Fruit Fly Assignment

Introduction

Methods

1. Important characteristics of fruit fly spread?
2. Simulation model structure
   1. Fruit fly population estimates
   2. Location and Distance between trees
   3. Introduction risk map
   4. Dispersal kernal (probability density function) -
3. Simulations ran
   1. Different surveillance methods – Triska et al had a table
      1. Standard Grid pattern
      2. Reduced Grid pattern (25 traps)
4. Comparisons between
   1. Time to detection
   2. Etc
   3. How they were compared (K-S Test)
      1. Triska compared all to the ‘standard’ strategy (grid)

Results

99% worst case = 108 days detected by in 99% (lure =20)

90% worst case = 88 days detected by (lure 20)

Table 1: Comparison with standard grid pattern - whole distribution – K-S test

|  |  |  |
| --- | --- | --- |
| Surveillance Method | Significance *p* |  |
| Reduced Grid | < 0.001 |  |
| Random 1 | = 0.004558 |  |
| Random 2 | < 0.001 |  |
| Random 3 | < 0.001 |  |
| Expert 1 | < 0.001 |  |
| Expert 2 | <0.001 |  |
| Efficient | <0.001 |  |
| Inefficient | 0.1205 |  |

Table 2: Comparing means

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Surveillance Method | Mean Time (+/- SD) | Mean Trees +/- SD | Compared to Standard Grid (Tukey, Time) | Compared to Standard Grid (Tukey, ntrees) |
| Efficient | 71.655 (10.886) | 32.399 (53.62827) | 0.0016 | 0.4597 |
| Expert 1 | 81.426 (13.955) | 28.617 (25.84307) | <0.0001 | 0.9999 |
| **Expert 2** | **56.558 (13.16320)** | **14.672 (34.04040)** | **<0.0001** | **<0.0001** |
| Inefficient | 69.012 (11.58551) | 25.565 (44.67881) | 0.995 | 0.9718 |
| Random 1 | 67.941 (10.90626) | 24.505 (42.32478) | 0.101 | 0.794 |
| Random 2 | 71.093 (11.30682) | 31.612 (52.47034) | 0.063 | 0.717 |
| Random 3 | 71.028 (11.42198) | 31.907 (51.6494) | 0.089 | 0.623 |
| Reduced Grid | 83.903 (13.69683) | 46.802 (64.15270) | <0.0001 | <0.0001 |
| Standard Grid | 69.472 (11.42198) | 27.924 (45.05241) | 1 | 1 |