UAV Software – Simulation Notes:

* Using the dimensions of the AGRAS MG-1 for size reference
  + <https://www.dji.com/mg-1/info>
* Size of UAV in simulation is 4.83ft x 4.83ft x 1.58ft (1unit x 1unit x 0.33unit when to scale)
* In the simulation, 1 unit scale is equal to 4.83ft (rounded up to the second decimal place)
* The mesh representing the field will be the average size of a farm in the United States in 2017 – 444 acres
  + https://www.statista.com/statistics/196106/average-size-of-farms-in-the-us-since-2000/
* 1 acre in the field will have the dimensions 660ft x 66ft (136.65unit x 13.66unit when to scale)
* The UAV will plant the seeds 2.46ft apart from each other both column and row-wise (0.51unit when to scale)
  + Number taken from <http://www.fao.org/ag/ca/africatrainingmanualcd/pdf%20files/03fiel1.pdf>
  + Seeds will also be planted 2.46ft (0.51unit) away from the edge of the field
* 136.13unit worth of planting space in a column without edges, 267 seeds will be planted per column (rounded down from 267.29)
* 13.17unit worth of planting space in a row without edges, 25 seeds will be planted per row (rounded down from 26.83)
* The UAV is capable of lifting 22.04 lbs. max
  + Simulation will use a seed weight of 0.000110231lbs. (50 mg)
    - Weight taken from <https://www.agric.wa.gov.au/grains-research-development/wheat-seed-weight-differs-between-varieties>
    - Indicates about 9,071 seeds per lb.
  + Implies the drone can lift 199,943 seeds at once
  + Based off this\* site, the simulation will aim to plan 600,000 seeds per acre, which amounts to 60 lbs. per acre
    - \* <https://www.no-tillfarmer.com/articles/5083-use-seed-size-for-a-better-seeding-rate>
  + The UAV will deposit 89 seeds per planting marker
* The UAV’s max operating speed is 26.2467 ft/s
  + Results in about 5.43 unit/s in the simulation
  + General travel speed will be 5.43 unit/s
  + Planting speed will be 2.5 unit/s
* In the simulation, 1 acre of field is approximately 1864.59 unit^2. The AGRAS MG-1 can allegedly cover about 53,819.55 ft^2 (11,142.76 unit^2) in a single charge, which is about 5.98 acres worth of field
* The UAV should use approximately 17% of its battery life per field
* Based on this\* information, we’ll assume it takes approximately 4.5 hours to charge from 10% to 100%
  + https://www.quora.com/How-much-time-does-a-12-000-mAh-power-bank-take-to-charge