



Transportation Research Division



Technical Brief 10 – 02

*Evaluation of the Kuper – Tuca SX36 Snow
Plow Cutting Edges*

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Introduction

For the winter of 2009-2010, the MaineDOT experimented with three sets of the Kuper – Tuca SX36 plow blades. Two of these sets were used in the Region 4, Bangor maintenance facility and one set was used in the Region 3, Turner facility.

MaineDOT also evaluated the Tuca SX36 as part of a research project during the winter of 2008-2009. The results of that evaluation are available in the Transportation Research Division Technical Brief 09-3 [Evaluation of Alternative Snow Plow Cutting Edges](#), May, 2009.

Methodology

The methodology for this evaluation was very straight forward. Plow blades were installed on three MaineDOT plow trucks and the miles of plowing recorded. Comparisons would be made using the data collected for the standard carbide plow blades as part of the 2008-2009 evaluation.

Results

Region 3 – Turner

The Tuca SX blades were installed in mid December and used throughout the winter of 2009-2010. The primary plow route included a section of Route 4 through Turner. This route is in good condition with paved shoulders. The SX blades are attached to a standard sweeper plow.

Unfortunately, plow miles were not recorded for this set of blades. The Crew Supervisor indicated that the blades appeared to clear the road as well as the standard carbide blades and the driver liked the fact that the truck seemed to vibrate less and the blades were quieter than the standard blade.

The winter season ended much earlier than usual and the blades were not worn to termination. The Crew Supervisor estimates that the blades have about a half season of life remaining.

Region 4 – Bangor

The Tuca SX blades were also installed in mid December at the Region 4, Bangor facility. One of the plow routes was located on Interstate 95 from Bangor to Alton and the other was located on Route 15

from Bangor to Corinth. The interstate route was in the right, or travel lane and considered to be in good condition, while the Route 15 route is a two lane road considered to be in fair to good condition.

The set of blades used on the Route 15 route were worn to termination and removed from service on January 29th. The total distance plowed with this set was 1,239 miles (see Photos 1 and 2). Excessive wear at the left, or driver end of the plow may be indicating the crown of the road played a part in this early failure. It should also be noted that the plow that this set were attached to is a reversible, or quick switch plow. This plow type weighs approximately 3,000 pounds, or about 640 pounds more than a sweeper plow weighing 2,360 pounds.



Photo 1: Failed Blades/Reversible Plow



Photo 2: Failed Blades taken from the left end.

The second set of Kuper blades evaluated in Bangor were utilized on Interstate 95 and mounted on a sweeper plow. Once again, the early end to the winter season did not allow the blades to be worn to termination (see Photos 3 and 4). This set had 1,408 miles of service recorded when the winter weather ended on January 29th. The crew supervisor estimates that the blades have approximately one half of their life remaining.

The supervisor and driver agreed that the Kuper blades are quieter than the standard blades. The driver did not feel they cleaned the road as well, while the supervisor believed they cleared the road about the same as the standard blade. The supervisor also theorized that the reason the Route 15 blades wore out before this set was because of the condition of the road. He feels the Kuper blade may be better suited for better constructed roadway sections, like the Interstate. He also feels that the Kuper blades are more susceptible to impact damage than the standard carbide blade.



Photo 3: Kuper Blades - Sweeper Plow



Photo 4: Kuper Blades – Sweeper Plow

Conclusions/Recommendations

As with previous efforts to evaluate the Kuper Tuca SX36 plow blades, a very small sample size was used. The early failure of one of the three sets coupled with the set for which there was no mileage available, greatly hindered this research effort. The early end of the winter season also made it impossible to determine the total mileage, or life expectancy of the remaining set.

Using data collected from 2007 through 2009 and assuming the Interstate 95 set has approximately 50 percent of its life remaining, the Tuca SX36 plow blade is providing an estimated 3,500 to 4,500 miles of wear life. When comparing this to the average wear life of 1,500 to 2,000 miles for a set of standard carbide blades, the Tuca SX is outlasting the standard blade by an approximate 2.25 to 1 ratio.

The cost of a set of standard carbide blades was \$352.99 for the 2009-2010 season. Using the \$1,782.00 cost per set of the Tuca SX blades, the Tuca would have to last five times as long as the standard blade to be cost effective.

The Tuca SX36 blade is performing better on the standard sweeper plow than the reversible plows, which are approximately 650 pounds heavier than the sweeper.

A conversation with the manufacturer indicated that the plows used in Europe are lighter than either our reversible or sweeper plows. The manufacturer believes this, coupled with different plowing strategies, is playing a part in MaineDOT not realizing the wear life typically seen in those European countries.

After 4 years of evaluation, it appears the Kuper Tuca SX36 plow blade does not provide a cost effective alternative to MaineDOT for its standard carbide blades.

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