

ACHIEVING THE BEST IN CUT QUALITY: A COMPARISON BY PENN STATE UNIVERSITY

A Review of Top Brands of Tractor-Mounted
Rear Discharge Finish Mowers

When we look at beautifully manicured lawns, grounds or other grassy areas, we inherently know what is missing. Clumps, visible rows and uneven blades of mown grass are nowhere in sight. The absence of these flaws contribute to high marks in "cut quality", which has consistently ranked as the most important priority among users of tractor-mounted finish mowers.

CUT QUALITY - DEFINED

So, how is cut quality defined and measured? Users describe it as a combination of three distinct attributes:



Evenness of Cut

This refers to the uniformity of height of the turf surface after mowing. When you look at the cut path, there should not be any streaking or extended grass blades.



Material Distribution

This is the arrangement of cut material on the surface of the turf. The desirable effect is no rows of accumulated cut material, also known as "windrowing".



Clippings Dispersal

This attribute refers to the spreading or scattering of cut material over the surface of the turf. Poor clippings dispersal results in clumping.

SUCCESS IN ALL THREE OF THESE ATTRIBUTES RESULTS IN THE BEST OVERALL CUT QUALITY.

COMPARING TOP BRANDS OF FINISH MOWERS FOR CUT QUALITY

Field Trial Background

Recently, Woods® contracted a research project with The Pennsylvania State University. The research involved use of four top brands of rear-mount, rear-discharge, tractor-mounted finish mowers at its Berks Campus in Reading, Pennsylvania. Penn State is well known for having one of the most highly rated [Turfgrass Management Programs](#) in the United States.

Under the guidance of turf expert Michael Fidanza, Ph.D, Professor of Plant and Soil Science, and Gary Nolan, a Ph.D. Graduate Student, four brands of 60" Standard Mowers and 72" Commercial Mowers were evaluated for cut quality across a mature stand of Dakota tall fescue grass.

The field trial site was maintained at a cut height appropriate for lawns and parks. The turf was fertilized in early April, including a preemergence herbicide for crabgrass control, and a broadleaf herbicide treatment in mid-May. The site was irrigated as needed.

Field Trial Testing Plots

All plots were mowed approximately once per week, from June 1 through October 19, 2021 at a mower cut height of 3 - 5". The turf height prior to mowing was typically 7 - 8". Immediately after each mowing event, plots were visually evaluated for the three cut quality characteristics.

The test site was divided into individual plots. At the 60" mower site, plots were 60" wide by 30' long; at the 72" mower site, plots were 72" wide by 30' long. Each mower was tested across multiple plots and the results were aggregated.

Field Trial Testing Plots

60" Conventional 3-Point Hitch

1. Woods® TurfKeeper™ TK60.20

2. Competitor #1

3. Land Pride® FDR16

4. Bush Hog® HDTH5

72" Conventional 3-Point Hitch

1. Woods® TurfKeeper Pro™ TKP 72.40

2. Competitor #1

3. Land Pride® FDR25

4. Bush Hog® HDTH6

Evaluations / Scoring Breakdown

Evaluations took place in three phases in summer/fall of 2021, beginning in June and ending mid-October. All eight mowers were evaluated on the key attributes of:

- Evenness of Cut (1 to 5 scale)
- Material Distribution (1 to 5 scale)
- Clippings Dispersal (1 to 5 scale)

Scores were attributed to these characteristics for each mower and combined for a total score. In every category, the highest score is the best.

Statistical Analysis

Each cut quality characteristic was evaluated based on visual observation and ranked on a scale of 1 to 5 (with 5 being best). Data collected was subjected to the analysis of variance (ANOVA) and the treatment means were compared, providing results with a 95% confidence level.

FINDINGS OF THE STUDY

The competition included two distinct categories of mowers:

60" Standard-Duty Finish Mowers

72" Premium-Duty Finish Mowers

These finish mowers attach to a 3-point hitch on the rear of a tractor and use rotary cutting blades, which are powered by the tractor's power take-off (PTO). The mowers are generally available in cutting widths ranging from 48" to 90", with cutting height adjustment typically between 1 – 5 inches. The mowers tested fall in the middle of these width ranges and represent those most commonly purchased.

The mowers tested in this study include **Woods® TurfKeeper™** and **Woods® TurfKeeper Pro™**, as well as three competitors within the same category. Below are the performance results, by cut quality characteristic, for the eight mowers tested.

