Agronomy

A Special Project of the South Dakota FFA Foundation

Important Note:

Please thoroughly read the General Rules at the beginning of this handbook for complete rules and procedures that are relevant to all South Dakota FFA Career Development Events.

Purpose

The purpose of the FFA Agronomy Career Development Event is to create interest in and promote the understanding of agronomy by providing opportunities for recognition through the demonstration of skills and proficiencies.

Objectives

- To demonstrate basic knowledge of agronomic sciences.
- To explore career opportunities, skills, and proficiencies in the agronomy industry.
- To demonstrate understanding of sustainable agriculture and environmental stewardship.
- To determine the ability to identify agronomic:

Crops	Plant Nutrient Deficiencies
Weeds	Plant Disorders
Seeds	Crop Grading and Pricing
Insects	Equipment
Diseases	

Event Rules

Each team will be comprised of three or four members.

The top three individual scores will be used to determine the final team score.

Event Format

The Agronomy CDE shall consist of plant and seed identification, grain grading seed quality judging classes, and a written test.

Written Examination – 300 points

The written examination will consist of fifty (50) multiple-choice problems valued at six (6) points each.

Plant and Seed Identification – 375 points

Participants will be given 10 minutes per class.

Fifteen samples are to be identified in each group.

The participant will select the number following their choice from the list provided (code sheet) and the participant will fill in the bubble codes for each sample.

Seed Quality Judging – 350 points

Participants will be given 10 minutes per class.

Seven classes of seed quality judging classes with 4 samples each will be chosen from the following:

a. Hard Red Spring Wheat (HRS)
b. Hard Red Winter Wheat (HRW)
c. Durum Wheat
d. Oats
e. Barley
f. Flax
g. Rye
h. Sweet Clover
i. Grain Sorghum
j. Soybeans

Scoring

	Possible Points
Identification	375
Seed Quality Judging	350
Written Examination	300
Total Possible Individual Score	**1025**
Total Possible Team Score ***(3 participants count)***	**3075**

Tiebreakers

In the case of a team tie, the order to break the tie will be:

Total Written Exam Score from Top 3 Individuals
Total Identification Score from Top 3 Individuals

In the case of an individual tie, the order to break the tie will be:

Individual Written Exam Score
Individual Identification Score
Total Placing Classes

References and Resources

A. National FFA Core Catalog – Past CDE Materials (http://shop.ffa.org/cde-materials-c1289.aspx)
B. *Plant and Soil Science*. Rick Parker, Delmar Cengage Learning.

Seed Quality Judging Standards for Placing Samples of Small Grain, Grain Sorghum, Alfalfa, Sweet Clover, and Flax

The order in which the seed quality factors are listed is significant. Factor 1, as described, has no faults and would be placed first in a judging class. Other factors are listed in descending order and samples containing the same quantity of the various factors would be placed accordingly.

Temporary Faults are factors which may impair the crop for only one season when used for <u>seed</u> purposes. These factors generally are corrected in the next years' crop without adverse effects on either the crop or soil.	
1. Clean, Sound, Pure Seed	Shall be seed which is matured, plump, uniform in size and shape, having a clear, bright uniform color, good luster and wholesome color.
2. Inert Matter	Shall be stems, chaff, dirt, broken pieces of seed (less than one half original size), or any similar material or other foreign matter which can be readily removed from the seed by the use of appropriate cleaning devices. (See also footnote No. 2 under fault #9 and #10.).
3. Separable Non-Noxious Weed Seed	The interpretation will be on the basis of being able to remove the weed seed with a farm-fanning mill (See footnote 1). Examples: Separable — wild buckwheat or green foxtail in cereals; wild buckwheat or giant ragweed in small seeded legumes.
4. Discolored, Sound Seed	Shall be seed that is or has been discolored due to climatic soil conditions and maturity. The classification would include seed which has been exposed to excess moisture and which is slightly bleached and somewhat starchy but not badly weathered.
5. Cracked or Mechanically Damaged Seed	Shall be cracked kernels and seeds threshed too closely; kernels or pieces of kernels broken or injured by threshing or handling; or in the case of crops which retain the hulls, such as oats and barley, naked seed or exposures of the tip of the berry, shall be included.
6. Low Weight Per Bushel Sound Seed	Shall be sound seed; however, due to climatic and soil conditions or factors affecting the growth of the crop, lower test weights have resulted. [1]Other than test weight, this factor as described does not affect the seed in any other way. If other factors are equal, a sample of high test weight will be placed over one of lesser weight. The test weight per bushel of any seed lot shall not be below U.S. Federal Standard Numerical Grade No. 3 as listed for the respective crop or crops. If a sample is included in the CDE with a test weight lower than U.S. No. 3, the test weight will be placed on the sample number. Samples so marked would be placed below factor #5.

