Agronomy

Revised 6/2022

**Purpose and Standards**

The purpose of the agronomy contest is to create interest and promote understanding in agronomy by providing opportunities for recognition through the demonstration of skills and proficiencies. It is the intention of the contest to provide a venue for students to explore career opportunities, skills, and proficiencies in the agronomy industry. This event blends knowledge as well as critical thinking to evaluate many crop scenarios.

Foundation Standards: Academics Science, 1.d, 1.l, Communications Written and Oral Conventions Listening and Speaking 1.1, 2.2, 1.8, Ethics and Legal Responsibilities, 8.4, Leadership and teamwork, 9.1, 9.2, 9.3, 9.6

Plant and Soil Science Pathway Standards: G1.1-1.6, G5.1, G1.2, G7.1, and G.10.1-10.3

**Contestants**

Teams consist of four members, with all four individual scores counting as the team score. All team members are eligible for individual awards.

Classes

|  |  |  |
| --- | --- | --- |
| **Class** | **Individual Points** | **Team Points** |
| Judging Class 1 | 50 | 200 |
| Judging Class 2 | 50 | 200 |
| Judging Class 3 | 50 | 200 |
| Judging Class 4 | 50 | 200 |
| USDA Grain Grading Class | 50 | 200 |
| Reasons Class 1 | 50 | 200 |
| Reasons Class 2 | 50 | 200 |
| Reasons Class 3 | 50 | 200 |
| Reasons Class 4 | 50 | 200 |
| Identification Part 1 (Plants) | 300 | 1200 |
| Identification Part 2 (Insects) | 50 | 200 |
| Identification Part 3 (Disorders) | 50 | 200 |
| TOTAL | 850 | 3400 |

Tie Breaker

1. The team or individual scoring the highest reason score(s) will be the winner.
2. If a tie still exists, the total score of the individual or team will be used to determine the high individual or team.
3. If a tie still exists, the higher number of correctly spelled specimens in the identification portion will be the winner. Misuse of capitalization will not be counted as a misspelled word.

Sub-contest Awards

Sub-contest awards will be given for high teams and individuals in the following areas: Judging, Identification, and Reasons (Reasons are not included in judging sub-contest score.)

Rules

1. All contestants must participate in seed judging, hay judging, and identification.
2. Contestants are not to take small parcels of the identification samples.
3. Contestants and coaches are invited to ask questions of judges and inspect seed judging and identification samples after the contest.
4. Seed Judging:
	1. Samples will be judged and placed on the basis of their relative merits as seeds and not on the basis of market standards as established by the Federal Grading Standards. Factors enumerated on the attached score card will serve as a guide in evaluating judging factors. Seeds are to be judged on the basis that the seed is to be planted immediately.
	2. The classes of the contest will be made up from grain sorghums, wheat, barley, oats, field beans, blackeye beans (cowpeas), alfalfa, ladino clover, sudan grasses, vetch, and corn and alfalfa hay.
	3. Four classes will be judged, each class consisting of four (4) samples of appropriate size. The seed samples will be in open pans with appropriate name supplied. One of these five classes shall be alfalfa hay
	4. Placings will be submitted on cards supplied to the contestant. Reasons will be given orally without the use of notes. (Notes may be used in preparation of the reasons).
	5. It should be kept in mind that only a few important reasons need be mentioned for placing one sample over another. In no case will more than four (4) reasons for any one sample be considered by the judges, and these in order of their importance.
	6. Participants will determine factors and conditions that will determine the grade of various crops. Grain grading will be done in accordance with the Official U.S. Standards for Grain. Information on grain grading can be found in the Laws and Regulations section of [www.gipsa.usda.gov](http://www.gipsa.usda.gov). One sample will be graded in 30 minutes. The sample is worth 50 points. Participants will be provided information about grain samples (e.g. test weight, moisture, and special conditions). Participants will be given representative samples in a sealed package of defected seed. Raw weights of each defect will be given and participants calculate the percentage of each based on the flow chart provided. Participants will complete the Grain Grading Answer Sheet. Participants will determine market price based on provided discount schedule. Wheat and Corn will be the only grains used for grading.
5. Alfalfa Hay Judging:
	1. Judging alfalfa hay is an 'art' which has considerable practical significance, since millions of dollars of hay sales per year are determined partly by subjective hay judging. Samples for dairy applications should be judged on the basis of their 'potential feeding value,' not on cosmetic or other factors. Samples will consist primarily of alfalfa and in student contests, typically four hay samples are judged. The 'potential feeding value' is a prediction as to superior vs. inferior animal performance from the different samples. Since most alfalfa hay is used in the dairy industry, judging should be based upon the feeding value for high producing dairy cows. Samples should be a minimum of a 12-15 inch thick flake from a bale, and preferable whole bales.
	2. Judging should be based approximately upon the California Alfalfa Hay Quality Designations in Table 1, which include “supreme”, "premium," "good," "fair," and "low" classifications. Hay should be examined carefully for characteristics outlined under Hay Judging Scorecard and Criteria for Judging Hay in Table 2 below. Hay samples should be rated 1-100 (100 best) using the 6 criteria in Table 2, summarizing the scores, and ranking the hay from highest to the lowest rating.
	3. Contestants and officials should handle alfalfa hay samples only with a pencil or other object, to prevent contamination or destruction for a large number of judges.
	4. Alfalfa Hay Judging Scorecard
		1. Judging alfalfa hay is a difficult task, especially when comparing hays which are in the mid-range of feeding value. In practice, subjective hay judging for feeding value should be used in combination with laboratory analysis, which primarily tests for ADF (Acid Detergent Fiber, from which TDN or Total Digestible Nutrients are calculated), and CP (Crude Protein). In most contests, you will be asked to judge feeding value without benefit of a hay analysis. In many situations, it is often useful to take a hay sample, analyze the sample for ADF, NDF, and CP, and not reveal that information until after the hay has been subjectively rated. It is instructive to see the limitations of both lab testing and visual inspection. It is a rare experienced hay judge who has not been fooled by a hay sample that appears poor in feeding value, but is actually high in protein and low in fiber. Conversely, sometimes a lab test will indicate high feeding value, when the hay has serious mold problems or other defects.
		2. Another consideration is Relative Feed Value (RFV), which helps buyer’s rate alfalfa’s potential for productivity in the livestock they are feeding. It is based on the digestibility and palpability and is mathematically correlated to Neutral Detergent Fiber (NDF), which measures the non-digestible proportion (i.e. cellulose, lignin) of the feed, which ranges between 30-50% in alfalfa hay.
		3. The California Hay Quality Designations are given below which should be used as a general guide.

