



## 2013 Collegiate Weed Contest North Central Weed Science Society

The purpose of the NCWSS Collegiate Weed Science Contest is to provide an educational experience for college students interested on Weed Science. The meeting offers networking opportunities with university faculty, researchers, industry representatives, and fellow students. Students can apply and expand their weed science knowledge in a practical setting. Participating in this contest will provide you with a valuable experience and recognition for your future career endeavors. Finally this contest aims at increasing the visibility on the current and future importance of Weed Science for the agricultural business. This contest will be conducted by NCWSS and Northeastern Weed Science Society is invited to participate in the contest.

### ***CONTEST RULES***

#### **A. Eligibility**

Any undergraduate or graduate student currently enrolled and pursuing an A.S., B.Sc., M.Sc. or Ph.D. is eligible to participate. Eligibility includes A.S. students, including 2-year schools, who will compete as undergraduate individuals and teams. ***Each team will consist of three or four members. If a team has four students, the top three scores will be used to calculate a team score. If a team has three students, all three scores will be used to calculate the team score.*** A team may be composed of: (a) graduates, (b) undergraduates, or (c) combination (graduates and undergraduates). A combination team must compete as a graduate team; however, the undergraduate students remain eligible for individual undergraduate awards. There is no restriction on the number of teams a college or university may enter in the contest. If a college or university does not have sufficient students for a team of three, students may enter as individuals.

All students graduating with an A.S. or B.Sc. degree six months before the contest (and not actively enrolled in a graduate program) will be able to participate as an undergraduate.

#### **B. Awards**

Plaques will be awarded for the following categories for both NCWSS and NEWSS

Team – The highest team score from all events (weed identification, written test and team sprayer calibration, unknown herbicides, and problem solving) will determine the overall contest winner in both the graduate and undergraduate divisions. Second and third place teams will also

be recognized. In addition, the graduate and undergraduate teams scoring highest in the team sprayer calibration event will also receive a plaque.

Individual – The highest three combined scores from all events (weed identification, written calibration test, unknown herbicides, and problem solving) will determine the overall top three graduate and top three undergraduate individual winners. Each will be recognized by a plaque. The highest individual scores by a graduate and an undergraduate student for each contest event: Weed Identification, Problem Solving, unknown herbicides, and written calibration test, will be recognized with a plaque.

Apart from these awards, there will be an award for overall Grand Champion Graduate team and Overall Grand Champion Undergraduate team

| Awards                                       |         | Total Plaques |               |
|--|---------|---------------|---------------|
| Overall Graduate Champion Graduate Team      |         | 1             |               |
| Overall Graduate Champion Undergraduate Team |         | 1             |               |
|  | Placing | NCWSS Plaques | NEWSS Plaques |
| Graduate Team                                | First   | 1             | 1             |
|  | Second  | 1             | 1             |
|  | Third   | 1             | 1             |
| Undergraduate Team                           | First   | 1             | 1             |
|  | Second  | 1             | 1             |
|  | Third   | 1             | 1             |
| Field Calibration Graduate Team              | First   | 1             | 1             |
| Field Calibration Undergraduate Team         | First   | 1             | 1             |
| Graduate Individual                          | First   | 1             | 1             |
|  | Second  | 1             | 1             |
|  | Third   | 1             | 1             |
| Undergraduate Individual                     | First   | 1             | 1             |
|  | Second  | 1             | 1             |
|  | Third   | 1             | 1             |
| Graduate Individual Weed Id                  | First   | 1             | 1             |
| Graduate Individual Herbicide Id             | First   | 1             | 1             |
| Graduate Individual Problem Solving          | First   | 1             | 1             |
| Graduate Individual Written Calibration      | First   | 1             | 1             |
| Undergraduate Individual Weed Id             | First   | 1             | 1             |
| Undergraduate Individual Herbicide Id        | First   | 1             | 1             |
| Undergraduate Individual Problem Solving     | First   | 1             | 1             |
| Undergraduate Individual Written Calibration | First   | 1             | 1             |

### C. Events

The contest will consist of four major events.

#### 1) WEED IDENTIFICATION

Plants will be grown in either a field nursery or greenhouse pots and may be in any stage of growth or development, including seed samples. A complete list of potential species will be sent to each university and will be posted on the NEWSS and NCWSS weed contest websites. From this list, 25 weeds will be presented in identifiable condition for the contest. Weeds may be presented in any stage of growth or development (seeds, seedlings, mature weeds or plant parts).

Students must also be able to identify weed seed from the species on the list. Each contestant will identify 25 mature weeds, weed seedlings, or weed seeds for a ***total of 100 points per person and 300 points for the team as only top three scores from 4 person teams will be counted towards team score.*** Each item is worth four points. Points are given as follows: two points for the common name and its correct spelling and two points for the scientific name and its correct spelling (including underlining the scientific name). The maximum deduction is four points per sample. Five additional species will be identified to break any ties. Common names, scientific names, and spellings must conform to the most current "Composite List of Weeds" published by Weed Science, revised 1989, unless specific exceptions are announced prior to the contest.

