

Growth of Mayapples Over 9 Years

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Introduction:

In 2008, a restoration project was enacted at Calvin College near the Burton street entrance. Lawn turf was restored to native forest, and six test quadrats were planted in order to test success rates of restoration. The herbaceous species *Podophyllum peltatum* (Mayapple) was planted in these test quadrats as restorative ground-cover. The *Podophyllum* had the highest survivorship rate initially. Data was collected on area of clonal propagations and stem count in 2015. Our study furthers this data collection with an accurate area measurement, stem counts, and interpolation of data from 2015. Looking into the study, we set out to determine a possible rate of growth of the mayapples over the nine-year period since the first study that they were planted in.

Methods:

Each of the six quadrats was flagged at every meter creating an 8x8 meter square. Opposite flags were connected by string to create a 64 sq. meter grid. Within the square meters we mapped out each mayapple clone based on their location in the string grid. Following this, we did a stem count for the clones, marking each stem to prevent error in counting. The maps were input into ArcGIS for record keeping and to calculate area. From the known areas and stem counts of both the 2015 and 2017 maps we could calculate the density of the clones as stems/sq. meter.

Results:

For each different plot, a range of 21 to 96 stems were added on average between the 8 different clones in each individual quadrat. Many of the mayapple clones merged together over years of growth into larger clones, making it difficult to distinguish the origin of each mayapple clone from the original mayapples planted. For all plots, the average increase in stems was 47 stems per plot, but the density of each mayapple clone increased by 4.4 stems/sq. meter, reflecting that mayapple clones may get denser as they grow older. Even as mayapple clones add stems, they add them closer together rather than expanding at a constant density. The rates of growth of clones can be obtained in the future with more data points. From our three data points on original 2009 planting, 2015, and 2017, no discernable pattern of growth was observed. The rate of growth on average was 9.102 stems/year with a standard deviation of 2.02 stems between the quadrats.

Reflection:

This experience has been an absolute pleasure as I work in creation with fellow biology majors to look into the restoration of the environment surrounding Calvin College. Working under a professor such as Dr. Warners has taught me how to collaborate with superiors, and how to take the knowledge of class into the field. From plants, to ecology, to discussing possible genetic variations, this project and summer has been a joy.