

LAWNMOWER OPERATIONS & MAINTENANCE for High School FFA Contest

I. OVERVIEW

The Lawnmower Operations & Maintenance contest is an individual event, with three parts.

1. The contestant will answer questions on a written exam dealing with lawnmower operations, maintenance, and safety.
2. The contestant will have to determine the problem and the best solution to the problem in ten problem solving questions.
3. The contestant will have a practical driving test where he/she will exhibit his/her skills in driving a commercial Zero Turning Radius (ZTR) lawnmower through a designed course.

II. PURPOSE

The Lawnmower Operations & Maintenance contest is designed to develop skills in operating commercial lawnmowers and various pieces of machinery safely, as well as maintaining the commercial lawnmower in a **safe and** productive manner.

III. ELIGIBILITY

Students in grades 9 – 12 who are current active FFA members are eligible to participate.

Chapters are limited to three contestants per chapter at regional level with top three individuals from region competing in WV State Contest.

IV. RULES

The following rules will govern the driving:

1. Time begins when the lawnmower crosses the start/finish line.
2. No one will be allowed in the career development event area except the contestant and officials.
3. Safety violations will be noted by the judges. Three safety violations will disqualify the contestant at the discretion of the judges. Safety is recognized as of utmost importance.
4. Time ends when lawnmower crosses the start/finish line.
5. Course layout will be printed in the bulletin.
6. A lawnmower of a like model will be available for practice and acclimation.

V. EVENT FORMAT

The contest will consist of three parts:

Part I – Written Exam – 20 Points. Contestants will *have 30 minutes to* answer twenty multiple-choice questions on lawnmower servicing, safe operation, care, and maintenance.

Part II – Problem Solving – 20 Points. Contestants will *have 30 minutes to* answer ten multiple-choice problem solving activities relating to lawnmower servicing, safe operation, care and maintenance.

Part III – Lawnmower Driving – 60 Points. The following lawnmower operations will be tested:

- A. Explaining pre-warm up procedure.
- B. Driving the lawnmower off the trailer.
- C. Driving the lawnmower through a course lined with stakes not more than three feet apart with 7” clearance on each side.
- D. Returning the lawnmower to the trailer in the forward position, the wheels of the mower must be centered on the trailer.
- E. Checking mowing height (height to be determined by the judge).

VI. SCORING

Part I – Written Exam – 20 Points (Each correct answer counting 1 point).

Part II – Problem Solving – 20 Points (Each correct answer counting 2 points).

Part III – Lawnmower Driving – 60 Points (Refer to the driving score card that is attached).

*Pre-Warm Up:

1. Failure to check:
 - a. Engine oil level_____40 points
 - b. Hydraulic fluid level_____30 points
 - c. Cooling System_____30 points
 - d. Checking Mower Deck Height_____30 points
 - e. Air in tires_____20 points
 - f. Belt tension and wear_____10 points
 - g. Fuel level_____10 points
 - h. Wheel lugs_____10 points
 - i. Check battery _____10 points
 - j. Safety equipment_____20 points
(Belt shields, ROPS, Brake lock, Seat belt, Safety starting switch)

*These practices will be in the form of a visual check up with the contestant explaining to the judge (s) how each is accomplished in detail.

2. Driving Lawnmower
 - a. Efficient completion of skill – One point deducted for each second over 150 seconds (2-1/2 minutes).
 - b. Attempting to move lawnmower with parking brake engaged – number of times X 10.
 - c. Pull-ups and back-ups to improve position – number of times X 10.
 - d. Markers scraped – number of times X 30.
 - e. Markers moved or upset – number of times X 60.
 - f. Number of inches lawnmower wheels off center on trailer – number of times X 20.
 - g. Mower deck height when loading and unloading mower – number of times X 60.
 - h. Mower deck height set when mowing – number of times X 60.
3. Safety measures when driving lawnmower
 - a. Excess speed when turning and driving – number of times X 40.
 - b. Mounting lawnmower improperly - number of times X 20.
 - c. Dismounting lawnmower improperly - number of times X 20.
 - d. Failure to kill or shut engine off when dismounting – 100.
 - e. Failure to setting brake when dismounting - 100.
 - f. Releasing brake before starting - 20.
 - g. Used seat belt –100. (Seat belt should only be used when lawnmower is equipped with roll-over protective structure – “ROPS”)

VII. TIE BREAKERS

In the event of a tie in the overall contest, the contestant with the highest driving score will be declared the winner. Second place will be the contestant with the highest problem solving score, while third place will be the contestant with the highest written exam score.

VIII. COURSE LAYOUT

1. The operation portion of this contest shall take place on a relatively level area that shall not exceed an area that measures **50' X 75'**. The boundaries of this area will be marked. Any contestant that crosses the boundaries of this area during the operation portion of this competition will be disqualified.
2. The mower will be stationed on a utility trailer. A timing line will be marked across the front of the

trailer. Time will begin and end when the front wheels of the mower have crossed the timing line.