Table 1. California Alfalfa Hay Quality Designations

|  |  |  |  |
| --- | --- | --- | --- |
| **Designations** | **Verbal Description**  | **ADF** | **TDN** |
| (100%dm) | (90%dm) |
| Supreme | Very early maturity, pre-bloom, soft fine stemmed, extra leafy. Factors indicative of very high nutritive content. Hay is excellent color and free of damage. | 27% or less | Over 54% |
| Premium | Prebud or prebloom stage of maturity. Low fiber with soft stems, high energy, and protein content (low ADF). Very high percentage leaves, low percent stem. Good green color, very good leaf attachment, good odor, free of grasses and weeds, no noxious weeds, well cured, no mold. | 29% or less | 54% or greater |
| Good | Prebloom to early bloom stage of maturity, low to medium fiber with soft stems, high energy and protein content. High percentage leaves, medium percent stem Good green color, fairly free of grasses and weeds, no noxious weeds, well cured | 29-32% | 52-54% |
| Fair | Mid-to late bloom stage of maturity, medium. Medium to high fiber with coarse stems and low to moderate energy and protein content. Low percentage leaves, high percent stem, fair to poor color, fair leaf attachment, low to moderate grass and weed contents, no noxious weeds, well cured. | 32-37% | 49-52% |
| Poor | Hay with a serious fault or faults, very low fiber. | >37% | <49% |

* + 1. Criteria and terminology used for judging alfalfa hay:
			1. Alfalfa hay (and other forages) should be judged according to a subjective evaluation of what the expected response in the animal might be. This should be termed "potential feeding value," since actual feeding value is highly dependent upon animal and management factors.
			2. Potential feeding value has two major components. 1. Potential Digestibility and 2. Potential intake. The total digestible energy, protein, and minerals which are contained in the forage are constrained by the amount of time that it takes for the animal to utilize those nutrients. Some forages are very high in digestible nutrients, but intake factors significantly limit the feeding value to the animal.
			3. The factors listed in Table 2 below will influence both digestibility and intake factors. Palatability factors such as texture and odor will primarily influence intake. Fiber and protein are major determinants of both digestibility and intake, but must be inferred from other factors, such as leafiness, weediness, and growth stage since few people can judge nutrient content directly.
			4. Table 2. Major factors influencing the feeding value of alfalfa hay. These factors are listed in approximate order of importance. Each factor should be weighed as to its predicted importance to animal performance, which is the true test of the value of forages.

Table 2. Hay Judging Scorecard and Criteria for Judging Hay

|  |  |  |
| --- | --- | --- |
| **Quality Factor** | **Ability to be judged by visual inspection** | **Characteristics to Consider** |
| Fiber and Protein Content | very poor | Fiber content is an essential factor to know when determining feeding value. Unfortunately, it is very difficult to judge visually. Contestants should make a subjective determination of fiber content based upon leaf stem ratio and growth stage, and coarseness of stem. |
| Growth Stage (maturity of plant at harvest) | poor | Even though it is difficult to judge plant maturity in a hay bale, contestants should examine the bales for evidence of bloom, extent of bloom, and relative maturity of the individual stems. The dominant maturity of all of the stems should be considered. |
| Leafiness | fair | Contestants should assess the alfalfa leaf component as a percentage of the total dry matter in the bale. Higher leaf percentage will almost always indicate higher feeding value, and high stem percentage indicates lower feeding value. This is often termed leaf/stem ratio. |
| Foreign Material | Excellent | The percentage of alfalfa hay which is not alfalfa will have an important influence on feeding value, especially later-maturity grasses. Efforts to identify the species of weeds should be made and differentiating noxious vs. other weeds. Keep in mind that some weeds can actually be high in feeding value.  |
| Color/Odor | Excellent | Odor can influence palatability and therefore feed intake and animal performance. Odor should be fresh and pleasant. Color might be misleading. It probably does not have much influence on feeding value, but can influence marketability or perception.  |
| Texture/ Condition/ Mold | Excellent | Texture can influence palatability or feed intake. Sometimes very coarse or prickly hay can irritate animal's mouths, affecting intake. The condition of the hay (whether baled too wet or too dry), the presence of mold, leaf diseases should all be taken into account. |