EVENNESS OF CUT



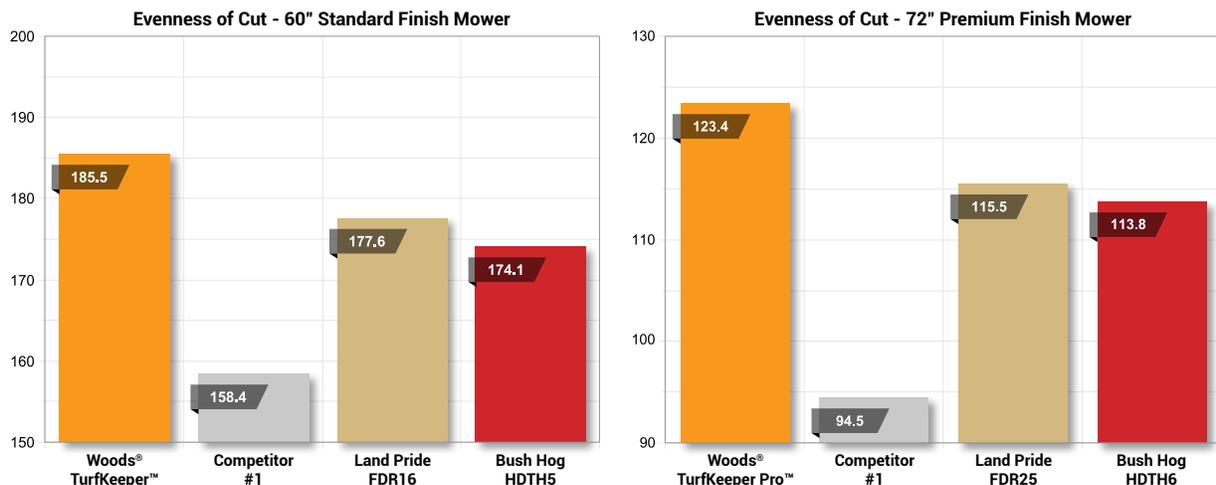
Unevenness of cut – extended grass blades remain within the cut area

Evenness of cut is the uniformity of height of the turf surface after mowing. It can be further defined as the lack of a visual presence of streaking or extended grass blades in the cut path. User feedback has identified that evenness of cut is the most desirable and important mowing attribute. Many factors affect evenness, including the design of the mower deck, "high-lift" blades and under-deck baffling, which all contribute to lifting grass blades to achieve an even cut. An additional design feature is the ability of the mower to closely follow the terrain.

The mowers tested ranked as follows on the evenness of cut attribute:

60" Standard Mower Rankings		72" Premium Mower Rankings	
Woods® TurfKeeper™	185.5	Woods® TurfKeeper Pro™	123.4
Competitor #1	158.4	Competitor #1	94.5
Land Pride FDR16	177.6	Land Pride FDR25	115.5
Bush Hog HDTH5	174.1	Bush Hog HDTH6	113.8

Figure 1. Evaluation of evenness of cut defined as the visual presence of streaking or extended leaf blades, on a 1-to-5 scale, where 1 = most streaking or worst visual evenness, 3 = minimum acceptable rating, and 5 = no streaking or best visual evenness; 5 is the best rating.



