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BIO

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Appendix A. The Farmers' Problem

To the right is a hypothetical diagram of a farmer's field that is surrounded on three sides by different forest stands. Below the diagram are illustrations of the species of trees (and their seeds/cones where applicable) and the annual goldenrod.

Assume that each of the forests (A, B & C) are at least 40 years old. It is also safe to assume that there are no other mature species of trees in each of the forests other than those given under the forest headings. Each forest does contain occasional seedling trees (approximately 6 to 18 inches tall) of various species, and each of the forests contains stumps from the cuttings of many years past.

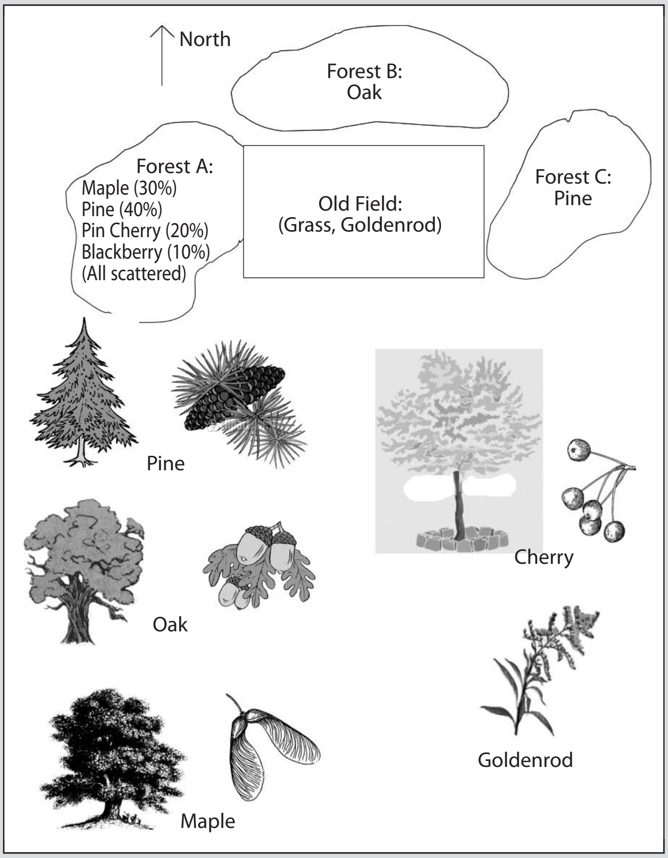
The farmer decides to harvest his pine field (Field C). This is accomplished by literally sawing the mature trees (largely the entire forest) by cutting them at the base, thereby leaving stumps behind from which new sprouts may possibly grow (a practice that was commonly done to start tree growth).

Many years pass, and the farmer (or perhaps his/her children) notice that what was once a pine forest in Field C has now become principally an oak forest.

Farmers with other similar plots also notice that in those instances where oak fields were harvested for lumber (like the original Field B), they were eventually replaced by pine trees.

Using the information below in the table and the diagram and illustrations to the right, I want you to come up with various explanations to account for the farmers' observations. (Where did the oak trees that took over the harvested field [C] come from?). You may decide that much of the information in this table is not useful for now. You may also decide that you need more information for one or more of your explanations. That is fine – make note of any questions that you may have. Consider as many explanations as you can, even those that may seem unusual.

Also: How might someone from the 19th century, who believes in the divine creation of life, explain what is occurring in the fields?



Species	Avg. Height	Growth Rate	Avg. Age When Capable of Reproducing	Seed Dispersal	Optimal Seedling Light Conditions	Adult Shade Tolerance	Life Expectancy (Years)
Oak	80′	Slow	10 years	Acorns (Heavy) – Drop & Critter	Low Light	Moderate	80 - 100
Pine	60′	Slow	10 years	Cones (Seeds) Wind	Mod. Light	Moderate	50 - 60