Project Deliverable H: Prototype III and Customer Feedback
GNG 1103 – Engineering Design
Faculty of Engineering – University of Ottawa

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Introduction:

Prototyping allows you to perfect and test our ideas for the chosen subsets and to come up with ways to improve them for the final project. This prototype tested most of the remaining critical subsets of our attachment. It allowed us to perfect and test our ideas for the chosen subsets and to come up with ways to improve them for the final attachment.

Prototyping Objective:

To observe a further prototyping and be able to analyze the attachments based on the second physical model. In order to see if there are any additional physical issues on the attachments, the test plan that can reduce the risk of failure that would be generated. The third prototyping will allow us to meet the target range and specifications of critical functionalities and achieve the goal on the final design.

Prototyping Test Plan:

Why:

The purpose of testing the prototype is to ensure the functionality of the critical parts, and this time, we mainly focused on the front roller and the rake.

What:

The seed drop rate of the seed hopper is tested as well as the hopper closing/opening mechanism. The seed drop rate is tested with popcorn kernels to stimulate the grass seeds. The closing/opening mechanism was tested with human hands pulling the gate to stimulate the situation where Bowie's arm will be moving up and down. The functionality of the front roller and the rake are tested as well. The roller was tested by rolling it onto snow and beds to stimulate the soft soil environment. The rake was tested by dragging it with human hands on the ground for about 1 meter to test its mobility as well as the strength.

When:

The tests were performed right after the third prototype was being made to ensure that the results can be acquired as soon as possible as well as allowing us to make adjustments to the parts if the tests failed to perform.

Result/Feedbacks:

Erin's worries about the rake getting caught and/or stuck have been fixed by giving the rake a mobility component.

Previous Works and Improvements:

The prototypes that had been worked upon previously were the rake and hopper component. The hopper component's size was increased and it was completely sealed so that no seeds can fall through it. In order to improve the rake component we added an axle so as to make it more movable.

Conclusion:

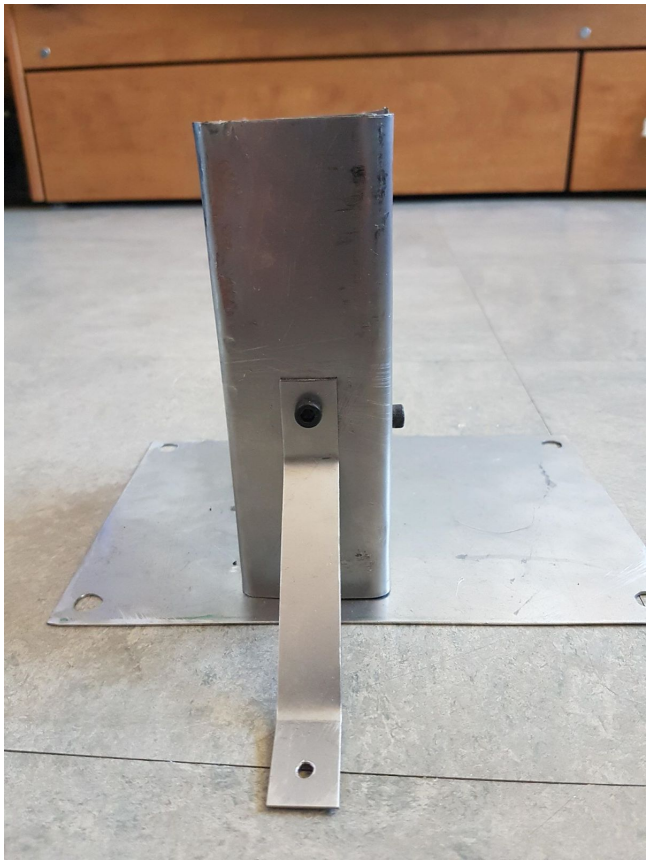
Prototyping is one of the most vital parts of a design process. It allows you to test your ideas and how they would actually operate. Using this feedback allows you to continue to improve the design for the final project without actually building the whole project and redesigning it each time something fails. This prototype is the teams work in the final stretch, this is very similar to the final design of the project, with only minor tweaks installed to further the efficiency of the attachments.