1. Plant Identification:
	1. Sixty (60) specimens will be selected from the attached identification list. Specimens may be either green plant material, dried plant material, or seed samples. As many samples as possible will be growing plants.
	2. The letter (B) next to the plant (weed) is to indicate that there are two (2) choices.
		1. Place the live or mounted plant out by itself or
		2. Place out the plant and seed together.
	3. If the species name is one with the letter (B), do not put the seed out alone. The plant may be put out alone.
	4. If the species name does not have the letter (B), the plant or the seed may be exhibited but not both together.
		1. Identification Scoring: Each item in the Identification will be awarded a total of 5 points
2. Insect Identification:
	1. 5 specimens will be identified (50 points).
3. Disorders and Diseases Identification:
	1. 5 specimens will be identified (50 points).
4. Time:
	1. Judging - placing four (4) classes of four (4) samples each, allowing twelve (12) minutes for placing each class.
	2. Reasons: Two (2) minutes shall be allowed for giving oral reasons on four (4) classes. Reasons will be given on Alfalfa Hay.
	3. Identification: Fifty (50) minutes will be allowed for:
		1. The identification of the seed and plant specimens
		2. Insects
		3. Disorders and Diseases
	4. Grain Grading: 30 minutes

Identification List for Agronomy Contest

Common names only will be used in the contest.

