon |
| Foxtail (any) | Wheat |
| Giant ragweed | Wild carrot |
| Jimsonweed | White Clover |
| Johnsongrass | Wild garlic/onion |
| Kentucky bluegrass | Wild mustard |
| Morningglory (any) | |

Part 5: Crop Disorder Identification (80 points)

Students will identify 10 crop disorders according to name, causal agent, and damage. (ID: 4 points; causal agent: 2 points; damage: 2 points = 8 points total per specimen)

1. Possible Disorders:

- | | |
|---------|----------------------|
| Blight | Hail |
| Canker | Herbicide |
| Drought | Iron Chlorosis |
| Ergot | Mold |
| Frost | Mosaic |
| Galls | N, P, K Deficiencies |

Powdery Mildew
Root Rot
Rust
Scab

Smut
Stalk Rot
Wilt
Wind Damage

2. Causal Agent:

Bacteria
Cultural/Environmental
Fungi
Mechanical
Nematodes
Nutritional
Virus

3. Part of Plant Damaged:

No Damage
Fruit or Flower
Vegetative Parts
Vascular Bundles
More Than One Area

Part 6: Forage Evaluation and Placement (60 points)

Students will evaluate and place forage samples based on quality and desirable forage characteristics. Characteristics include, but not limited to: forage maturity, leafiness, fineness of stems, color, odor, mold and dust, foreign matter, fineness and uniformity of cut, and moisture content.

(forage evaluation: 1 sample, 30 points)

(forage placement: 1 class with 4 cuts, 30 points)

Scoring:

Part 1: Team Management Plan	160 points
Part 2: Plant Identification	80 points
Part 3: Insect Identification	80 points
Part 4: Seed Identification	80 points
Part 5: Crop Disorder Identification	80 points
Part 6: Forage Evaluation and Placement	60 points
	=====
Total:	540 points

Resources:

State Agronomy Guide
County Soil Surveys
Various Herbicide and Pesticide Labels
Seed Tags
Soil Tests

Local Extension Service
Soil and Water Conservation Service
Chemical Dealers or Internet.
Seed Dealers
Local Extension Service

Eastern Region FFA Agronomy CDE

Name: _____

Chapter: _____

State: _____

Part 1: Team Management Plan

Team Activity (160 points total)

140 points maximum for management plan
20 points awarded by judges for teamwork

Possible scenario:

Your field measures 1500 ft. X 1750 ft. The field is a silt-loam soil type with a 3 percent slope and no previous drainage problems. You have all necessary equipment. The target plant population for this corn field is 24,000 plants per acre. The growing season is 120 days. Your current crop is a forage legume (i.e. alfalfa/red clover mix). You will rotate to a broadleaf crop following the harvest of the corn. This field has the following weed problems: yellow foxtail, pigweed, velvetleaf and field bindweed.

Develop a management plan that includes but is not restricted to the following: the variety of corn, the amount of seed, projected yield, tillage system, weed control program and fertilization plan. The following materials are provided:

- soil test
- seed tag information
- variety trial data
- herbicide labels
- seed, fertilizer, and herbicide costs
- county soil survey maps
- plus any other pertinent information

The following are questions that could be asked and possible points awarded.

1. Tillage System	5 points
2. Seed Variety	5 points
3. Seeding Rate	10 points
4. Bags of Seed Needed for Field	10 points
5. Herbicide Selection	10 points
6. Herbicide Rate/A	10 points
7. Herbicide Cost/A	10 points
8. Herbicide Purchased for Field	10 points
9. Fertilizer Selection	10 points
10. Fertilizer Amount/A	10 points
11. Fertilizer Cost/A	10 points
12. Fertilizer Purchased for Field	10 points
13. Projected Yield	10 points
14. Economic Breakeven Point	20 points
	=====
	140 points

Bonus: 20 points based on Teamwork

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Fertilizer Compounds and Costs:

<u>FERTILIZER ANALYSIS (ALL DRY)</u>	<u>PRODUCT NAME</u>	<u>COST PER TON</u>
0-0-60	Potash	\$152.78
0-46-0	Triple superphosphate	\$221.83
34-0-0	Ammonium nitrate	\$133.51
46-0-0	Urea	\$157.25

Herbicide Costs:

<u>HERBICIDE</u>	<u>CONTAINER</u>	<u>COST PER CONTAINER</u>
Command 3ME	2.5 gallons	\$76.50
Poast 1.53L	2.5 gallons	\$85.25
Prefar 4-E	2.5 gallons	\$98.50
Prowl 3.3EC	2.5 gallons	\$92.00
Python 80WDG	1 pound	\$156.00

These costs are for event use only. They are not necessarily market costs.