## 2) APPLICATION TECHNOLOGY

A. Written Test on Sprayer Calibration - Questions will cover all aspects of sprayer calibration, such as volume of spray needed, amount of herbicide needed per gallon or liter, nozzle nomenclature and selection, sprayer pressure, droplet size, boom height, drift reduction techniques, etc. The test will be comprised of multiple choice, short answer, and written calculation questions. The major reference will be the TeeJet Agricultural Spray Products Catalog from Spraying Systems Company, but other sources may be used. Test information will be provided in both English and metric units. Correct answers will be accepted in both English and metric units. A 30-minute time limit will be imposed for the written test. This will be the first event of the contest. All participants will take the test during this time period. ***The written portion is scored as an individual event worth 50 points per person and 150 points for the team.***

B. Sprayer Calibration - Each team will calibrate a CO<sub>2</sub> backpack sprayer based on a basic written problem that will be calculated during this session. The team portion will not be used in calculating individual scores, but will be used to calculate team scores. Each team will be given a set of conditions upon which a CO<sub>2</sub> backpack sprayer is to be calibrated based upon the application of a herbicide mixture. This event is worth 200 points. All sprayer components, calculators, and stopwatches will be provided. Use of personal calculators will not be permitted. Each team will be expected to choose the appropriate nozzle tips, speed, pressure, and amount of herbicide for accurate calibration and application. Each team will be asked to deliver a designated number of gallons/acre or liters/hectare over a given length or area. Scoring will be based on accuracy of elapsed time, application and calibration. A CO<sub>2</sub> backpack sprayer will be provided for this timed event. Time will start when the team approaches the spray table. For every twelve seconds over the ten-minute allotment, one point will be deducted from a possible 50 points. The correct amount of herbicide/gallon or liter of spray solution must be given to the judge before the calibration run (25 points). When a team is ready to make the calibration run, advise the judge and the time will be stopped. The calibration run is then made with the judge watching the proper boom height and uniformity of spray pattern. The calibration run is scored 15 points for boom height, 40 points for nozzle selection, 30 points for screen selection, and 16 points for uniform spray pattern for a total of 101 points.

Points for correct nozzle selection will be as follows: 5 points/nozzle plus 20 additional points awarded if all four nozzles are correct; no additional points awarded if any of the four nozzles are incorrect. Similarly, points for correct screen/check valve selection will be as follows: 5 points/screen plus 10 additional points awarded if all four screens are correct; no additional points if any of the four screens are incorrect. The judge will then check each nozzle for output

in milliliters per minute. A  $\pm 3\%$  variation per nozzle will be allowed. Each 0.5% under or over the 3% will result in loss of 0.5 points. For example, if a nozzle is producing 8% less than the calculated (correct) output, 5 points will be deducted. The sprayer output will count for 24 points.

(Point breakdown)

Calibration Run:

25 points = correct sprayer output given to judge

15 points = boom height

40 points = nozzle selection (5/nozzle + 20 for all same nozzle)

30 points = screen/check valve selection (5/screen + 10 for all same screen)

16 points = uniform spray pattern

24 points = sprayer output (0.5 pt / each 0.5% beyond  $\pm 3\%$ )

50 points = Time

Total = 200 points

### 3) IDENTIFICATION OF UNKNOWN HERBICIDES

Crop and weed species will be planted and treated with herbicides. A list of crops, weeds and herbicides will be provided prior to the contest. From this list, selections will be made. Students will be required to identify herbicides by visual symptoms on crops and weeds. ***This event is worth 100 points for individuals and 300 points for the team.*** There is a change in this section this year. ***Graduate students will have to identify the herbicides by common name, herbicide family, and site of action. Undergraduate students will identify herbicides by site of action and common name will be a tie breaker. They will have to write both site of action and common name, but will be scored only for correct site of action; correct common name will be used only for tie breaker.*** There will be ten plots and each plot will be worth 10 points (5 points for correct common name, 3 points for correct herbicide family, and 2 points for correct site of action). Five additional plots will be identified to break any ties. There can also be a control plot, which must be identified as a control. Herbicide plots may be duplicated.

### 4) PROBLEM SOLVING AND RECOMMENDATION

Students will be required to evaluate a crop production problem in a field situation and recommend an effective solution to that problem. Recommendations must comply with accepted agricultural practices. Students should consider all factors which influence crop growth and development. Although several possible answers may be correct, the best answer considering all alternatives will be determined by a designated advisory panel. This event is to be presented and handled in a "role-playing" situation. The student will be asked to assume the role of an extension, sales, or research person when dealing with the farmer.

