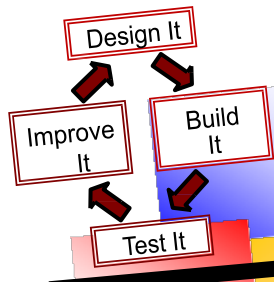


## NATIONAL YOUTH ENGINEERING CHALLENGE



# Lawn Tractor Challenge

September 24-26, 2017

Tippecanoe County Fairgrounds, Lafayette, IN

This event is designed to give youth participating in the Lawn Tractor-focused educational programs an opportunity to demonstrate their knowledge and skills in the areas of lawn care, business management, and lawn and garden tractor operation, maintenance and safety, while competing with other youth. Safety is stressed throughout this contest.

This contest will include (time limits as shown):

1. Written examination (20 minutes)
  2. Parts/Materials Identification (15 minutes)
  3. Lawn Tractor Safety
  4. Lawn Tractor Driving
- } (8 minutes simultaneously)

Designated judges will preside over the event and their decisions will be final.

### Participant Limitation

The participant will be physically large enough to operate the tractor without help from others or bypassing the tractor safety interlock systems.

### Tractor Operation

The driving portion gives youth participating in this contest an opportunity to demonstrate their skill in operation of small tractors. Safety in work habits and equipment operation is stressed throughout the event. The participant will operate a lawn and garden tractor through the prescribed course.

### Scoring

Penalty points will be assessed for errors in written examination, parts identification, safety, and poor operation. The individual with the lowest total score will be declared the winner.

### Practice Period

Each participant will be given limited time (not more than 4 minutes) to study and get acquainted with the machine and its controls. The tractor may be operated in the immediate area of the contest during the familiarization but not through the course.

It is the policy of the Cooperative Extension Service that all persons shall have equal opportunity and access to the programs, services, activities and facilities without regard to race, color, sex, religion, national origin, age, marital status, parental status, sexual orientation, disability or status as a veteran.

### References

- Care and Operation of Small Gasoline Engines
- Operating Groundskeeping Equipment

www.aavim.com  
1-800-228-4689

- Compact Equipment: Engines
- Electronic and Electrical Systems
- Compact Equipment: Safety Management for Landscapers, Grounds - Care Businesses and Golf Courses

John Deere Publishing  
[http://www.deere.com/en\\_US/services\\_and\\_support/manuals/john-deere-publishing.page](http://www.deere.com/en_US/services_and_support/manuals/john-deere-publishing.page)

- State Extension Lawn and Garden Care Publications

Contestant's Name \_\_\_\_\_ State \_\_\_\_\_ Number \_\_\_\_\_

### NATIONAL YOUTH LAWN TRACTOR CHALLENGE

EVENTS	PENALTY POINTS
Written Examination	_____
Parts Identification	_____
Safety	_____
Operation	_____
<b>Total Penalty Points</b>	_____
<b>(Low score wins)</b>	

#### Event No. I. Written Examination

Will consist of 25 multiple choice questions pertaining to the Lawn Tractor program and the operation, care maintenance, and safety of lawn tractors, including business management and lawn and turf management.

*Rules:*

1. Four penalty points will be given for each question answered incorrectly or unanswered.
2. Time limit 20 minutes.

*Scoring:* Questions missed \_\_\_\_\_ x 4 = \_\_\_\_\_ Total Penalty Points

#### Event No. II. Parts/Materials Identification

Will consist of a group of 25 numbered items which must be identified. Participant will place the item number beside the most correct item name on a list. Items or parts used in the Lawn Tractor program will be included (tractor and equipment parts, business items, lawn and turf material).

*Rules:*

1. Each item to be identified will be numbered.
2. Time limit 15 minutes

*Scoring:* Items missed \_\_\_\_\_ x 4 = \_\_\_\_\_ Total Penalty Points

**Event No. II — Lawn Tractor Identification**

Parts to be identified have numbers attached to them. Select the most correct part name from this list. Write the corresponding number beside the name. With some larger items, pictures are used.