3. The “alley” will consist of two 90 degree angles that form a “step” shape. (Imagine a line that runs East for 20’, turns South for 15’, and then continues East for 15’.) All measurements for the “alley” will be based on this marked line. The width and all openings for the “alley” will be determined based upon the mower deck width + discharge chute of the mower + 14” in use for the competition.
4. Two five gallon buckets, two barrels, or two automobile tires will be placed in the course so that the contestant will have to circle each, as if they were mowing around trees, before returning the mower to the trailer. These objects will be set apart determined by the **diagonal width** measured from the center of the inside front wheel to the outside center of the opposite rear wheel + **12 inches**. Markers from the buckets, barrels, or tires will be set at the same width **apart**.
5. A marker is considered scraped when it has been touched or moved by any part of the mower. An “**upset**” will be considered as moving a marker more than **two inches** from its station.
6. The course will be navigated with the mowing deck set at a cutting height to be determined by the judge. **The mower PTO will NOT be engaged.**

IX. REFERENCES

Texts

Small Engines by R. Bruce Radcliff (Authorized by Briggs & Stratton), Second Edition, 2004, American Technical Publishers. ISBN 978-0-8269-0012-8

John Deere – Fundamentals of Compact Equipment Series

Compact Equipment: Safety Management for Landscapers, Grounds-Care Businesses and Golf Courses. A primer of safety procedures for compact or outdoor power equipment. Book © 2001

Compact Equipment: Engines. A primer of test and repair procedures for compact-equipment engines.

http://www.deere.com/en_US/compinfo/publications/john_deere_publishing/complete.html

Turfgrass Science and Management by Robert Emmons, Second Edition, 1995, Delmar Publishers. Chapter 11. Mowing

http://www.delmarlearning.com/Browse_CatalogDetail_Print.aspx?xxID=27423&isbn=1418013307

AAVIM – All Machinery Related Publications

Lawnmower Operators Manuals (the following list is only examples not intended to be comprehensive!)

<http://www.troybilt.com/wcsstore/pics/TroyBilt/769-03502.pdf>

<http://www.troybilt.com/wcsstore/pics/TroyBilt/769-03537.pdf>

<http://www.troybilt.com/wcsstore/pics/TroyBilt/769-03532.pdf>

<https://www.managemyhome.com/mmh/user-profile/CreateUserProfileDisplay.action?> **Sears Craftsman Manuals**

