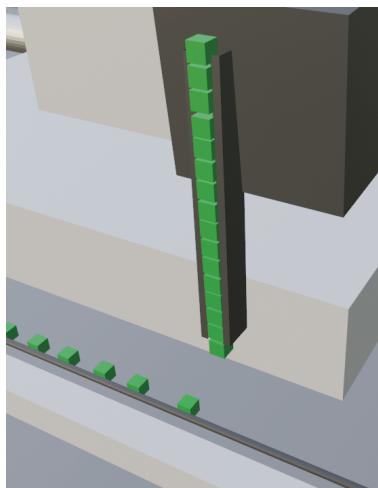


Figure 1 - Ariadne precision sowing robot



Seed cubes are stacked in a tool. The tool traverses the thread, precision glueing the seeds in place.

It is envisaged that the system could autonomously pick seeds from different hoppers, place them in the stack, and then attach them to the thread.

Figure 2 - Seed cube detail view

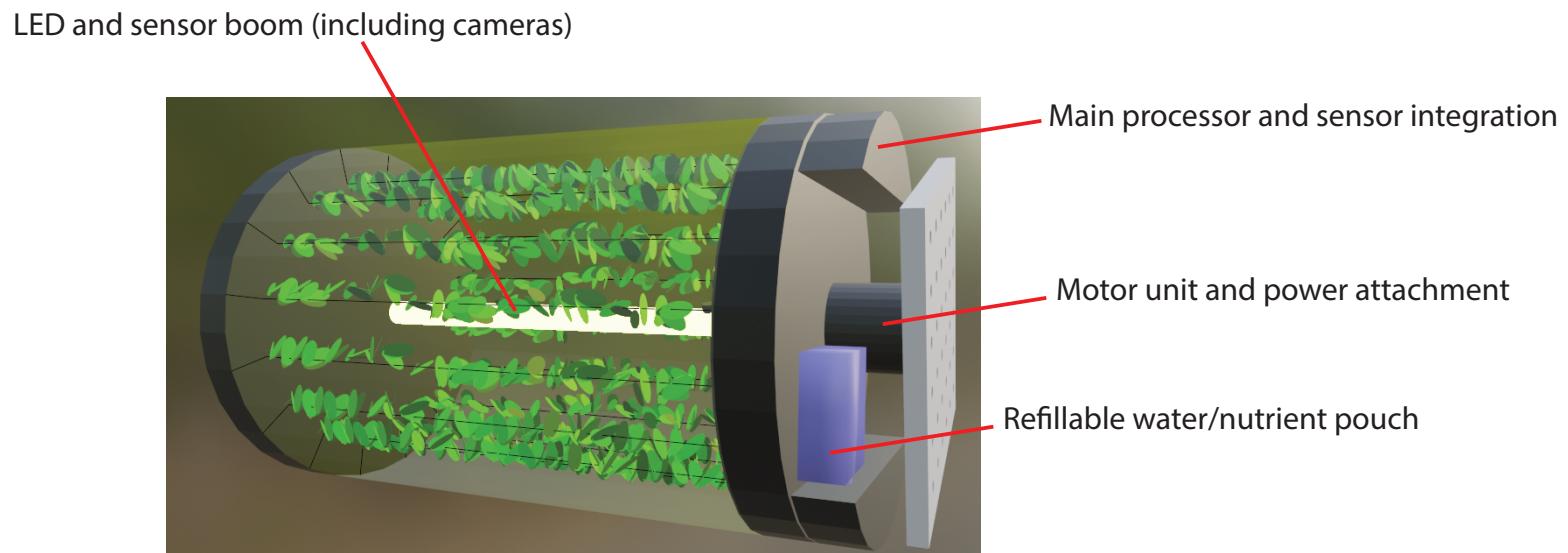
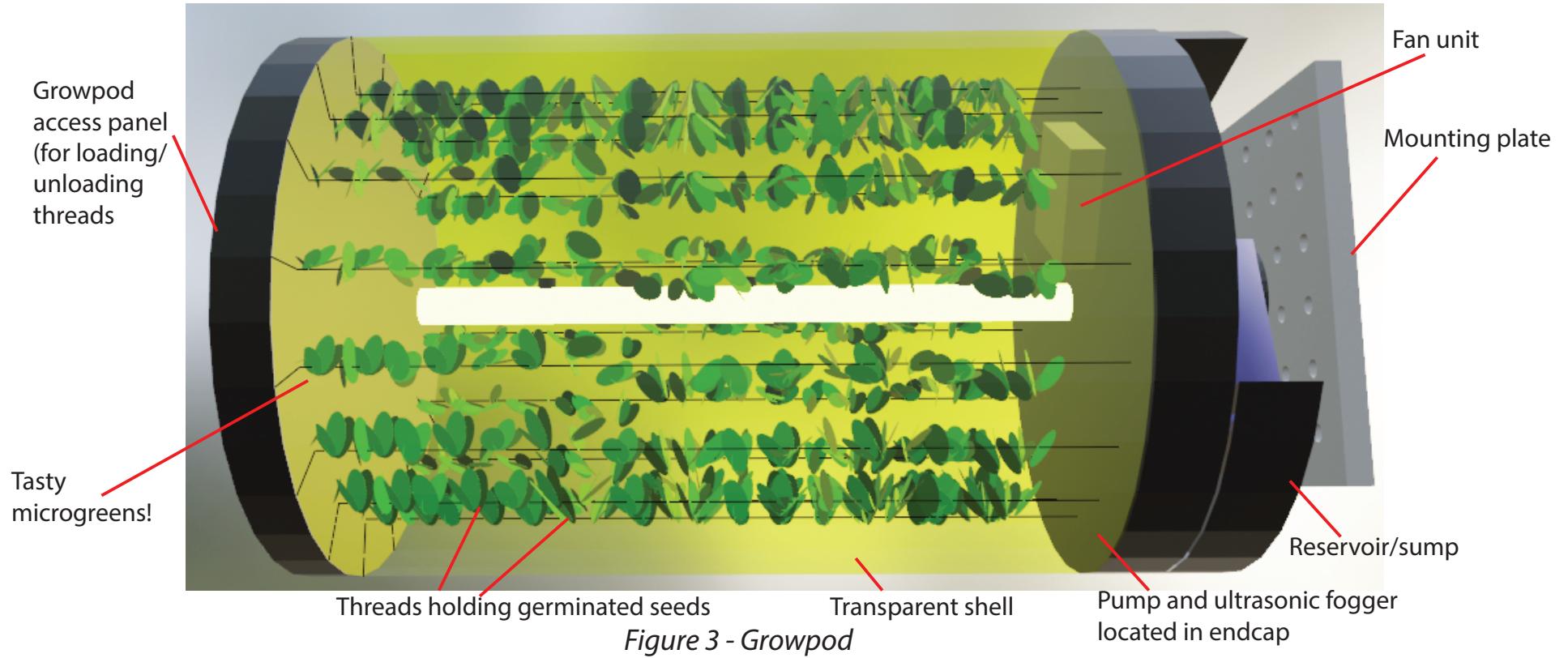