25 points - How the student approached the farmer.

45 points - Assessment of situation; determine the problem.

15 points - Recommendation - now

15 points - Recommendation - next year

***Each student will handle only one situation, for a total possible score of 100 points and 300 points for the team.*** Students will be selected by chance for each possible situation. Each team member will evaluate a different situation. Winners of each situation may be required to participate in a common, but different field situation to determine the overall winner.

## 2013 North Central Collegiate Weed Contest

### Weed Identification List

1. *Abutilon theophrasti* velvetleaf
2. *Acalypha orstryifolia* hophornbeam copperleaf
3. *Aegilops cylindrica* jointed goatgrass
4. *Amaranthus blitoides* prostrate pigweed
5. *Amaranthus palmeri* Palmer amaranth
6. *Amaranthus retroflexus* redroot pigweed
7. *Amaranthus rudis* common waterhemp
8. *Ambrosia artemisiifolia* common ragweed
9. *Ambrosia trifida* giant ragweed
10. *Apocynum cannabinum* hemp dogbane
11. *Asclepias syriaca* common milkweed
12. *Avena fatua* wild oat
13. *Barbarea vulgaris* yellow rocket
14. *Bromus japonicus* Japanese brome
15. *Bromus secalinus* cheat
16. *Bromus tectorum* downy brome
17. *Capsella bursa-pastoris* shepherd's-purse
18. *Carduus nutans* musk thistle
19. *Cenchrus longispinus* longspine sandbur
20. *Chenopodium album* common lambsquarters
21. *Cirsium vulgare* bull thistle
22. *Conium maculatum* poison hemlock
23. *Convolvulus arvensis* field bindweed
24. *Conyza canadensis* horseweed
25. *Cyperus esculentus* yellow nutsedge
26. *Datura stramonium* jimsonweed
27. *Descurainia sophia* flixweed
28. *Digitaria sanguinalis* large crabgrass
29. *Echinochloa crus-galli* barnyardgrass
30. *Elymus canadensis* Canada wildrye
31. *Elymus repens* quackgrass
32. *Equisetum arvense* field horsetail
33. *Eriochloa villosa* woolly cupgrass
34. *Galinsoga ciliata* hairy galinsoga
35. *Helianthus annuus* common sunflower

|                                     |                          |
|-------------------------------------|--------------------------|
| 36. <i>Ipomoea hederacea</i>        | ivy leaf morningglory    |
| 37. <i>Ipomoea lacunosa</i>         | pitted morningglory      |
| 38. <i>Ipomoea purpurea</i>         | tall morningglory        |
| 39. <i>Kochia scoparia</i>          | kochia                   |
| 40. <i>Lactuca serriola</i>         | prickly lettuce          |
| 41. <i>Lamium amplexicaule</i>      | henbit                   |
| 42. <i>Malva neglecta</i>           | common mallow            |
| 43. <i>Oenothera albicaulis</i>     | prairie evening-primrose |
| 44. <i>Panicum dichotomiflorum</i>  | fall panicum             |
| 45. <i>Phytolacca americana</i>     | common pokeweed          |
| 46. <i>Plantago lanceolata</i>      | buckhorn plantain        |
| 47. <i>Polygonum convolvulus</i>    | wild buckwheat           |
| 48. <i>Polygonum pennsylvanicum</i> | Pennsylvania smartweed   |
| 49. <i>Poa annua</i>                | annual bluegrass         |
| 50. <i>Polygonum aviculare</i>      | prostrate knotweed       |
| 51. <i>Portulaca oleracea</i>       | common purslane          |
| 52. <i>Proboscidea louisianica</i>  | devil's claw             |
| 53. <i>Rumex crispus</i>            | curly dock               |
| 54. <i>Salsola tragus</i>           | Russian thistle          |
| 55. <i>Setaria faberi</i>           | giant foxtail            |
| 56. <i>Setaria pumila</i>           | yellow foxtail           |
| 57. <i>Setaria verticillata</i>     | bristly foxtail          |
| 58. <i>Setaria viridis</i>          | green foxtail            |
| 59. <i>Sinapis arvensis</i>         | wild mustard             |
| 60. <i>Solanum nigrum</i>           | black nightshade         |
| 61. <i>Solanum ptycanthum</i>       | eastern black nightshade |
| 62. <i>Solanum rostratum</i>        | buffalobur               |
| 63. <i>Sorghum bicolor</i>          | shattercane              |
| 64. <i>Sorghum halepense</i>        | johnsongrass             |
| 65. <i>Stellaria media</i>          | common chickweed         |
| 66. <i>Taraxacum officinale</i>     | dandelion                |
| 67. <i>Thlaspi arvense</i>          | field pennycress         |
| 68. <i>Tribulus terrestris</i>      | puncturevine             |
| 69. <i>Typha latifolia</i>          | common cattail           |
| 70. <i>Urochloa platyphylla</i>     | broadleaf signalgrass    |
| 71. <i>Xanthium strumarium</i>      | common cocklebur         |