http://www.usa.husqvarna.com/support_manual_search.aspx

<http://www.snapper.com/manuals/#>

<http://www.exmark.com/Manuals.htm>

http://www.usa.husqvarna.com/support_manual_search.aspx/landscapers.aspx

<http://www.snapper.com/manuals/#> Select Z Rider

http://manuals.deere.com/cceomview/OMM157372_H7/Output/Index.html

<http://www.dixiechopper.com/support.php>

http://manuals.deere.com/cceomview/OMM157372_H7/Output/Index.html

Lawnmower Engine Manufacturers Service and Repair Manuals

Lawn Equipment Operators Manuals

Lawnmower Dealer Brochures

X. OTHER HELPFUL INFORMATION

Lawn Equipment Videos

http://www.deere.com/en_US/homeowners/safety/video.html?tm=ho&link=cnav

<http://www.dixiechopper.com/support.php>

Safety/Maintenance Publications

http://www.deere.com/en_US/homeowners/safety/mowermaintenance.html?aid=

http://www.grounds-mag.com/news/mowers_052606/

<http://msucare.com/pubs/publications/p1097.pdf>

<http://www.toro.com/safety/index.html>

http://www.cdc.gov/nasd/menu/topic/machinery_mowers.html

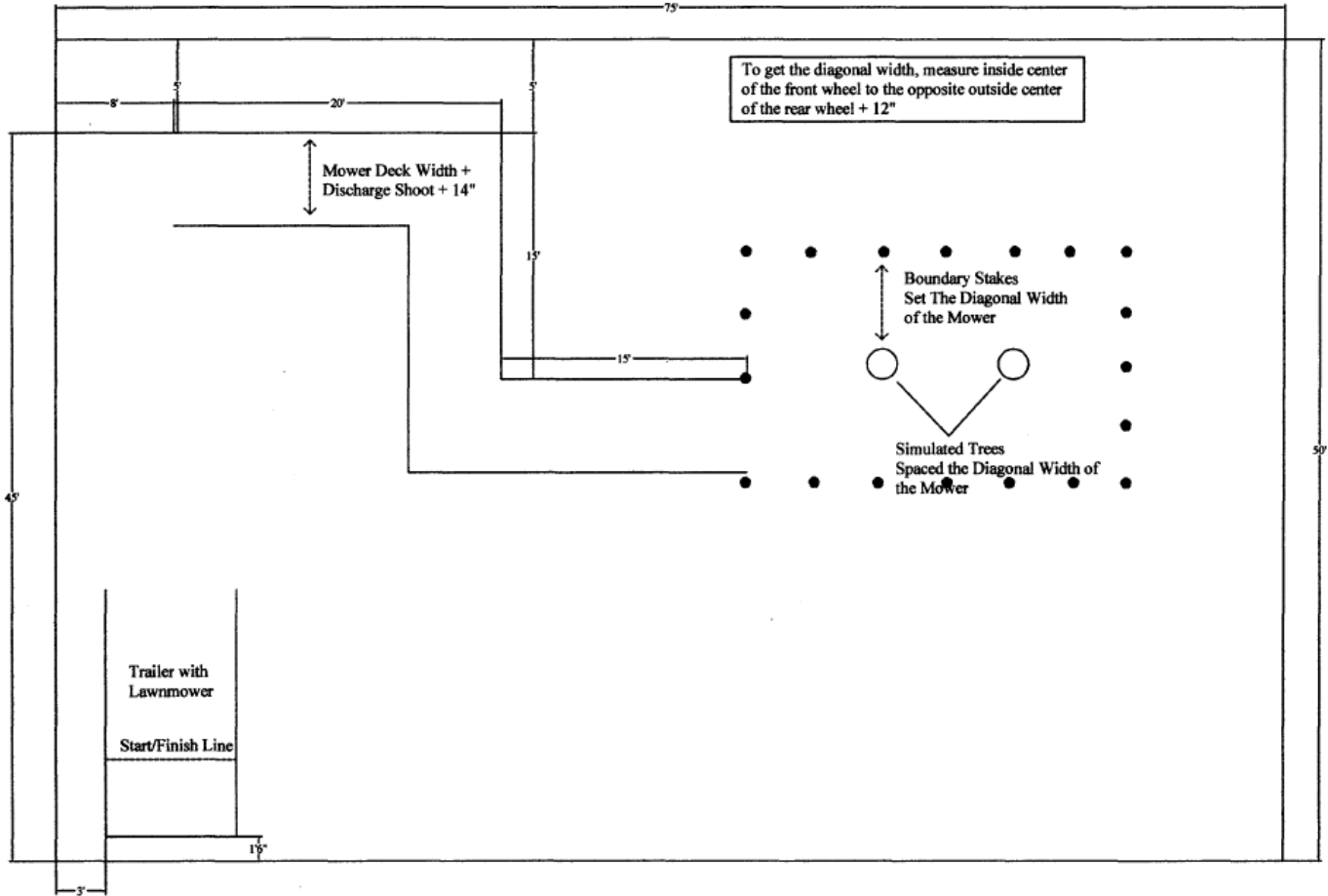
<http://www.nsc.org/resources/issues/agrisafe.aspx>

SCORE CARD – FFA SENIOR LAWNMOWER DRIVING

NAME OF CHAPTER _____ CONTESTANT _____

PRE-WARM UP	NO. TIMES OFF	TOTAL POINTS
Failure to Check:		
A. Engine oil level		X 40
B. Hydraulic fluid level		X 30
C. Cooling system		X 30
D. Checking Mower Deck Height		X 30
D. Air in tires		X 20
E. Belt tension and wear		X 10
F. Fuel level		X 10
G. Wheel lugs		X 10
H. Check Battery		X 10
J. Safety equipment (Belt shields, ROPS, Brake lock, seat belt, safety starting switch)		X 20
<u>DRIVING LAWNMOWER</u>		
1. Efficient completion of skill - No. seconds over 150		X 1
2. Attempting to crank lawnmower with kill switch engaged		X 10
3. Deck height when loading & unloading		X 60
4. Deck height set at mowing height		X 60
5. Pull-ups & backups to improve position in shed or lane (No. times)		X 10
6. Markers scraped (Number)		X 30
7. Markers moved or upset (Number)		X 60
8. Operating mower in the proper direction		X 30
9. Number of inches wheels off center in shed		X 20
<u>SAFETY</u>		
1. Excess speed when turning & driving (No. times)		X 40
2. Mounting lawnmower improperly		X 20
3. Dismounting lawnmower improperly		X 20
4. Failure to shut down mower in the proper procedure		X 60
5. Failure to kill engine when dismounting		X 100
6. Failure to apply parking brake when dismounting		X 100
7. Failure to unlock parking brake before putting mower in motion		X 20
8. Mower Deck (Blades) Engaged		X 100
8. Used seat belt (No. of failures) (Seat belt should only be used when tractor is equipped with rollover protective structure - ROPS)		X 100
TOTAL PENALTY PTS.		
60- <u>NO. OF PENALTY POINTS X 60</u> = DRIVING SCORE		
1000		

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