| **Code** | **Common Name** | **Botanical Name** |
| --- | --- | --- |
|  | **WHEAT**If a plant sample is displayed the participants must mark Wheat. |  |
| 100101 | Durum wheat White wheat | Triticum DurumTriticum aestivum |
| 102 | Hard Red wheat | Triticum aestivum |
|  |  |  |
|  | **SORGHUMS** |  |
|  | **Grain:**  |  |
| 103 | White sorghum  | Sorghum bicolor |
| 104 | Yellow sorghum  | Sorghum bicolor |
|  |    |  |
|  | **Grass Sorghum:**  |  |
| 105 | Sweet sorghum | Sorghum bicolor or S. bicolor x sudanense |
| 106 | Piper sudangrass | Sorghum sudanense |
|  |  |  |
|  | **CORN**If a plant sample is displayed the participants must mark Corn. |  |
| 107 | Dent corn  | Zea mays |
| 108 | Sweet corn | Zea mays |
| 109 | White rice popcorn | Zea mays |
| 110 | Yellow pearl popcorn | Zea mays |
|  |     |  |
| 111 | **RICE**  | Oryza sativa |
|  |  |  |
|  | **EDIBLE SEED LEGUMES** |  |
|  | **BEANS** |  |
| 112 | Blackeye beans or Cowpea  | Vigna unquiculata |
| 113 | Cranberry bean | Phaseolus vulgaris |
| 114 | Garbanzo bean | Cicer arietinum |
| 115 | Large lima bean | Phaseolus lunatus |
| 116 | Large seeded horsebean | Vicia faba |
| 117 | Mung bean | Vigna radiatae |
| 118 | Pink bean | Phaseolus vulgaris |
| 119 | Pinto bean | Phaseolus vulgaris |
| 120 | Red kidney bean | Phaseolus vulgaris |
| 121 | Small lima bean | Phaseolus lunatus |
| 122 | Small white bean | Phaseolus vulgaris |
| 123 | **OATS** | Avena sativa |
| 124 | **BARLEY** | Hordeum vulgare |
|  | **FORAGE LEGUMES**  |  |
| 125 | Alfalfa | Medicago sativa |
| 126 | Alsike clover  | Trifolium hybridum |
| 127 | Bird’s foot trefoil | Lotus corniculatus  |
| 128 | Common vetch | Vicia sativa |
| 129 | Crimson clover  | Trifolium incarnatum |
| 130 | Ladino clover  | Trifolium repens |
| 131 | Purple vetch | Vicia atropurpurea |
| 132 | Red clover | Trifolium pratense |
| 133 | Rose clover | Trifolium hirtum |
| 134 | Strawberry clover | Trifolium fragiferum |
| 135 | Subterranean clover | Trifolium subterraneum |
| 136 | White sweet clover | Melilotus alba |
|  | **FORAGE GRASSES** |  |
| 137 | Dallisgrass | Paspalum dilatatum |
| 138 | Hardinggrass | Phalaris tuberosa var. stenoptera |
| 139 | Orchardgrass | Dactylis glomerata |
| 140 | Prarie brome | Bromus catharticus |
| 141 | Tall fescue | Festuca arundinacea |
|  | **MISCELLANEOUS CROPS** |  |
| 142 | Cotton | Gossypium spp. |
| 143 | Flax  | Linum usitatissimum |
| 144 | Hog millet or Proso millet | Panicum miliaceum |
| 145 | Lentils | Lens culinaris |
| 146 | Peanuts | Arachis hypogaea |
| 147 | Rye | Secale creale |
| 148 | Safflower | Carthamus tinctorius |
| 149 | Sesame | Sesamum indicum |
| 150 | Soybean | Glycine max |
| 151 | Sunflower | Helianthus annuus |
| 152 | Triticale | Triticasecale |
|  | **GREEN MANURE CROPS** |  |
| 153 | Buckwheat | Fagopyrum esculentum |
| 154 | Field peas | Pisum sativum |
| 155 | Radish | Raphanus raphanistrum subsp. sativus |
| 156 | Small seeded horsebean | Vicia faba |
| 157 | Sour clover or Annual yellow sweet clover | Melilotus indicus |
|  | **WEEDS**If the botanical name is preceded by (B), do not put the seed out alone; however, the plant may be put out alone. If there is no (B), the plant or the seed may be exhibited but not both together. |  |
| 200 | Annual bluegrass | (B) Poa annua |
| 201 | Annual sowthistle | (B) Sonchus oleraceus |
| 202 | Black mustard  | (B) Brassica nigra |
| 203 | Black nightshade | (B) Solanum nigrum  |
| 204 | Broadleaf plantain | (B) Plantago major |
| 205 | Buckhorn plantain | (B) Plantago lanceolata |
| 206 | California burclover | (B) Medicago polymorpha |
| 207 | California poppy | (B) Eschscholzia californica  |
| 208 | Common chickweed | (B) Stellaria media |
| 209 | Common fiddleneck | (B) Amsinckia intermedia |
| 210 | Common groundsel | (B) Senecio vulgaris |
| 211 | Dandelion | (B) Taraxacum officinale |
| 212 | Hairy (or Large) crabgrass  | (B) Digitaria sanguinalis |
| 213 | Jimsonweed | (B) Datura stramonium |
| 214 | London rocket  | (B) Sisymbrium irio |
| 215 | Mayweed chamomile  | (B) Anthemis cotula |
| 216 | Nettleleaf goosefoot | (B) Chenopodium murale |
| 217 | Prickly lettuce | (B) Lactuca serriola |
| 218219 | Prostrate knotweed Prostrate pigweed | (B) Polygonum aviculare(B) Amaranthus blitoides |
| 220 | Red brome | (B) Bromus rubens |
| 221222223 | Red sorrelRedroot pigweedRedstem filaree | (B) Rumex acetosella(B) Amaranthus retroflexus(B) Erodium cicutarium |
| 224 | Shepherd's purse | (B) Capsella bursa-pastoris  |
| 225 | Turkey mullein  | (B) Croton setigerus |
| 226227 | White horehoundWhitestem filaree | (B) Marrubium vulgare(B) Erodium moschatum |
| 228229230 | Wild mustard or Charlock mustardAlkali mallowBarnyardgrass | (B) Sinapis arvensisMalvella leprosaEchinochloa crusgalli |
| 231 | Bearded sprangletop | Leptochloa fasicularis Leptochloa fusca ssp. fascicularis |
| 232 | Bermudagrass | Cynodon dactylon |
| 233 | Blessed milkthistle | Silybum marianum |
| 234 | Bristly oxtongue | Picris echioides |
| 235 | Catchweed bedstraw | Galium aparine |
| 236237238239 | Cheeseweed or Little mallowClotburCockleburCommon foxtail | Malva parvifloraXanthium spinosumXanthium strumariumHordeum murinum |
| 240 | Common lambsquarters | Chenopodium album |
| 241 | Common purslane | Portulaca oleracea |
| 242 | Common sunflower | Helianthus annuus |
| 243 | Curly dock or Sour dock  | Rumex crispus |
| 244 | Hairy fleabane | Conyza bonariensis |
| 245 | Hairy nightshade | Solanum sarrachoides |
| 246 | Henbit | Lamium aplexicaule |
| 247 | Italian ryegrass | Festuca perennis |
| 248 | Lanceleaved groundcherry | Physalis lancifolia |
| 249 | Ripgut brome | Bromus rigidus |
| 250251 | Russian thistleSoft chess | Salsola tragusBromus mollis |
| 252 | Spotted spurge | Euphorbia maculata |
| 253 | Velvetleaf | Abutilon theophrasti |
| 254 | Wild oat | Avena fatua |
| 255 | Wild radish | Raphanus raphanistrum |
| 256 | **PROHIBITED NOXIOUS WEEDS**Perennial pepperweed | Lepidium latifolium |
| 257 | Russian knapweed | Acroptilon repens |
| 258 | Silverleaf nightshade | Solanum elaeagnifolium |
|  | **RESTRICTED NOXIOUS WEEDS** |  |
| 259260 | Bull thistleCommon St. Johnswort | Cirsiui vulgareHypericum perforatum |
| 261 | Dodder | Cuscuta spp. |
| 262263 | Field bindweed Field sandbur | Convolvulus arvensisCenchrus incertus |
| 264 | Italian thistle | Carduus pycnocephalus  |
| 265 | Johnsongrass  | Sorghum halepense |
| 266 | Medusahead | Elymus caput-medusae |
| 267 | Nutsedge | Cyperus esculentus |
|  |  | Cyperus rotundus |
| 268 | Puncturevine  | Tribulus terrestris |
| 269 | Yellow starthistle | Centaurea solstitialils |

GENERAL SEED SCORECARD
(Values allotted sub-heads need not necessarily total the same as the main heads).

SMALL SEEDED LEGUMES SCORECARD (Alfalfa, Ladino Clover, etc.)

|  |  |
| --- | --- |
| Reproducible factors. |  |
|    Freedom from noxious weeds | 40 |
|    Freedom from common weeds | 20 |
|    Freedom from other crop seeds  | 5 |
|    |  |
| Non-reproducible factors. |  |
|    Freedom from damage | 10 |
|    Plumpness | 10 |
|    Luster | 10 |
|    Freedom from inert material | 5 |

Freedom from Noxious, Other Crop, and Common Weeds
Noxious, other crop, and common weed seeds in the samples will be selected from the list found in the Agronomy section of the Curricular Code.

Plumpness
Shrunken seed of an unnatural brown color due to immaturity, rain damage, insect damage and such other environmental factors that will result in low viability.

Luster
A dull lifeless appearance is apt to be due to weathering or age and is an indication of low viability. A dull, reddish tinge is an indication of extreme age.