**INSECTS**

- \_\_\_\_\_ Cut Worm
- \_\_\_\_\_ Sodweb Worm
- \_\_\_\_\_ White Grub

**EQUIPMENT PARTS**

- \_\_\_\_\_ Adjuster, mower height
- \_\_\_\_\_ Aerifork
- \_\_\_\_\_ Assembly, transport wheel
- \_\_\_\_\_ Battery, 12-volt
- \_\_\_\_\_ Bearing ball, sealed
- \_\_\_\_\_ Bearing ball, open
- \_\_\_\_\_ Bearing, needle
- \_\_\_\_\_ Bearing, sleeve
- \_\_\_\_\_ Bearing, tapered roller
- \_\_\_\_\_ Belt, flat
- \_\_\_\_\_ Belt, "V"
- \_\_\_\_\_ Blade adapter, rotary
- \_\_\_\_\_ Blade, reel mower
- \_\_\_\_\_ Blade, rotary mower
- \_\_\_\_\_ Blade, edger/trimmer
- \_\_\_\_\_ Cable, battery
- \_\_\_\_\_ Chain, flat
- \_\_\_\_\_ Chain, roller
- \_\_\_\_\_ Clip, retainer, external
- \_\_\_\_\_ Clip, retainer, internal
- \_\_\_\_\_ Clutch, pedal
- \_\_\_\_\_ Clutch, plate
- \_\_\_\_\_ Filter, air, dry element
- \_\_\_\_\_ Filter, air, oil foam
- \_\_\_\_\_ Fuse
- \_\_\_\_\_ Gear
- \_\_\_\_\_ Heat exchanger
- \_\_\_\_\_ Holder, fuse
- \_\_\_\_\_ Hose, hydraulic
- \_\_\_\_\_ Hydraulic lift cylinder
- \_\_\_\_\_ Lawn sprinkler head
- \_\_\_\_\_ Magneto, breaker-type
- \_\_\_\_\_ Magneto, solid state
- \_\_\_\_\_ Motor, hydraulic
- \_\_\_\_\_ Muffler
- \_\_\_\_\_ Pin, cotter (cotter key)
- \_\_\_\_\_ Pin, drawbar

- \_\_\_\_\_ Pin, hair
- \_\_\_\_\_ Pin, lynch
- \_\_\_\_\_ Pin, rolled
- \_\_\_\_\_ Pin, split
- \_\_\_\_\_ Plug, oil drain
- \_\_\_\_\_ Pulley, flat belt
- \_\_\_\_\_ Pulley, idler (tightener)
- \_\_\_\_\_ Pulley, "V" belt
- \_\_\_\_\_ Seal, oil/grease
- \_\_\_\_\_ Spreader, broadcast
- \_\_\_\_\_ Spreader, drop or thrust
- \_\_\_\_\_ Sprocket
- \_\_\_\_\_ Starting safety interlock component
- \_\_\_\_\_ Tie rod end
- \_\_\_\_\_ Tiller drag bar
- \_\_\_\_\_ Tiller tine
- \_\_\_\_\_ Tire, tractor, front
- \_\_\_\_\_ Tire, tractor, rear
- \_\_\_\_\_ Trans-axle
- \_\_\_\_\_ Tube, tire
- \_\_\_\_\_ Valve cap, tire
- \_\_\_\_\_ Valve core
- \_\_\_\_\_ Valve stem
- \_\_\_\_\_ Wheel lug bolt
- \_\_\_\_\_ Wheel lug nut
- \_\_\_\_\_ Wheel, mower

**PLANTS AND SEEDS**

- \_\_\_\_\_ Clover
- \_\_\_\_\_ Grass seed
- \_\_\_\_\_ Legume seed
- \_\_\_\_\_ Kentucky bluegrass

**MECHANIC AND GARDEN TOOLS**

- \_\_\_\_\_ Chuck, tire inflator
- \_\_\_\_\_ Clipper, grass
- \_\_\_\_\_ Clipper, hedge
- \_\_\_\_\_ Gage, spark plug gap
- \_\_\_\_\_ Gage, thickness or feeler
- \_\_\_\_\_ Gage, tire inflation
- \_\_\_\_\_ Hose, garden