Pictures of Progress:

The Grass-Seed Hopper (with sliding platform, top view)

The Grass-Seed Hopper (with sliding platform, frontal view)

The Grass-Seed Hopper (with sliding platform, side view)



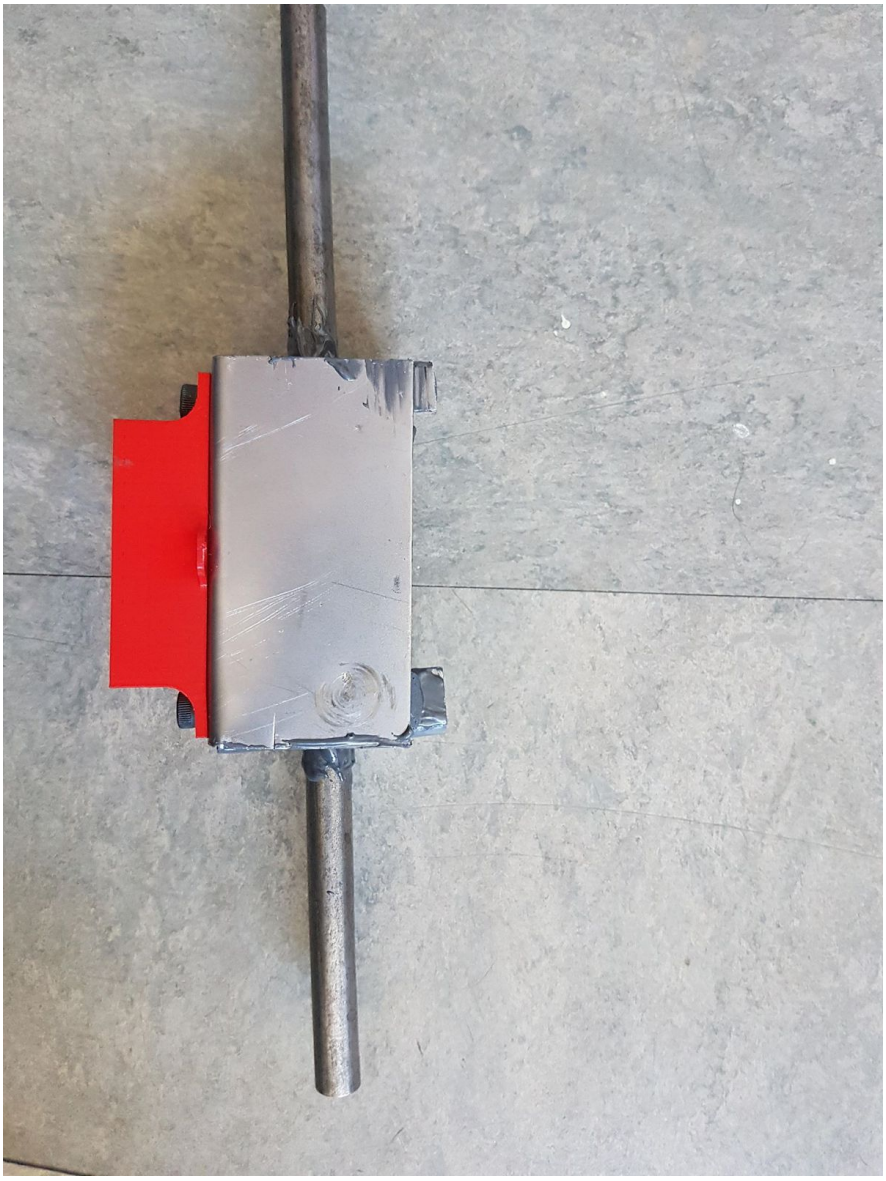
The Grass-Seed Hopper (with sliding platform, top view)

Back Rake Attachment (top view)