Freedom from Inert Material
Includes chaff, stems, dirt, and small parts of broken seeds.

FOR CROPS OTHER THAN SMALL SEED LEGUMES

|  |  |
| --- | --- |
| Reproducible factors. |  |
|    Freedom from noxious weeds | 25 |
|    Freedom from common weeds | 20 |
|    Freedom from mixture of other crops  | 15 |
|    Freedom from mixture of varieties  | 10 |
| Non-reproducible factors. |  |
|    Maturity | 10 |
|    Natural color | 5 |
|    Uniformity | 5 |
|    Freedom from damage | 5 |
|    Freedom from foreign material | 5 |

NOTE:
These scorecards should not be used as a means of assigning numerical values to sample and placing them according to this value. The main use is to supplement good judgment in comparative evaluation of the various factors.

The official guide for the State Finals Agronomy Contest is: Composite list of Weeds, 1989 revised edition, Standardized Common Names, published by Weed Science Society of America.

#

## Corn Grading Score Card

FFA GRAIN INSPECTION SERVICE

|  |  |  |
| --- | --- | --- |
| NAME | STUDENT NUMBER | DATE |
|  |  |  |
| IDENTIFICATION AND LOT |  |  |
|  |  |  |
| GRADE AND KIND |  | BASE PRICE |
|  |  |  |
|  | Amounts | Discounts |
| Test Weight (lb./bu) |  |  |
| Moisture% |  |  |
| Dockage% |  |  |
| Damaged Kernels% |  |  |
| Flint Corn% |  |  |
| Flint and dent corn % |  |  |
| Heat Damaged kernels% |  |  |
| Odor |  |  |
| Waxy% |  |  |
|  |  |  |
| U.S. Sample Grade Factors |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| Special Factors |  |  |
|  |  |  |
| Total Discounts |  |  |
|  |  |  |
|  | Final Price |  |


##


## Wheat Grading Score Card

FFA GRAIN INSPECTION SERVICE

|  |  |  |
| --- | --- | --- |
| **NAME** | **STUDENT NUMBER** | **DATE** |
|  |  |  |
| IDENTIFICATION AND LOT |  |  |
|  |  |  |
| GRADE AND KIND |  | BASE PRICE |
|  |  |  |
|  | Amounts | Discounts |
| Test weight (lb./bu) |  |  |
| Moisture% |  |  |
| Dockage% |  |  |
| Heat damaged kernels% |  |  |
| Damaged kernels (total)% |  |  |
| Foreign material% |  |  |
| Shrunken or broken% |  |  |
| Total Defects% |  |  |
| Ergot% |  |  |
| Contrasting classes% |  |  |
| Wheat of other classes% |  |  |
|  Total% |  |  |
|  |  |  |
| U.S. Sample Grade Factors |  |  |
| Special Factors |  |  |
| Other |  |  |
| Total Discounts |  |  |
|  |  |  |
|  | Final Price |  |

# Grain Grading Scoring (Wheat)

FFA GRAIN INSPECTION SERVICE

|  |  |  |
| --- | --- | --- |
| **NAME** | **STUDENT NUMBER** | **DATE** |
|  |  |  |
| IDENTIFICATION AND LOT |  |  |
|  |  |  |
| GRADE AND KIND |  | BASE PRICE |
|  |  |  |
|  | Amounts (1 point ea.) | Discounts (1 point ea.) |
| Test weight (lb./bu) |  |  |
| Moisture% |  |  |
| Dockage% |  |  |
| Heat damaged kernels% |  |  |
| Damaged kernels (total)% |  |  |
| Foreign material% |  |  |
| Shrunken or broken% |  |  |
| Total Defects% |  |  |
| Ergot% |  |  |
| Contrasting classes% |  |  |
| Wheat of other classes% |  |  |
|  Total% |  |  |
|  |  |  |
| U.S. Sample Grade Factors |  |  |
| Special Factors |  |  |
| Other |  |  |
| Total Discounts |  |  |
|  |  |  |
|  | Final Price |  |

|  |  |
| --- | --- |
| Amounts (one point each) + Grade and Kind | 25 points |
| Discounts (one point each + Final Price | 25 points |
| Total | 50 points |

Since the number of factors is variable the number of points assigned to Grade and Final Price are variable. Different score cards will have a different number of factors. In the above example if items in yellow were present then Amounts=12 points and Discounts would be worth 12 points. Grade and Final Price would then be worth 13 points each.

# Grain Grading Example -- Hard Red Winter Wheat

### Sample

|  |  |
| --- | --- |
| Lot # | 2106-256 |
| Base price  | $4.50/bushel |
| Test weight:  | 58 pounds per bushel |
| Moisture %: | 13.8% |
| Dockage: | .8% |
| Heat Damage: | 0% |
| Damaged kernels: | 1.8% |
| Foreign material: | 1% |
| Shrunken or broken kernels: | 8% |
| Ergot | 0% |
| Contrasting Classes | 0% |
| Wheat of other classes | 0% |

### USDA Wheat Grades

The table below is published by the USDA. Using the sample data the grade is determined. Determining factors are shown in yellow.