- \_\_\_\_\_ Nozzle, garden hose
- \_\_\_\_\_ Spark tester
- \_\_\_\_\_ Valve spring compressor
- \_\_\_\_\_ Wrench, Allen (hex)
- \_\_\_\_\_ Wrench, socket, 1/2" drive
- \_\_\_\_\_ Wrench, socket, 3/8" drive
- \_\_\_\_\_ Wrench, spark plug
- \_\_\_\_\_ Wrench, ratchet handle 1/2"
- \_\_\_\_\_ Wrench, ratchet handle 3/8"
- \_\_\_\_\_ Wrench, T handle, 1/4" drive
- \_\_\_\_\_ Wrench, T handle, 3/8" drive
- \_\_\_\_\_ Wrench, torque 1/2"
- \_\_\_\_\_ Wrench, torque 3/8"

**WEEDS AND GRASSES**

- \_\_\_\_\_ Annual bluegrass
- \_\_\_\_\_ Carpetweed
- \_\_\_\_\_ Common chickweed
- \_\_\_\_\_ Common purslane
- \_\_\_\_\_ Crabgrass
- \_\_\_\_\_ Dandelion
- \_\_\_\_\_ Goosegrass
- \_\_\_\_\_ Ground Ivy or Creep Charlie
- \_\_\_\_\_ Knot weed
- \_\_\_\_\_ Plantain
- \_\_\_\_\_ Prostrate Spurge
- \_\_\_\_\_ Quackgrass
- \_\_\_\_\_ Shepherdspurse
- \_\_\_\_\_ White clover
- \_\_\_\_\_ Yellow nutsedge

**OTHER**

- \_\_\_\_\_ Card, business
- \_\_\_\_\_ Fertilizer, slow release
- \_\_\_\_\_ Fertilizer, granular
- \_\_\_\_\_ Glasses, reading
- \_\_\_\_\_ Glasses, safety
- \_\_\_\_\_ Ledger, accounting
- \_\_\_\_\_ Limestone, ground
- \_\_\_\_\_ Shoe, dress
- \_\_\_\_\_ Shoe, steel toed safety
- \_\_\_\_\_ Shoe, street

Items missed \_\_\_\_\_ x 4 = \_\_\_\_\_ Total Penalty Points

Contestant's Name \_\_\_\_\_ State \_\_\_\_\_ Number \_\_\_\_\_

**Event No. III — Lawn Tractor Safety**

**Procedure:** Each participant will be scored throughout the lawn tractor operation portion of the event. At some predetermined time, the safety judge will put an obstacle in front of the equipment being operated by the participant. The participant is expected to stop immediately and remove the obstacle from the course (hand it to the safety judge).

<b>Scoring:</b>	Number Times	Penalty Points
-----------------	-----------------	-------------------

**Prestart Check** (Report each to safety judge) (5 minutes maximum)

- |  |      |       |
|--|------|-------|
| 1. Failure to check fuel level               | (25) | _____ |
| 2. Failure to check oil level                | (25) | _____ |
| 3. Failure to check coolant level            | (25) | _____ |
| 4. Failure to observe tire inflation         | (25) | _____ |
| 5. Failure to observe loose or missing parts | (25) | _____ |

**Obstacle Removal**

- |   |           |       |
|---|-----------|-------|
| 1. Distance traveled before stopping (inches) | _____ x 5 | _____ |
| 2. Failure to set brakes/park                 | (50)      | _____ |
| 3. Failure to disengage blade                 | (50)      | _____ |

**Starting Safely**

- |  |            |       |
|--|------------|-------|
| 1. Failure to check neutral position/parking brake   | _____ x 25 | _____ |
| 2. Failure to disengage clutch while starting engine | _____ x 50 | _____ |

**Driving Safely**

- |   |             |       |
|---|-------------|-------|
| 1. Start forward motion smoothly  | _____ x 25  | _____ |
| 2. Failure to ride on seat  | _____ x 100 | _____ |
| 3. Skidding or spinning tractor wheels (Scuffing of inside wheel on turning does not count as a skid.) Skid of the front tractor wheel will not count until the skid equals or is greater than the width of the tire. | _____ x 50  | _____ |

**Mounting and Dismounting Safely**

- |  |             |       |
|--|-------------|-------|
| 1. Failure to set brakes before dismounting (Transmission set in park or locked position counts as brakes locked.) | _____ x 50  | _____ |
| 2. Failure to bring tractor to complete stop before dismounting.   | _____ x 100 | _____ |

**Other Safety**

- |                           |             |       |
|---------------------------|-------------|-------|
| 1. Using tobacco products | _____ x 100 | _____ |
| 2. Extra riders           | _____ x 100 | _____ |
| 3. Other unsafe practices | _____ x 100 | _____ |

