PINE SEEDLING LIFTER | UC

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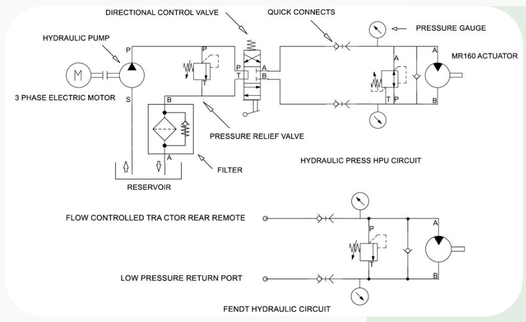
PROBLEM & GOAL

Bare root seedlings are currently lifted from nursery beds using labour intensive processes. The M14 project aims to reduce manual labour and root damage while developing a robust system suitable for commercialisation.

Lifting Belts

- 8 foam-covered belts grip, lift and transfer seedlings.
- Improved belt joints and adhesives validated for durability.
- Improved robustness and reliability.

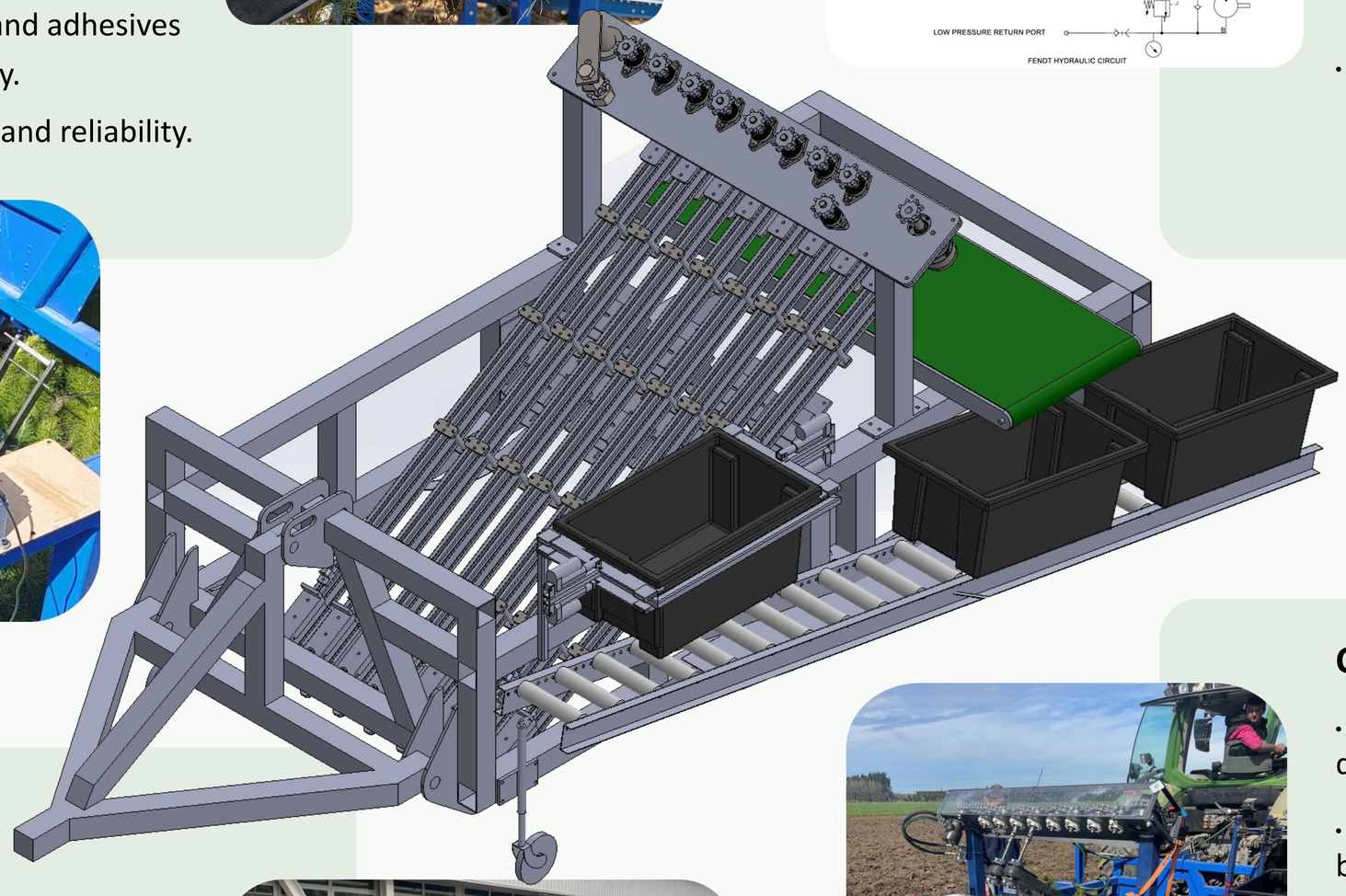




Hydraulics and Chain Drive

- Bosch Rexroth MR160 hydraulic motor drives four lifters through a guarded chain drive.
- Tractor rear remote flow control provides adjustable belt speed.







Chassis Design

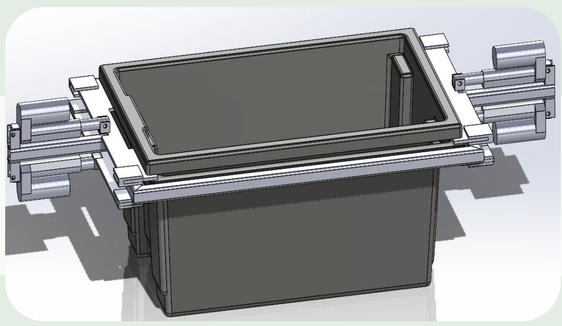
- Frame modified to support lifting, drive and collection systems.
- Transport features integrated for practical nursery operation





Collection System

- Conveyor transfers lifted seedlings directly into boxes.
- Boxes are dispensed from a stack by the box dropper then move along a side mounted rollers and for continuous collection.



RESULTS

- Field Test 1: Successful lifting, chain vibration identified under load.
- Field Test 2: Successful integrated operation.
- Best motor flow was 20 L/min, 110 rpm, producing reliable seedling lifting with a 87% success rate for field test 2 under unfavourable soil conditions.

OUTCOMES & NEXT STEPS

- Four row proof of concept successfully demonstrated.
- Hydraulic lifting, collection and trailer systems integrated.
- Next steps: eight row expansion, extended durability testing, road legal trailer approval and commercialisation.







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