



# Cottesloe Coastcare's Hole Digging Auger

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August 2020



# Introduction

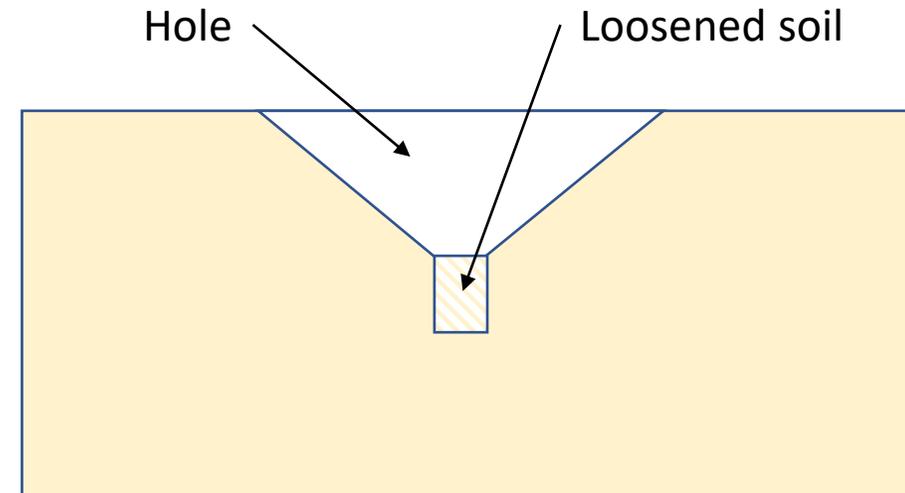
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- About three years ago Cottesloe Coastcare decided they needed to drastically speed up the hole digging process during planting.
- Aging members and bad backs helped added impetus to the project.
- We decided to invest in a powered earth auger and developed a novel auger tool which produces special holes suited to our needs.
- This system digs holes in under 5 seconds in softer soils and allows one fit person to dig many hundreds each day, thus drastically speeding up planting.



# The Desired Hole

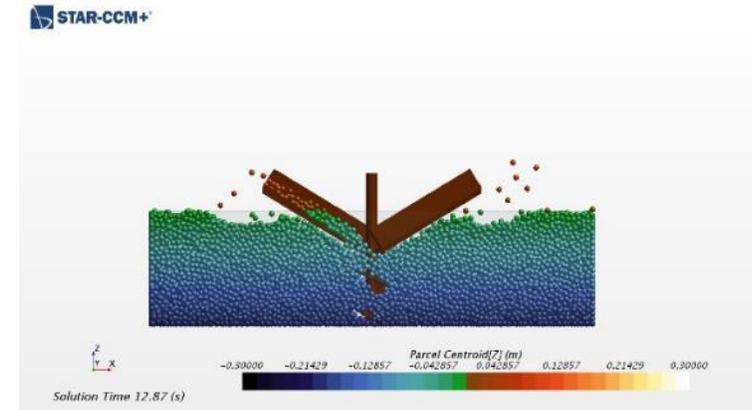
- In our soft coastal soils we have had most success when holes are deep and shaped conically.
- This hole shape has these benefits:
  - Removing weed seeds from near the planted seedling;
  - Provides some wind protection for the seedling planted at the bottom of the hole;
  - Acts as a water catchment concentrating rainfall in the root zone of the seedling;
  - Provides a sump to allow comprehensive summer watering without loss of water through run-off on the non-wetting sands.



- We also wanted to minimise the planter's efforts and so the auger had to loosen the soil at the base of the conical hole.

# Tool Development

- Several design ideas were mathematically modelled using the Discrete Element Method and one was shown to have good potential.
- Based on that work, Mark 1 prototype was constructed and successfully dug hundreds of holes in the 2019 planting season.
- Subtle improvements were made to the first model and the new Mark 2 version has proven even better during the recently completed 2020 plantings.



DEM modelling of the Mark 1 design



Mark 1



Mark 2

# Operation and Maintenance

- It works best in wet or moist sandy soils but can be used when soils are dry.
- It will handle and eject small stones up to around tennis ball size but larger rocks, once exposed, may require hand removal from the hole.
- The blades are made from mild steel and, depending on the nature of the soils, will need periodic sharpening with an angle grinder.



## More Information

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- There are two components to our hole digging system:
  - ❑ A Stihl BT 131 professional single-operator earth auger which cost around \$1500 from machinery shops. This weighs 10kg so most adults can operate. It has special safety features such as an instant clutch which disengages the engine if the auger encounters a solid object.
  - ❑ Our novel auger is made locally and costs about \$500, depending on how many we order at one time.



Stihl BT 131 earth auger



Our system in action



[Click here for video of CCA's Mark 2 auger digging in harder verge soils](#)