



**CALIFORNIA STATE SCIENCE FAIR  
2007 PROJECT SUMMARY**

<b>Name(s)</b> Steven M. Bowman	<b>Project Number</b> <b>J1703</b>
<b>Project Title</b> <b>Plant Populations and Seedling Growth</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective was to test various seedling populations of two different crops to find the best plant growth for the farmer using the least amount of nursery space. Onion and spinach are used in this experiment because they are important crops, they grow well in the winter season and they are very different types of a crop from each other. <b>Methods/Materials</b> 200 cell seedling trays were filled with growing medium. Depressions were made in each cell and seed was placed in the depressions. Populations of 1, 2 and 3 seeds per cell was used for each type of seed. This process was repeated until there were three replications each for both the onions and spinach. The trays were topped off with growing medium, placed in a greenhouse and watered everyday. Fertilizer was added to the water every third day at the same rate for all trays. After thirty days, plant weight and total plant mass was recorded. In addition, the plants were examined and compared against the ideal transplant characteristics. <b>Results</b> The onions had little or no individual seedling size reduction over all the populations so could be successfully grown at higher populations while using space more efficiently. Total mass for the spinach increased as the populations were increased however mass per plant dropped rapidly at 2 and 3 plants / cell. Thus for spinach the best quality transplant was produced at 1 plant per cell. <b>Conclusions/Discussion</b> I conclude that with a plant like onion having adventitious roots and upright growth, the best results were at higher plant populations thus a farmer can grow more onion seedlings in less greenhouse space. For spinach, single plants / cell were the largest and best. At higher populations the individual spinach seedlings were smaller, the roots were entangled and the leaves easily damaged.	
<b>Summary Statement</b> Testing various seedling populations of Onion and Spinach to find the ones best suited to the farmer.	
<b>Help Received</b> Used greenhouse and scales at father's work.	