CAN PUMPKINS BE GROWN FOR SNACK SEED PURPOSES IN THE TREASURE VALLEY?

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Introduction

Pumpkins (*Cucurbita pepo)* grown for their seed for use as a snack product appear to be a growing market. Pumpkin seeds are a healthy and popular food option (Rubatzky and Yamaguchi 1999). Recently, attention has been focused on the growing market of ready-to-eat (RTE) snacks such as dried and seasoned pumpkin seeds (Brennan et.al 2012). This trend is expected to continue to grow for at least the next 5 years. Conversations in the spring of 2014 with Oregon Department of Agriculture Trade Specialists indicated that Oregon may be positioned to help supply an increasing need for pumpkin seeds for companies that need to import their supplies from overseas.

Companies that have indicated interest in purchasing seed in this area would prefer that they be raised organically.

The agricultural region of northern Malheur County features a long, arid growing season that enables many crops to grow well under irrigation. Many types of jack-o-lantern and giant pumpkins have been grown with success in small commercial plantings (Shock and Shock 1986, Shock et al. 1996). Prior success with conventional pumpkins leads to the belief that pumpkin varieties with hulless seeds could also be grown successfully. Small amounts of commercial pumpkin seed varieties were planted in 2014 at the Oregon State University, Malheur Experiment Station to observe if pumpkins grown for seed would finish their reproductive cycle in the Treasure Valley.

Pumpkins require 4-5 five years between crops to alleviate disease pressure so this alternative crop would be a quality fit into the rotation of this intensely cropped region. Fusarium wilt, powdery mildew, and squash bugs are some of the pest issues that are mitigated in part by a long crop rotation. Pumpkins grow best in soils with a pH of 6.5 to 7.5 (Rabatzky and Yamaguchi 1999) and that encompasses much of the Malheur County growing region.

Project Goal

The hypothesis of this proposal is that varieties currently available for pumpkin seed production could be produced competitively in Malheur County, providing another crop alternative for producers while filling a need for product in an emerging market.

Material and Methods

Small, observational plots of five cultivars were planted at the Malheur Experiment Station, Ontario, Oregon during the 2014 growing season. Plot size was one row with the length determined by the amount of available seed. The rows were spaced 1.5 m apart. Plants were spaced 30 cm in-row. The trial was drip-irrigated. A soil test taken prior to planting showed that the upper layer of soil had a pH of 4.6 due to a heavy sulfur application in the past. The seeds were planted between 15 May and 2 June and harvested on 10 October. The observation plots were monitored for insect activity and disease incidence.

Harvest consisted of knocking the pumpkins off the vine and rowing them. They were weighed, measured, and the seeds were removed on 14 October. At harvest, a final count of pumpkins per plot was taken. A subsample of 10 pumpkins per plot was then taken to determine individual size and weight. After the manual removal of seeds, the seeds were weighed wet and then dried in a forced-air drier and then weighed. This allowed the calculation of weight loss along each step to provide a value of dried, cleaned pumpkin seed per pumpkin.

Results and Discussion

Four of the five entries exceeded 8% of total weight in seed per pumpkin (Table 1). The entry 'VNS Hulless' produced the lowest ratio of seed to total pumpkin weight, 4.4%. This entry also had a significant amount of sprouted seed inside the pumpkin at harvest. Some coleoptiles as long as 1.75 inches were observed. Given the low proportion of seed and seed sprouting issues, this cultivar will not be included in future evaluations. The remaining four cultivars all showed potential for adequate yield with JSS 44014 and JSS 32713 both exceeding 10% of total fruit weight in seed production. These two cultivars will be included in the 2015 study.

Disease and insect problems identified included squash bugs (*Anasa tristis*), Fusarium, powdery mildew, and squash mosaic virus. The squash mosaic virus is believed to be seed borne. *Fusarium solani* was diagnosed by the Oregon State University Plant Diagnostic Service. Powdery mildew was observed on the foliage late in the season and may have been late enough to not influence production. The development of a reliable treatment program for squash bugs that would meet the Organic Materials Research Institute (OMRI) will be necessary. Squash bugs provide a significant threat to the success of pumpkin production in this region.

Further trials will be conducted based on the results of the first season using larger replicated plots to provide reliable estimates of seed yield and quality. If pumpkins for seed production do prove viable, the next step will be to determine how the raw product will then be washed and dried prior to marketing. It is believed that seeds need to be washed and dried within 4 hours of harvest before they will start to stick together and "brick-up" in their holding container. Seeds are not considered to be marketable once they "brick-up". The continuation of this project could eventually result in a new processing facility for pumpkin seeds in Malheur County, which would create jobs and enhance the local economy.

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Table 1. The yield results of observational plots of five pumpkin cultivars grown at the Malheur Experiment Station, Oregon State University Ontario, OR in 2014.

Entry	Avg. number of pumpkins/plant	Avg. pumpkin diameter (in)	Avg. seed weight per/plant (oz)	Percent weight as seed
VNS hulless	2.5	7.93	4.3	4.4
JSS 44014	9.3	6.23	19.7	13.8
JSS 32713	13.0	5.90	25.7	12.7
JSS 32613	10.0	7.28	16.8	9.6
JSS 32513	11.5	6.28	14.9	8.2