Minimum Limits of Test Weights

Grades	Wheat	HRS Wheat	All Other Barley	Oats	Rye	Corn	Soybeans	Sorghum	Flax
U.S. #1	58#	60#	47#	36#	56#	56#	56#	57#	40#
U.S. #2	57#	58#	45#	33#	54#	54#	54#	55#	47#
U.S. #3	55#	56#	43#	30#	52#	52#	52#	53#	Sample

7. Damaged Seeds	Shall be any crop that has been stored with excess moisture that has resulted in heat damage, badly weathered or ground damage, or sprouted to such an extent that one is reasonably sure that the germination or vigor of the seed has been greatly damaged. This factor also includes old, discolored legume seeds, etc.
8. Diseases	A sample containing a small, yet unmistakable amount of any or all of the diseases shall be placed below everything listed in the temporary faults. Example diseases: Smut--oats, wheat, barley; Scab—wheat, barley; Ergot—rye.

1. Note (Air-screen cleaner) which makes separation on the basis of seed size and weight.

Permanent Faults (9-12 inclusive) are factors that impair the crop for more than one season. These factors are not corrected in the next year's crop and contaminate the soil.	
1. Other Variety or Class of Crop	Shall be those samples having a class mixture which are most commonly discriminated against in market classes or which can be identified or classified as a mixed variety for seed purposes. Examples: Durum wheat in Hard Red Spring Wheat, or vice versa. Hard Red Winter Wheat in Hard Red Spring Wheat, or vice versa. Two excessive mixtures of over 5% spring and winter wheat could have serious consequences. Mixtures of spring wheat in winter wheat will not survive the winter and stand reduction could result. Winter wheat mixed and planted in the spring will not "vernalize". No seed will be produced on the winter wheat plant; however, these plants will use moisture and nutrients otherwise available to the spring wheat plants. ([2]NOTE—Winter wheat in spring wheat, or vice versa, shall be considered as a similar amount of inert matter and such sample can be placed over #3). Modern wheat breeding programs often use spring and winter wheat types in crossing for the development of a new variety making it very difficult to differentiate between spring and winter wheat on seed characteristics alone. Planting seed of known origin or buying certified seed will assure the grower of getting the kind and variety he wanted.
2. Other Crop Seeds	Shall be seeds of any crop which is classed and commercially grown for seed production and is difficult to separate from the crop being judged. Examples: Winter rye in winter wheat; oats in barley; barley in oats, etc.
3. Inseparable Non-Noxious Weed Seeds	Shall be known as those weed seeds which remain in the crop after the seed crops have been properly cleaned or re-cleaned with a fanning mill (air-screen cleaner). Examples: Giant ragweed or wild rose in small grains, pale smartweed in flax. Weed seeds, which do not have a size, weight, or shape difference from the crop they are in, cannot be separated with an air-screen cleaner.
4. Noxious Weed Seed	a) "PROHIBITED NOXIOUS WEED SEEDS" are seeds of perennial weed plants which reproduce by seed and also propagate by underground stems (rhizomes) of roots which, when established, are highly destructive and difficult to control even though good cultural practices are employed to destroy them. i) field bindweed (Conolvulus arvensis) ii) Russian knapweed (Centaurea repens) iii) leafy spurge (Euphorbia esula) iv) hoary cress (Cardaria draba) v) perennial sow thistle (Sonchus arvensis) vi) Canada thistle (Cirsium arvense) vii) quackgrass (Agropyron repens) viii) horse nettle (Solanum carolinense) b) "RESTRICTED NOXIOUS WEED SEEDS" are seeds of the following weed plants that are very objectionable in fields, lawns, or gardens of this state, but can be controlled by good cultural practices. i) wild oats (Avena fatua) ii) dodder (Cascuta spp.) iii) wild mustard (Brassica arvensis, B. nigra and B. juncea) iv) hedge bindweed (Convolvulus sepium) v) wild carrot (Daucus carota) vi) field penny cress (Thiaspi arvense) vii) annual bluegrass (Poa annua) viii) spotted knapweed (Centaurea masculosa) ix) giant foxtail (Setaria faberi) x) musk thistle (Carduus nutans) xi) plumeless thistle (Carduus acanthoides)

CLARIFICATION OF NOXIOUS WEED LISTS

There exists some confusion as to the proper classification of noxious weeds for the State Agricultural Education Agronomy, Grading and Identification CDE. In reality, two noxious weed lists are in use by the crop industry, namely noxious weed seeds and noxious weed plants. The noxious weed seed classification is the only list of concern for crops CDE because samples are judged on the basis of seed quality. The following lists are presented for purposes of clarification and comparison:

Weed Seed	
Prohibited Noxious Weed Seeds	
Field Bindweed	Russian Knapweed
Leafy Spurge	Hoary Cress
Perennial Sow Thistle	Canada Thistle
Quackgrass	Horse Nettel
Restricted Noxious Weed Seeds	
Wild Oats	Dodder
Wild Mustard	Hedge Bindweed
Field Pennycress	Annual Bluegrass
Spotted Knapweed	Giant Foxtail
Musk Thistle	Plumeless Thistle
Weed Plants	
Primary Noxious Weed Plants	
Field Bindweed	Russian Knapweed
Leafy Spurge	Hoary Cress
Perennial Sow Thistle	Canada Thistle
Purple Loosestrife	
Secondary Noxious Plants	
This classification is determined at the local county level. The weed plants on this list have been determined to be problem plants in the various counties. There are a number of plants common to several county lists.	