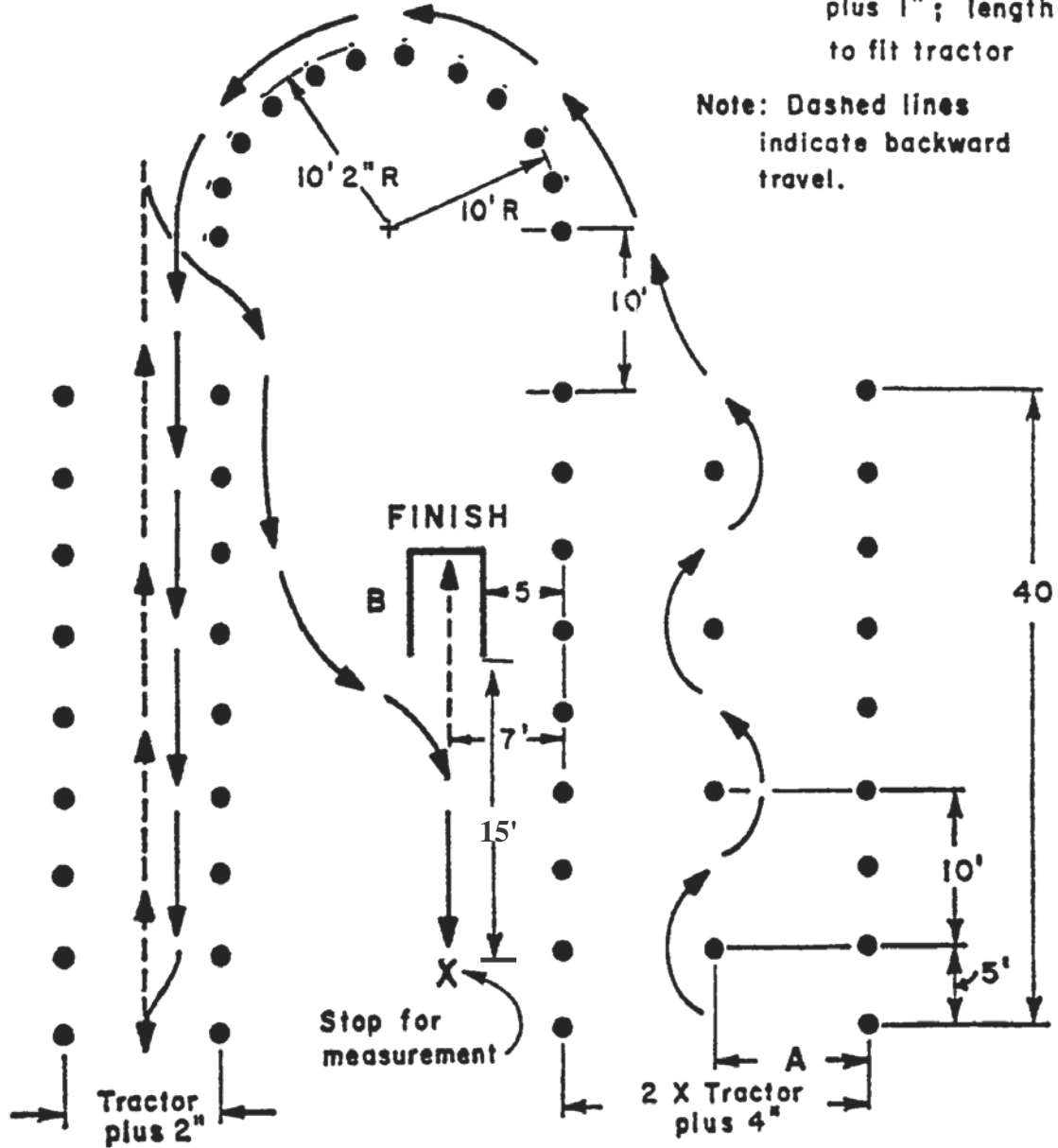
TOTAL SAFETY PENALTY POINTS \_\_\_\_\_



A = Width of tractor  
plus 2"

B = Width of tractor  
plus 1"; length  
to fit tractor

Note: Dashed lines  
indicate backward  
travel.



LAWN TRACTOR  
OPERATION COURSE

S  
T  
A  
R  
T