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Conversions and Equations:

1 acre = 43, 560 square feet

1 mile = 5,280 feet

1 yard = 3 feet

1 gallon = 128 fluid ounces

1 gallon = 4 quarts

1 gallon = 8 pints

2 pints = 1 quart

3,785 milliliters = 1 gallon

454 grams = 1 pound

16 ounces (dry) = 1 pound

2,000 pounds = 1 ton

Sprayer Calibration Equations:

$$\text{GPM} = \frac{\text{GPA} \times \text{MPH} \times \text{W}}{5,940}$$

$$\text{GPA} = \frac{5,940 \times \text{GPM}}{\text{MPH} \times \text{W}}$$

Eastern Region FFA Agronomy CDE

Name: _____

Chapter: _____

State: _____

Part 2: Plant Identification

Possible Plant Specimens (4 points each, 80 points total) Write the number in the box labeled "Member Answer"				Specimen Number	Member Answer
101	Alfalfa	137	Shattercane	1.	
102	Barley	138	Shepherd's-purse	2.	
103	Barnyardgrass	139	Smartweed	3.	
104	Bindweed (hedge or field)	140	Smooth Bromegrass	4.	
105	Birdsfoot Trefoil	141	Soybean	5.	
106	Buckhorn Plantain	142	Strawberry	6.	
107	Canada Thistle	143	Sweetclover	7.	
108	Common Cocklebur	144	Tall Fescue	8.	
109	Common Lambsquarters	145	Timothy	9.	
110	Common Milkweed	146	Tobacco	10.	
111	Common Ragweed	147	Tomato	11.	
112	Corn	148	Velvetleaf	12.	
113	Crabgrass (large or smooth)	149	Watermelon	13.	
114	Cranberry	150	Wheat	14.	
115	Crownvetch	151	White Clover	15.	
116	Cucumber	152	Wild Carrot	16.	
117	Curly Dock	153	Wild Garlic/Onion	17.	
118	Dandelion	154	Wild Mustard	18.	
119	Eastern Black Nightshade	155	Yellow Nutsedge	19.	
120	Fall Panicum			20.	
121	Field Pennycress				
122	Foxtail (any)				
123	Giant Ragweed				
124	Jimsonweed				
125	Johnsongrass				
126	Kentucky Bluegrass				
127	Morningglory (any)				
128	Oats				
129	Orchardgrass				
130	Peanut				
131	Pigweed				
132	Potato				
133	Quackgrass				
134	Red Clover				
135	Rye				
136	Ryegrass (annual or perennial)				

Eastern Region FFA Agronomy CDE

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Part 3: Insect Identification

Write the number in the box labeled "Member Answer"	Member Answer	Possible Points	Member Score	Possible Answers
1. Insect Specimen #: Life Cycle #: Economic Impact #:		4		<p><u>Insect Specimens</u></p> <p>100 Alfalfa Plant Bug (adult) 101 Alfalfa Weevil (larvae, adult, or damage) 102 Aphids (adult) 103 Armyworm (larvae or adult) 104 Bean Leaf Beetle (adult) 105 Colorado Potato Beetle (larvae or adult) 106 Cutworm (larvae or adult) 107 European Corn Borer (larvae, adult, or damage) 108 Flea Beetle (adult) 109 Green Lacewing (adult) 110 Honeybee (adult) 111 Japanese Beetle (adult) 112 Lady Beetle (larvae or adult) 113 Leafhopper (adult or damage) 114 Mexican Bean Beetle (larvae or adult) 115 Northern Corn Rootworm (adult or damage) 116 Spotted Cucumber Beetle (adult or damage) 117 Stinkbug (adult) 118 Striped Cucumber Beetle (adult) 119 Tarnished Plant Bug (adult) 120 Western Corn Rootworm (larvae, adult, or damage) 121 Whitefly (adult)</p> <p><u>Life Cycle That Most Often Causes Economic Impact</u></p> <p>201 Egg 202 Nymph 203 Larvae 204 Pupa 205 Adult 206 Both Nymph and Adult 207 Both Larvae and Adult 208 None or Predatory (beneficial)</p> <p><u>Economic Impact of Insect Life Cycle Selected Above</u></p> <p>301 None or Predatory (beneficial) 302 Destruction of Fruit/Flower 303 Destruction of Vegetative Parts 304 Destruction by Removal of Plant Fluids</p>
		2		
		2		
2. Insect Specimen #: Life Cycle #: Economic Impact #:		4		
		2		
		2		
3. Insect Specimen #: Life Cycle #: Economic Impact #:		4		
		2		
		2		
4. Insect Specimen #: Life Cycle #: Economic Impact #:		4		
		2		
		2		
5. Insect Specimen #: Life Cycle #: Economic Impact #:		4		
		2		
		2		
6. Insect Specimen #: Life Cycle #: Economic Impact #:		4		
		2		
		2		
7. Insect Specimen #: Life Cycle #: Economic Impact #:		4		
		2		
		2		
8. Insect Specimen #: Life Cycle #: Economic Impact #:		4		
		2		
		2		
9. Insect Specimen #: Life Cycle #: Economic Impact #:		4		
		2		
		2		
10. Insect Specimen #: Life Cycle #: Economic Impact #:		4		
		2		
		2		
Total Score:		80		