Seed Quality Judging Standards for Soybeans

Explanation of Points
A. Freedom from Mixture 1) Not many undesirable weed seeds are found in soybeans and most weed seeds allow for easy separations to be made. Sometimes, however, seeds such as field bindweed, cocklebur, and black nightshade berries may be found in a seed lot. Samples containing any or all of these seeds would be severely discriminated against. 2) Kernels of corn found in a soybean sample would also be discriminated against; however, not so severely as the above weed seeds. 3) Varietal mixtures may be detected by learning to recognize the size, shape, seed coat luster, and hilum color of the different varieties. 4) Inert material may be trash, chaff, pods, stems, and other waste material that would be the least serious fault in this group, but may cause problems in planting unless the seed lot was re-cleaned.
B. Soundness 1) Disease infections on the seed are most important in judging a seed lot for soundness. 2) Evidence of disease is often expressed as a discoloration, or dark colored spots, on the seed. 3) Soybean seed which is low in moisture when combined, elevated, or conditioned is easily damaged by rough handling causing broken and cracked seeds which result in reduced germination and loss of seed vigor. 4) Seed that is either weathered, checked, or discolored would indicate lower quality and seed displaying such characteristics should be discriminated against.
C. Maturity Immaturity in soybeans may be indicated by undersized, greenish colored seeds.
D. Natural Color This characteristic is associated with immaturity. Soybeans that show a mottled appearance are undesirable. Depending on the variety, the seed coat may have a dull luster or a shiny luster. The important point is that the entire sample should be uniform for this trait.
E. Uniformity This factor is of considerable importance in those cases where all the samples in the judging class are pure, well developed, and free from disease. From the viewpoint of the grower, uniformity is of value primarily to make it easier, when planting, to obtain a uniform plant population.

Crop Identification and Forage Seed/Plant Sample Codes

The code numbers shown below are to be used in identifying the samples on the appropriate computer scan sheets. Be sure to use the proper codes for each sample group.

Grain Seed		Weed Seed/Plant				Forage Seed/Plant	
	Code		Code		Code		Code
Amber Durum Wheat	101	Absinth Wormwood	201	Lambsquarters	229	Alfalfa	301
Buckwheat	102	Barnyard Grass	202	Lanceleaf Sage	230	Alsike Clover	302
Flax	103	Blue Lettuce	203	Large Crabgrass	231	Big Bluestem	303
Flint Corn	104	Buffalobur	204	Leafy Spurge	232	Birdsfoot Trefoil	304
Grain Sorghum	105	Bull Thistle	205	Marshelder	233	Blue Grama	305
Hard Red Spring Wheat	106	Canada Thistle	206	Musk Thistle	234	Bromegrass	306
Hard Red Winter Wheat	107	Chickweed	207	Pale Smartweed	235	Buffalo Grass	307
Oats	108	Cocklebur	208	Perennial Sow Thistle	236	Common Foxtail Millet	308
Pinto Field Beans	109	Common Milkweed	209	Prickly Lettuce	237	Creeping Foxtail	309
Popcorn	110	Common Ragweed	210	Prostrate Pigweed	238	Creeping Red Fescue	310
Proso Millet	111	Curly Dock	211	Purslane	239	Crested Wheatgrass	311
Rapeseed (Canola)	112	Dodder	212	Quackgrass	240	Forage Sorghum	312
Rye	113	Downy Bromegrass	213	Redroot Pigweed	241	Green Needlegrass	313
Safflower	114	Dwarf Mallow	214	Russian Knapweed	242	Intermediate Wheatgrass	314
Six-Rowed Barley	115	Field Bindweed	215	Russian Thistle	243	Kentucky Bluegrass	315
Soybeans	116	Field Pennycress	216	Shepherds Purse	244	Orchardgrass	316
Sunflower (Oil Type)	117	Field Sandbur	217	Spotted Knapweed	245	Red Clover	317
Sunflower (Confectionary)	118	Foxtail Barley	218	Velvetleaf	246	Reed Canary Grass	318
Sweet Corn	119	Giant Ragweed	219	Wildlife Buckwheat	247	Russian Wild Rye	319
Triticale	120	Greenflower Pepperweed	220	Wild Carrot	248	Siberian Foxtail Millet	320
Two-Rowed Barley	121	Green Foxtail	221	Wild Mustard	249	Slender Wheatgrass	321
White Dent Corn	122	Gumweed	222	Wild Oats	250	Sudan Grass	322
Yellow Dent Corn	123	Hedge Bindweed	223	Wild Proso Millet	251	Sweet Clover	323
Yellow Mustard	124	Hemp Dogbane	224	Wild Rose	252	Switchgrass	324
		Hoary Cress	225	Wild Sunflower	253	Timothy	325
		Hoary Vervain	226	Witchgrass	254	Western Wheatgrass	326
		Horse Nettle	227	Yellow Foxtail	255	White Clover	327
		Kochia	228				