Performance of an Active Watering System for Veggie

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Veggie – Experimental system

• Platform for food production experiments - 0.25 m²
• Uses a Passive Watering system
Food Production

• Large Scale – Scale from Experimental to Production
  • 50 g salad per day for Crew = 6
  • 1 m² Planting area

• Performance criteria:
  • Productivity – maximal
  • Consistency – repeatable
  • Crew Time - minimal
Veggie - Performance

• Productivity
  • Not optimal
  • Edible

• Inconsistent
  • Hard to control delivery rates in 0 g
  • Uneven germination – water stress

• Crew Time
  • Hand watering
Active Watering System for Veggie

• Uses power – 10 W
• Automated operation - Water on-demand
• Additional resources – Laptop, sensors, pumps
• How robust is the system?
• Can it be scaled?
Pillow Assembly
Pillow Assembly
Pillow Assembly
Planting
Chamber Study
Results
Productivity

Germination - 100%
Head Mass - 40 g Fresh Weight
    Hydroponic - 80-100 g
    Veggie - 25-30 g
Power Use - 10 W continuous
Conclusions

• Active system was built and tested
• Issues – handling leaks, refilling water bag
• Performance
  • Higher productivity than Veggie – not optimal
  • Reliable – all plants germinated
  • Crew time - minimal