MATERIAL DISTRIBUTION

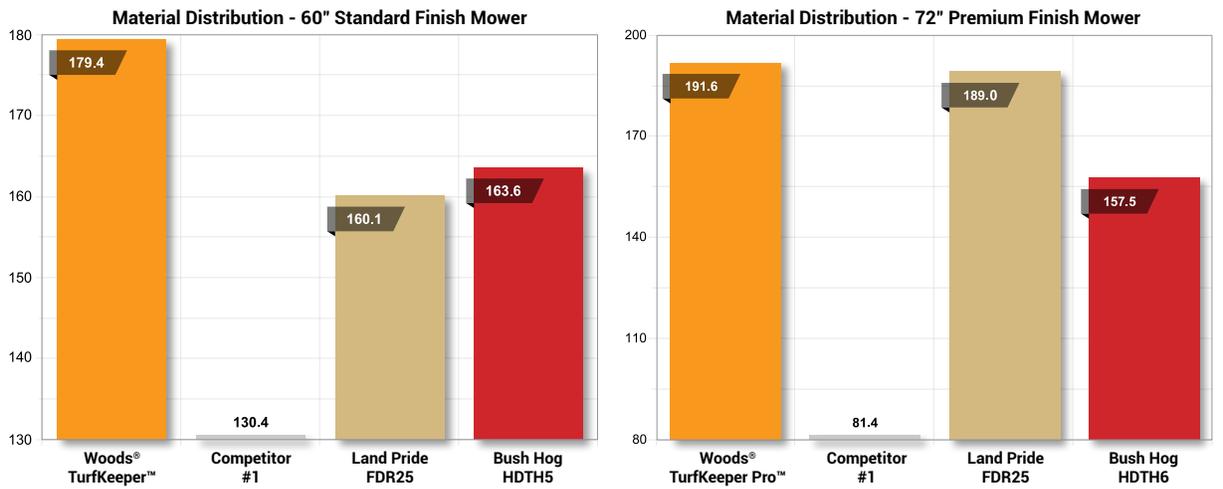


Undesirable material distribution – windrowing

Material distribution is the positioning, or arrangement, of cut material on the surface of the turf. An indication of desirable material distribution is the absence of windrowing, or rows of accumulated cut material. A mower deck designed with parallel side frames and under-deck baffling that controls the discharge direction of the cut material is critical for effective material distribution. **Mowers ranked as follows:**

60" Standard Mower Rankings		72" Premium Mower Rankings	
Woods® TurfKeeper™	179.4	Woods® TurfKeeper Pro™	191.6
Competitor #1	130.4	Competitor #1	81.4
Land Pride FDR16	160.1	Land Pride FDR25	189.0
Bush Hog HDTH5	163.6	Bush Hog HDTH6	157.5

Figure 2. Evaluation of material distribution, defined as surface material windrowing visual effects in cut path, on a 1 to 5 scale, where 1 = most windrowing or surface material visually present, 3 = minimum acceptable rating, and 5 = no windrowing or surface material present; 5 is the best rating.



CLIPPINGS DISPERSAL

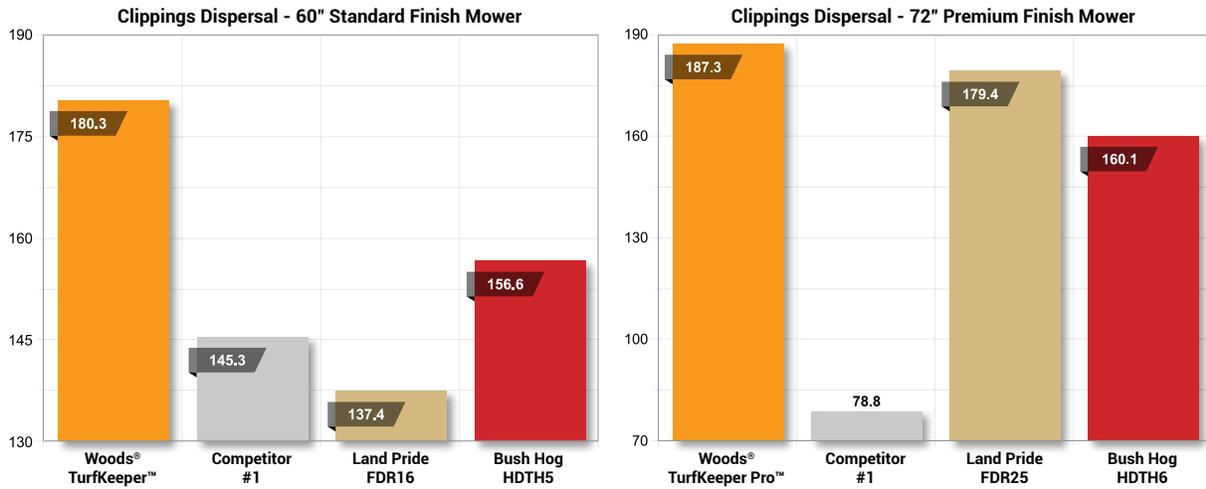


Undesirable clippings dispersal – clumping

Clippings dispersal is the spreading, or scattering, of cut material over the surface of the turf. Favorable clippings dispersal is the absence of "clumping." As with material distribution, the effective dispersal of clippings includes a parallel side-frame mower deck and under-deck baffling that controls the discharge direction. **The mowers in this test ranked as follows:**

60" Standard Mower Rankings		72" Premium Mower Rankings	
Woods® TurfKeeper™	180.3	Woods® TurfKeeper Pro™	187.3
Competitor #1	145.3	Competitor #1	78.8
Land Pride FDR16	137.4	Land Pride FDR25	179.4
Bush Hog HDTH5	156.6	Bush Hog HDTH6	160.1

Figure 3. Evaluation of clippings only from July 20 through October 19, 2021, defined as visual appearance specifically of clippings on the turf surface, on a 1 to 5 scale, where 1 = clippings dispersed/arranged predominately as a windrow or clumps, 3 = minimum acceptable rating, and 5 = very uniform dispersal of clippings over the plot surface; 5 is the best rating.