|  |  |
| --- | --- |
| Grading factors | Grades U.S. Nos.  |
| 1 | 2 | 3 | 4 | 5 |
| Minimum pound limits of: |
| Test weight per bushel Hard Red Spring wheat or White Club wheat All other classes and subclasses  | 58. 0 60.0  | 57.0 58.0  | 55.0 56.0  | 53.0 54.0  | 50.0 51.0  |
| Maximum percent limits of: |
| Defects: |  |  |  |  |  |
|  Damaged kernels  |  |  |  |  |  |
|  Heat (part of total)  | 0.2  | 0.2  | 0.5  | 1.0  | 3.0  |
|  Total  | 2.0  | 4.0  | 7.0  | 10.0 | 15.0 |
|  Foreign material  | 0.4  | 0.7  | 1.3  | 3.0  | 5.0  |
|  Shrunken and broken kernels  | 3.0  | 5.0  | 8.0  | 12.0  | 20.0  |
|  Total 1/  | 3.0  | 5.0  | 8.0  | 12.0 | 20.0  |
| Wheat of other classes: 2/ |  |  |  |  |  |
|  Contrasting classes  | 1.0  | 2.0  | 3.0  |  10.0  | 10.0  |
|  Total 3/  | 3.0  | 5.0  | 10.0  |  10.0  | 10.0 |
|  Stones  | 0.1  | 0.1  | 0.1 | 0.1  | 0.1  |
| Maximum count limits of: |
| Other material in one kilogram: |  |  |  |  |  |
|  Animal filth | 1  | 1  | 1  | 1  | 1  |
|  Castor beans | 1  | 1  | 1  | 1  | 1  |
|  Crotalaria seeds  | 2  | 2  | 2  | 2  | 2  |
|  Glass | 0  | 0  | 0  | 0  | 0  |
|  Stones  | 3  | 3  | 3  | 3  | 3  |
|  Unknown foreign substances  | 3  | 3  | 3  | 3  | 3  |
|  Total 4/  | 4  | 4  | 4  | 4  | 4  |
|  Insect-damaged kernels in 100 grams  | 31  | 31  | 31  | 31  | 31  |
| U.S. Sample grade is Wheat that:(a) Does not meet the requirements for U.S. Nos. 1, 2, 3, 4, or 5; or (b) Has a musty, sour, or commercially objectionable foreign odor (except smut or garlic odor) or(c) Is heating or of distinctly low quality.\_\_\_\_\_\_\_\_\_ 1/ Includes damaged kernels (total), foreign material, shrunken and broken kernels. 2/ Unclassed wheat of any grade may contain not more than 10.0 percent of wheat of other classes. 3/ Includes contrasting classes. 4/ Includes any combination of animal filth, castor beans, crotalaria seeds, glass, stones, or unknown foreign substance.  |

### Wheat Grain Grading Discount Schedule

The discount schedule is used to determine deductions from the base price (given) based on the sample.

**Test Weight (TW) or Bushel Weight:**

60 pounds per bushel is the minimum

2 cents per pound discount for every pound under 60 pounds/bushel weight

|  |  |
| --- | --- |
| **Defect** | **Discount/Bu** |
| **Moisture %** |  |
| Less than 13.5% | 0 cents |
| 13.5 to 14.0%  | 3 cents |
| 14.1 to 14.5  | 6 cents |
| 3 cents per bushel per .5% over moisture |
| **Dockage** |  |
| 0 to .2%  | 0 cents |
| .3 to .7%  | 3 cents |
| .8 to 1.2%  | 6 cents |
| **Heat Damage** |  |
| Less than .3%  | 0 cents |
| .3 to .5% -  | 10 cents |
| **Damaged Kernels** |  |
| Less than .5% | 0 cents |
| .5% -  | 3 cents |
| .6 - 1.0% | 6 cents  |
| 1.1 - 1.5% | 9 cents  |
| 1.6 - 2% | 12 cents  |
| **Foreign Material** |  |
| Less than .5% | 0 cents |
| .5 to .9%  | 3 cents |
| 1 to 1.4% | 6 cents  |
| 1.5 to 1.9%  | 9 cents  |
| **Defect** | **Discount/Bu** |

|  |  |
| --- | --- |
| **Shrunken or Broken %** |  |
| Less than 4% | 0 cents |
| 4-5% | 2 cents  |
| 6-7% | 4 cents  |
| 7-8%  | 6 cents |
| **Ergot** |  |
| 0-.05% | 0 cents |
| Above .05% | 15 cents |
| **Contrasting Classes** |  |
| 0-1% | 0 cents |
| 1.1%-2% | 5 cents  |
| 2.1%-3% | 10 cents  |
| 3.1-10%  | 15 cents |
| Discount is 5 cents per bushel per grade |
| **Wheat of other Classes** |  |
| Only take this discount if not taking a discount from contrasting classes of wheat |
| 0- 3% | 0 cents |
| 3.1%-5% | 3 cents |
| 5.1-10% | 6 cents |
| Discount is 3 cents per bushel per grade |

For example:  58 pound test weight will be a 4 cent discount

### Wheat Discount Schedule 2019-2022


### WHEAT GRADING SCORE CARD KEY

FFA GRAIN INSPECTION SERVICE

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name |  | Contestant # |  | Date |
| KEY |  |  |  | 2/4/2017 |
| IDENTIFICATION AND LOT |  |  |  |  |
|  |  |  |  |  |
| GRADE AND KIND |  |  |  | BASE PRICE |
| US #4, Hard Red Winter Wheat |  | $4.50 |
|  |  | Amounts |  | Discounts |
| Test weight (lb./bu) |  | 58 lb. |  | .04 |
| Moisture% |  | 13.8 % |  | .03 |
| Dockage% |  | .8 % |  | .06 |
| Heat damaged kernels% |  | 0 % |  | 0 |
| Damaged kernels (total)% |  | 1.8 % |  | .12 |
| Foreign material% |  | 1 % |  | .06 |
| Shrunken or broken% |  | 8 % |  | .06 |
| Total Defects% |  | 10.8% |  |  |
| Ergot% |  | 0% |  | 0 |
| Contrasting classes% |  | 0% |  | 0 |
| Wheat of other classes% |  | 0% |  | 0 |
|  Total% |  | 0% |  |  |
|  |  |  |  |  |
| U.S. Sample Grade Factors |  |  |  |  |
| Special Factors |  |  |  |  |
| Other |  |  |  |  |
| Total Discounts |  |  |  | 0.37 |
|  |  | **Final Price** |  | $4.13 |

Scoring: Grade=25-12=13, Final Price=25-12=13, all other entries 1 point each.