Figure 4 - Growpod end view

Requirements v1 03/Oct/2021

All requirements marked on the MoSCoW scale (**M**ust have, **S**hould have, **C**ould have, **W**on't have)

Ariadne robot requirements

Be at least twice as quick (from the crew's point of view) than if crew had to carry out manually	M
Be able to automate seed sowing	M
Be able to pick up seeds	M
Be able to position seeds precisely	S
Be able to attach strings to seeds	M
Be easy to clean/sanitize	M
Be able to manipulate and load seeds autonomously	M
It must be possible to load seeds manually	M

Growpod requirements

Be easy to clean/sanitize	M
Be able to provide correct lighting conditions for growth	M
Ebb/flow fogger or water system to ensure that roots are not permantly wet	M
Leaves must stay relatively dry	M
System must keep track of planting, growth	S
Recommend when to harvest particular threads	S
Be able to autonomously devise and conduct planting experiments to maximise usage of the system	C
Respond to crew feedback	C
Be able to be programmed by ground control	M
Be space efficient when stowed	M
Be light	S
Be power efficient	M
Stay within plant heat parameters	M
Be able to grow microgreens	M
Be able to provide correct moisture levels to seeds	S
Be able to provide correct moisture levels to seedling/microgreen roots	M
Be able to provide correct nutrients to plants	M
Be able to grow microgreens for at least 3 weeks	M
Be able to collect data on plant growth including imaging	M
Seeds should be able to sprout from seed cubes	M

Software requirements

Be able to display internal state and plant state to crew and ground control	M
Be able to keep track of individual plants	S
Be able to devise and carry out planting experiments	S
Be able to gather data and transmit to ground station	S
Be able to interact with the crew via voice interface	C
Be able to instruct crew which particular threads are ready for harvest	C
Be able to predict when particular harvests will be ready	C