Eastern Region FFA Agronomy CDE

Name: _____

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Part 4: Seed Identification

Possible Seed Specimens (4 points each, 80 points total) Write the number in the box labeled "Member Answer"		Specimen Number	Member Answer
201 Alfalfa	237 Timothy	1.	
202 Barley	238 Tomato	2.	
203 Barnyardgrass	239 Velvetleaf	3.	
204 Birdsfoot Trefoil	240 Watermelon	4.	
205 Buckhorn Plantain	241 Wheat	5.	
206 Canada Thistle	242 White Clover	6.	
207 Common Cocklebur	243 Wild Carrot	7.	
208 Common Lambsquarters	244 Wild Garlic/Onion	8.	
209 Common Milkweed	245 Wild Mustard	9.	
210 Common Ragweed		10.	
211 Corn, Dent		11.	
212 Corn, Pop		12.	
213 Corn, Sweet		13.	
214 Crownvetch		14.	
215 Cucumber		15.	
216 Curly Dock		16.	
217 Dandelion		17.	
218 Foxtail (any)		18.	
219 Giant Ragweed		19.	
220 Jimsonweed		20.	
221 Johnsongrass			
222 Kentucky Bluegrass			
223 Morningglory (any)			
224 Oats			
225 Orchardgrass			
226 Peanut			
227 Pigweed			
228 Quackgrass			
229 Red clover			
230 Rye			
231 Ryegrass (annual or perennial)			
232 Smartweed			
233 Smooth Bromegrass			
234 Soybean			
235 Sweetclover			
236 Tall Fescue			

Eastern Region FFA Agronomy CDE

Name: _____

Chapter: _____

State: _____

Part 5: Crop Disorder Identification

Write the number in the box labeled "Member Answer"	Member Answer	Possible Points	Member Score	Possible Answers
1. Crop Disorder Specimen #: Causal Agent #: Part of Plant Damaged #:		4		<u>Crop Disorder Specimens</u> 101 Blight 102 Canker 103 Drought 104 Ergot 105 Frost 106 Gall 107 Hail 108 Herbicide 109 Iron Chlorosis 110 Mold 111 Mosaic 112 N,P,K Deficiencies 113 Powdery Mildew 114 Root Rot 115 Rust 116 Scab 117 Smut 118 Stalk or Stem Rot 119 Wilt 120 Wind Damage <u>Causal Agent</u> 201 Bacteria 202 Cultural/Environmental 203 Fungi 204 Mechanical 205 Nematodes 206 Nutritional 207 Virus <u>Part of Plant Damaged</u> 301 No Damage 302 Fruit or Flower 303 Vegetative Parts 304 Vascular Bundles 305 More Than One Area
		2		
		2		
2. Crop Disorder Specimen #: Causal Agent #: Part of Plant Damaged #:		4		
		2		
		2		
3. Crop Disorder Specimen #: Causal Agent #: Part of Plant Damaged #:		4		
		2		
		2		
4. Crop Disorder Specimen #: Causal Agent #: Part of Plant Damaged #:		4		
		2		
		2		
5. Crop Disorder Specimen #: Causal Agent #: Part of Plant Damaged #:		4		
		2		
		2		
6. Crop Disorder Specimen #: Causal Agent #: Part of Plant Damaged #:		4		
		2		
		2		
7. Crop Disorder Specimen #: Causal Agent #: Part of Plant Damaged #:		4		
		2		
		2		
8. Crop Disorder Specimen #: Causal Agent #: Part of Plant Damaged #:		4		
		2		
		2		
9. Crop Disorder Specimen #: Causal Agent #: Part of Plant Damaged #:		4		
		2		
		2		
10. Crop Disorder Specimen #: Causal Agent #: Part of Plant Damaged #:		4		
		2		
		2		
Total Score:		80		

Eastern Region FFA Agronomy CDE

Name: _____

Chapter: _____

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Part 6: Forage Evaluation and Placement

Forage Evaluation (1 sample, 30 points total)

In-depth evaluation of 1 forage sample based on desirable forage characteristics. Write the "Rating" number corresponding to the Quality Characteristic in the box labeled "Member Answer."

Quality Characteristics	1	Rating 2	3	Member Answer	Possible Points	Member Score
Botanical ID:	Grass	Grass/Legume Mix	Legume		6	
Leafiness:	Very Few Leaves	Some Leaves	Many Leaves		4	
Fineness of Stems:	Fine	Medium	Coarse		4	
Color:	Green	Brown	Black		4	
Odor:	Fresh, Pleasant	In-between	Musty		4	
Mold and Dust:	None	Some	Much		4	
Foreign Matter:	None	Some	Much		4	
			Total Score		30	

Forage Placement (1 class, 30 points total)

Rank 4 samples (cuts) of hay based on overall forage quality from "best" to "worst".

Class 1: _____