### WHEAT GRADING SCORE CARD EXAMPLE

FFA GRAIN INSPECTION SERVICE

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name |  | Contestant # |  | Date |
| Mary Smith |  | 24 |  | 2/4/2017 |
| IDENTIFICATION AND LOT |  |  |  |  |
|  |  |  |  |  |
| GRADE AND KIND |  |  |  | BASE PRICE |
| US #4, Hard Red Winter Wheat |  | $4.50 |
|  |  | Amounts |  | Discounts |
| Test weight (lb./bu) |  | 58 lb. |  | .04 |
| Moisture% |  | 13.8 % |  | .03 |
| Dockage% |  | .8 % |  | 0 |
| Heat damaged kernels% |  | 0 % |  | 0 |
| Damaged kernels (total)% |  | 1.8 % |  | .12 |
| Foreign material% |  | 1 % |  | .06 |
| Shrunken or broken% |  | 8 % |  | .06 |
| Total Defects% |  | 10.8% |  |  |
| Ergot% |  | 0% |  | 0 |
| Contrasting classes% |  |  |  |  |
| Wheat of other classes% |  |  |  |  |
|  Total% |  |  |  |  |
|  |  |  |  |  |
| U.S. Sample Grade Factors |  |  |  |  |
| Special Factors |  |  |  |  |
| Other |  |  |  |  |
| Total Discounts |  |  |  | 0.37 |
|  |  | **Final Price** |  | $4.13 |

Score:25-3+25-17=30. Incorrect or missing entries minus 1 point each (shown in yellow). Final Price -13 points.

## INSECT INDENTIFICATION (50 points)

Five samples will be identified according to insect name, life cycle, economic impact, and mouthpart.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Scorecard** | ***Member Answer*** | ***Possible******Points*** | ***Member score*** | ***Possible Answers******Name*** |
| 1. ID # |  | 4 |  | 11 Alfalfa weevil |
| Economic Impact# |  | 2 |  | 12 Aphids |
| Life Cycle # |  | 2 |  | 13 Armyworm larva |
| Mouth part # |  | 2 |  | 14 Assassin bug |
| 2. ID # |  | 4 |  | 15 Bean leaf beetle |
| Economic Impact# |  | 2 |  | 16 Blister beetle (Larva) |
| Life Cycle # |  | 2 |  | 17 Blister beetle (Adult) |
| Mouth part # |  | 2 |  | 18 Boll weevil |
| 3. ID # |  | 4 |  | 19 Chinch bug |
| Economic Impact# |  | 2 |  | 20 Colorado potato beetle |
| Life Cycle # |  | 2 |  | 21 Corn ear worm larva |
| Mouth part # |  | 2 |  | 22 Corn rootworm larva |
| 4. ID # |  | 4 |  | 23 Cricket |
| Economic Impact# |  | 2 |  | 24 Cutworm larva |
| Life Cycle # |  | 2 |  | 25 European corn boer larva |
| Mouth part # |  | 2 |  | 26 Flea beetle |
| 5. ID # |  | 4 |  | 27 Grain weevil |
| Economic Impact# |  | 2 |  | 28 Grasshopper |
| Life Cycle # |  | 2 |  | 29 Green lacewing |
| Mouth part # |  | 2 |  | 30 Honeybee |
|

|  |
| --- |
| ***Economic Impact*** |
| 1 None or predatory |
| 2 Fruit/Flower destruction |
| 3 Vegetative destruction |
| 4 Removal of plant fluids |
|  |
| ***Life Cycle*** |
| C Complete |
| I Incomplete |
| N None |
|  |
| ***Mouth Parts***  |
| 1 Chewing |
| 2 Chewing-lapping |
| 3 Rasping-sucking |
| 4 Piercing-sucking |
| 5 Sponging |
| 6 Siphoning |

 |  |  | 31 Japenese beetle32 Lady beetle larva33 Leaf skeletonizer34 Leafhopper35 Lygus36 Mexican bean beetle37 Pink bollworm larva38 Salt marsh caterpillar39 Scale40 Spider mite41 Spittlebug42 Spotted cucumber beetle43 Stink bug44 Tobacco/tomato hornworm larva45 Western corn rootworm beetle46 Western flower thrip47 White grub48 Whitefly49 Wireworm |
| Total Score: |  | 50 |  |  |
|  |  |  |  |  |
|  |