Back Rake Attachment (joint view)

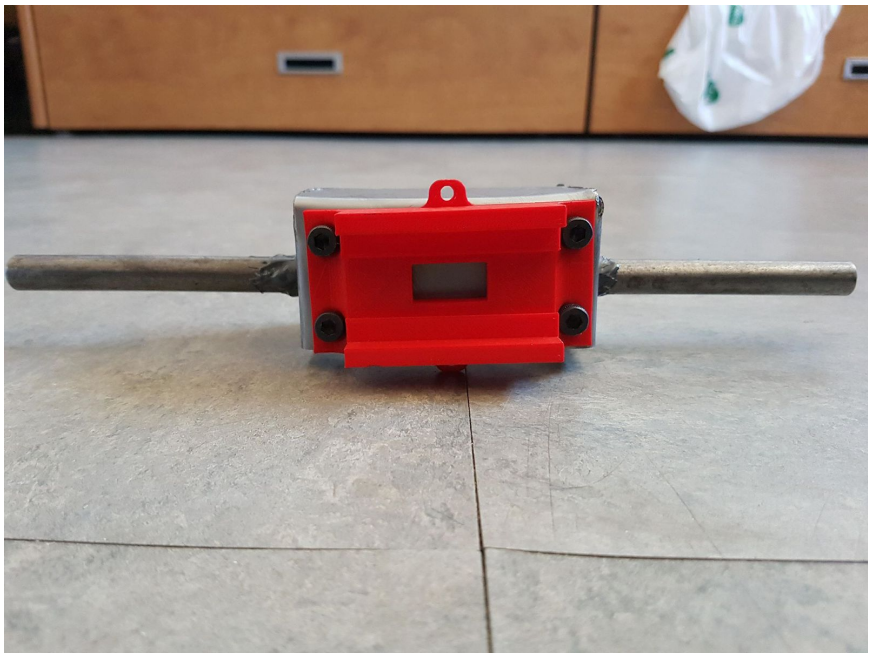
Back Rake Attachment (back of joint view)

Dovetail Roller Attacher (top view)



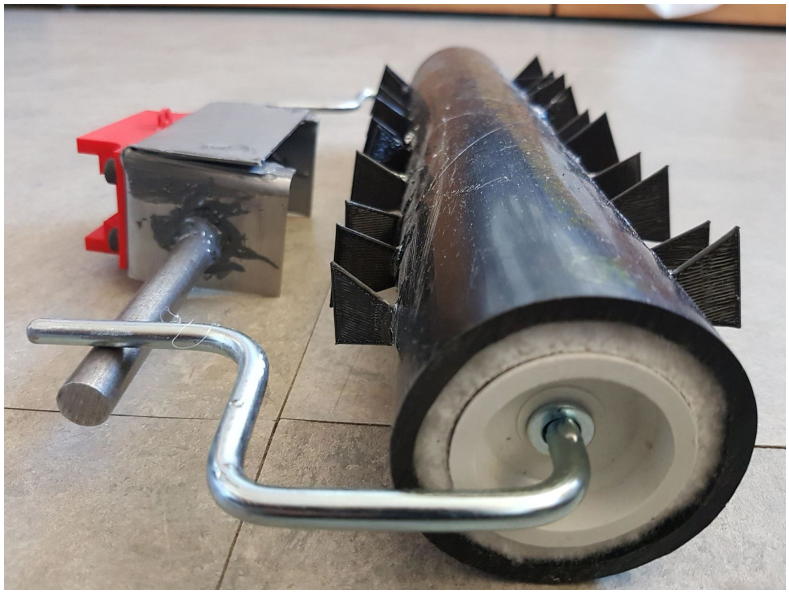
(Back Rake Attachment (full view)

Dovetail Roller Attacher (front view)



Dovetail Roller Attacher (back view)

Dovetail Roller Attacher (side view)

Dovetail Roller Attacher with Roller (full view)

Dovetail Roller Attacher with Roller (full view)