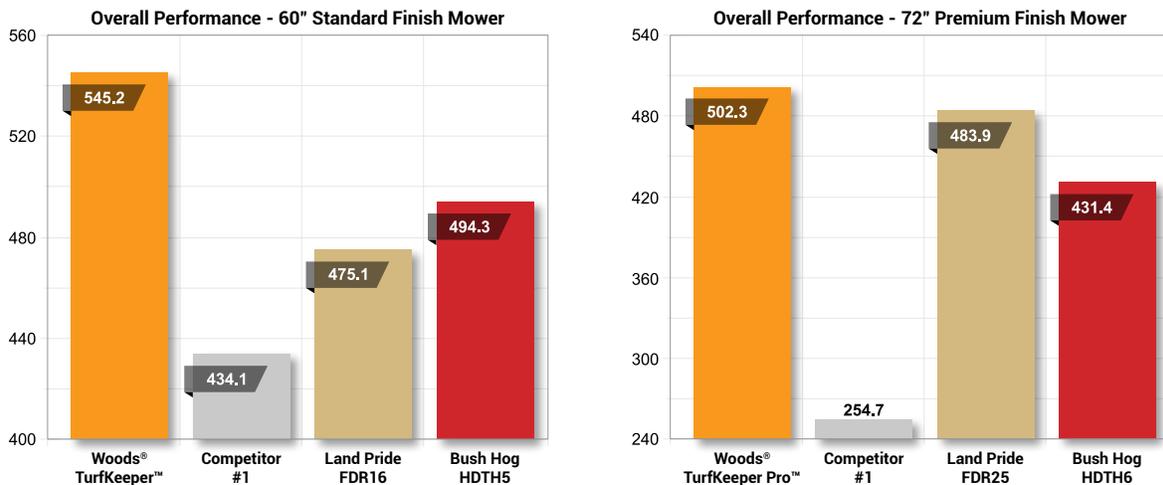


OVERALL PERFORMANCE RANKINGS - CUT QUALITY

Exceptional cut quality is the highest priority for users of rear-mount, rear-discharge, tractor-mounted finish mowers. Cut quality is defined by evenness of cut, material distribution and clippings dispersal, which were measured in this evaluation. The **Woods® TurfKeeper™** standard-duty and **TurfKeeper Pro™** premium-duty finish mowers were proven to outperform three competitive models in each of the measured test categories. **The mowers ranked as follows in overall performance:**

60" Standard Mower Rankings		72" Premium Mower Rankings	
Woods® TurfKeeper™	545.2	Woods® TurfKeeper Pro™	502.3
Competitor #1	434.1	Competitor #1	254.7
Land Pride FDR16	475.1	Land Pride FDR25	483.9
Bush Hog HDTH5	494.3	Bush Hog HDTH6	431.4

Figure 4. Overall Performance Rankings



CONCLUSION

When assessing the cut quality of mowers, the attributes shown in this study are of critical importance in producing a quality result for farmers, groundskeepers of public and private institutions, owners of large properties, professional landscapers and more.

The design and performance of the **Woods® TurfKeeper™** and **TurfKeeper Pro™** were shown to be superior. This is achieved through several superior design elements, including:

- 1) The unique baffling design, which provides superior lift so the tops of the grass blades receive an even cut.
- 2) The mower deck design, which incorporates parallel side frames and under-deck baffling that controls the discharge direction of the cut material for more effective material distribution and clippings dispersal.

With more than 75 years serving the agricultural industry, Woods® continues to lead in precision cutting attachments by working closely with users to understand their needs and continuously improve products for maximum performance.

For more information on the **Woods® TurfKeeper™** and **TurfKeeper Pro™** finish mowers, please visit the website at: woodsequipment.com. Or, contact (800) 319-6637 or email: woodsinfo@OregonTool.com

Bush Hog is a registered trademark of Alamo Group Inc. Land Pride is a registered trademark of Great Plains Manufacturing, Incorporated.