Insect List

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Insect** | **Economic Impact** | **Life Cycle** | **Mouth Parts** |
| 11. | Alfalfa weevil | Vegetative Part Destruction  | Complete  | Chewing |
| 12. | Aphids | Removal of Plant Fluids | Incomplete | Piercing-Sucking  |
| 13. | Armyworm larva | Vegetative Part Destruction  | Complete | Chewing |
| 14. | Assassin bug | None or Predatory  | Incomplete | Piercing-Sucking  |
| 15. | Bean leaf beetle | Fruit/Flower Destruction & Vegetative Part Destruction | Complete | Chewing |
|  |  |  |  |  |
| 16. | Blister beetle (larvae) | None or Predatory  | Complete | Chewing |
| 17. | Blister beetle (adult) | Vegetative Part Destruction  | Complete | Chewing |
| 18. | Boll weevil | Fruit/Flower Destruction | Complete | Chewing |
| 19. | Chinch bug | Removal of Plant Fluids  | Incomplete | Piercing-Sucking  |
| 20. | Colorado potato beetle | Vegetative Part Destruction  | Complete | Chewing |
| 21. | Corn earworm larva | Fruit/Flower Destruction & Vegetative Part Destruction | Complete | Chewing |
| 22. | Corn rootworm larva | Vegetative Part Destruction  | Complete | Chewing |
| 23. | Cricket | Fruit/Flower Destruction  | Incomplete | Chewing |
| 24. | Cutworm larva | Vegetative Part Destruction  | Complete | Chewing |
| 25. | European corn borer larva | Fruit/Flower Destruction & Vegetative Part Destruction | Complete | Chewing |
| 26. | Flea beetle | Vegetative Part Destruction  | Complete | Chewing |
| 27. | Grain weevil | Fruit/Flower Destruction  | Complete | Chewing |
| 28. | Grasshopper | Vegetative Part Destruction  | Incomplete | Chewing |
| 29. | Green lacewing | None or Predatory  | Complete | Chewing |
| 30. | Honeybee |  None or Predatory  | Complete | Chewing-Lapping  |
| 31. | Japanese beetle | Fruit/Flower Destruction & Vegetative Part Destruction | Complete | Chewing |
| 32. | Lady beetle larva |  None or Predatory  | Complete | Chewing |
| 33. | Leaf skeletonizer | Vegetative Part Destruction  | Complete | Chewing |
| 34. | Leafhopper | Removal of Plant Fluids  | Incomplete | Piercing-Sucking  |
| 35. | Lygus | Fruit/Flower Destruction & Vegetative Part Destruction | Incomplete | Piercing-Sucking  |
| 36. | Mexican bean beetle | Fruit/Flower Destruction & Vegetative Part Destruction | Complete | Chewing |
| 37. | Pink bollworm larva | Fruit/Flower Destruction  | Complete | Chewing |
| 38. | Salt marsh caterpillar/wooly worm | Vegetative Part Destruction  | Complete | Chewing |
| 39. | Scale | Removal of Plant Fluids  | Incomplete | Piercing-Sucking  |
| 40. | Spider mite | Vegetative Part Destruction  | Incomplete | Rasping-Sucking  |
| 41. | Spittlebug | Removal of Plant Fluids  | Incomplete | Piercing-Sucking  |
| 42. | Spotted cucumber/Southern corn rootworm beetle | Fruit/Flower Destruction & Vegetative Part Destruction | Complete | Chewing |
| 43. | Stinkbug | Removal of Plant Fluids | Incomplete | Piercing-Sucking  |
| 44. | Tobacco/tomato hornworm larva | Fruit/Flower Destruction & Vegetative Part Destruction | Complete | Chewing |
| 45. | Western corn rootworm beetle | Fruit/Flower Destruction & Vegetative Part Destruction | Complete | Chewing |
| 46. | Western flower thrip | Fruit/Flower Destruction & Vegetative Part Destruction | Incomplete | Rasping-Sucking  |
| 47. | White grub | Vegetative Part Destruction  | Complete | Chewing |
| 48. | Whitefly | Vegetative Part Destruction & Removal of Plant Fluid | Complete | Piercing-Sucking  |
| 49. | Wireworm | Vegetative Part Destruction  | Complete | Chewing |

Disorders and Diseases

Five samples will be identified according to category, causal agent, and damage location.

**Scorecard**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ***Member Answer*** | ***Possible******Points*** | ***Member score*** | ***Possible Answer*** |
| 1. Causal Cat. # |  | 3 |  | ***Causal Category*** |
| Agent# |  | 4 |  | C Cultural |
| Plant Part Damaged # |  | 3 |  | B BiologicalE Environmental |
| 2. Causal Cat. # |  | 3 |  |  |
| Agent# |  | 4 |  | ***Agents*** |
| Plant Part Damaged # |  | 3 |  | 10 Fungus |
|  |  |  |  | 11 Chemical |
| 3. Causal Cat. # |  | 3 |  | 12 Mechanical |
| Agent# |  | 4 |  | 13 Compaction |
| Plant Part Damaged # |  | 3 |  | 14 Nematodes |
|  |  |  |  | 15 Bacteria |
| 4. Causal Cat. # |  | 3 |  | 16 Insect |
| Agent# |  | 4 |  | 17 Nutritional  |
| Plant Part Damaged # |  | 3 |  | 18 Drought |
|  |  |  |  | 19 Pollution |
| 5. Causal Cat. # |  | 3 |  | 20 Flood |
| Agent# |  | 4 |  | 21 Heat |
| Plant Part Damaged # |  | 3 |  | 22 Virus |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  | ***Parts of Plant Damaged*** |
|  |  |  |  | 1 No Damage |
|  |  |  |  | 2 Fruit or Flower  |
|  |  |  |  | 3 Vegetative Parts |
|  |  |  |  | 4 Vascular Bundles |
|  |  |  |  | 5 More than one area |
|  |  |  |  |  |
| **Total Score:** |  | 50 |  |  |