### 2013 North Central Collegiate Weed Contest Unknown Herbicide List

| Common Name            | Trade Name             | Herbicide Family        | Site of Action                  | Timing | Rate     |
|------------------------|------------------------|-------------------------|---------------------------------|--------|----------|
| 1. 2,4-D               | 2,4-D                  | Phenoxy                 | Plant Growth Regulator          | POST*  | 0.5 lb   |
| 2. atrazine            | AAtrex, Atrazine       | Triazine                | Photosystem II Inhibitor        | PRE    | 1.6 lb   |
| 3. acetochlor          | Warrant                | Chloroacetamide         | Long Chain Fatty Acid Inhibitor | PRE    | 1.12 lb  |
| 4. bromoxynil          | Buctril                | Benzonitrile            | Photosystem II Inhibitors       | POST   | 0.25 lb  |
| 5. carfentrazone-ethyl | Aim                    | Aryl Triazinone         | PPO Inhibitor                   | POST   | 0.011 lb |
| 6. chlorimuron-ethyl   | Classic                | Sulfonylurea            | ALS Inhibitor                   | POST   | 0.008 lb |
| 7. clethodim           | Select, Select Max     | Cyclohexanedione        | ACCase Inhibitors               | POST   | 0.1 lb   |
| 8. clopyralid          | Stinger                | Pyridinecarboxylic Acid | Plant Growth Regulator          | POST   | 0.185 lb |
| 9. dicamba             | Clarity                | Benzoic Acid            | Plant Growth Regulator          | POST   | 0.5 lb   |
| 10. diuron             | Karmex, Direx          | Phenylurea              | Photosystem II Inhibitor        | PRE    | 0.8 lb   |
| 11. flumioxazin        | Chateau/Valor          | N-phenylphthalimide     | PPO Inhibitor                   | PRE    | 0.13 lb  |
| 12. fomesafen          | Flexstar , Reflex      | Diphenylether           | PPO Inhibitor                   | POST   | 0.25 lb  |
| 13. glufosinate        | Ignite/Libery          | Unknown                 | Glutamine Synthetase Inhibitor  | POST   | 0.6 lb   |
| 14. glyphosate         | Roundup WeatherMax     | Unknown                 | EPSP Synthase Inhibitor         | POST   | 1.0 lb   |
| 15. halosulfuron       | Permit                 | Sulfonylurea            | ALS Inhibitor                   | POST   | 0.031 lb |
| 16. imazethypyr        | Pursuit DG             | Imidazolinone           | ALS Inhibitor                   | POST   | 0.63 lb  |
| 17. isoxaflutole       | Balance flex           | Isoxazole               | HPPD Inhibitor                  | PRE    | 0.05 lb  |
| 18. mesotrione         | Callisto               | Triketone               | HPPD Inhibitor                  | POST   | 0.094 lb |
| 19. metribuzin         | Sencor                 | Triazinone              | Photosystem II Inhibitor        | PRE    | 0.38 lb  |
| 20. nicosulfuron       | Accent                 | Sulfonylurea            | ALS Inhibitor                   | POST   | 0.031 lb |
| 21. paraquat           | Gramoxone Inteon       | Bipyridilium            | Photosystem I inhibitor         | POST   | 0.5 lb   |
| 22. pendimethalin      | Prowl H <sub>2</sub> O | Dinitroaniline          | Mitosis Inhibitor               | PRE    | 1.14 lb  |
| 23. pyroxasulfone      | Zidua                  | Pyrazole                | Long Chain Fatty Acid Inhibitor | PRE    | 0.156 lb |
| 24. sulfentrazone      | Spartan                | Aryl Triazinone         | PPO Inhibitor                   | PRE    | 0.14 lb  |
| 25. tembotrione        | Laudis                 | Triketone               | HPPD Inhibitor                  | POST   | 0.082 lb |

\*Appropriate adjuvants will be added to POST applied herbicides

## Crop/Weed List for the Unknown Herbicide Event

### CROPS

1. Alfalfa
2. Canola
3. Corn, field
4. Corn, silage
5. Grain sorghum
6. Pea, field/Snap beans
7. Pumpkins
8. Soybean
9. Sunflower
10. Sugarbeet
11. Wheat

### WEEDS

12. barnyardgrass
13. common cocklebur
14. common lambsquarters
15. crabgrass, large
16. foxtail, yellow
17. kochia
18. *Ipomoea* spp.
19. *Amaranthus* spp.
20. shattercane
21. velvetleaf
22. Yellow nutsedge