

Development of Adzuki Bean Crop in the Columbia Basin

Lian Moy, Ruijun Qin, & Shahram Torabian

Oregon State University – Hermiston Agricultural Research & Extension Center, Hermiston, OR 97838

INTRODUCTION

- Current rotational crops (wheat, corn) yield limited profit for some farmers due to the changing and competitive market (both domestic and international).
 - This has interested growers in finding a new, high value, rotational crop.
- Adzuki bean (*Vigna angularis*) is a small, but plump, red bean. They have a high export demand in East Asia and are commonly used for desserts as anko, or red bean paste (Lumpkin et al., 1993).
- With the introduction of adzuki beans in the Columbia Basin, it may increase growers' profits while also improving soil health through nitrogen fixation, conserving water usage, suppressing pests/diseases, and by offering more crop diversity.

MATERIALS/METHODOLOGY

- Field trials are being conducted at the OSU-HAREC April 2019 - September 2021

Planting:

- Pre-emergence herbicide & soil tilling
- Different adzuki bean varieties
- Varying planting dates
- Different planting configurations

Growing:

- Post-emergence herbicide
- Manual weeding
- Plant growth, plant height, blooming date recorded

Harvest:

- Bean production yield & shoot dry biomass recorded
- Stand count, seed size, pod per plant analyzed w/ ANOVA



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OBJECTIVE

In this ongoing study, the agronomic management practices such as planting configuration, varieties, irrigation, and pest management practices for the adzuki bean crop are studied and developed to provide insight on successfully producing dry adzuki beans to growers in the Columbia Basin.

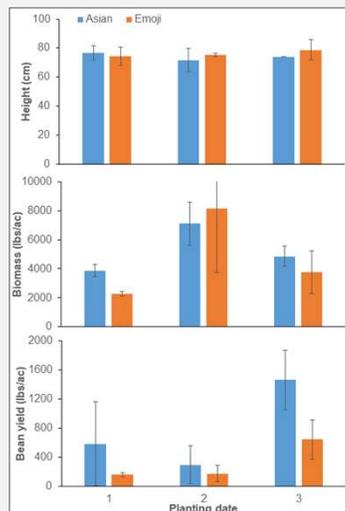


Figure 1. The height, biomass, and bean production of two adzuki bean varieties as affected by different planting dates (May 4, May 22, and June 9, 2020).



Mung bean plant with mature pods at HAREC (photo by L. Moy)

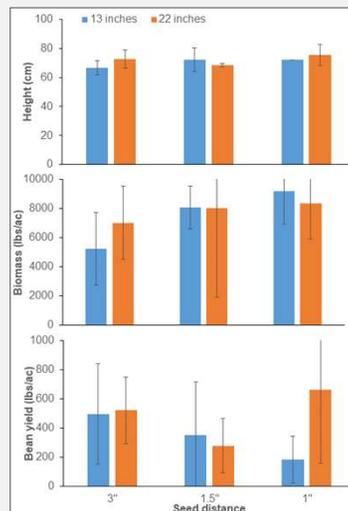
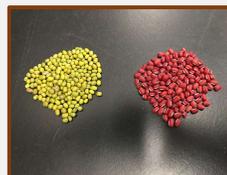


Figure 3. The height, biomass, and bean production of adzuki bean (Emoji) as affected by different seed distances (1, 1.5, 3 in.) and row space (13 vs. 22 in.) in the 2020 field trial.



Adzuki bean plant with mature pods at HAREC (photo by L. Moy)



Mung beans (left) and adzuki beans (right) (photo by L. Moy)

RESULTS & DISCUSSION

- 7 promising red-colored varieties from the USDA germplasm.
- Optimal planting date: early summer
 - Warmer soil helps promote plant growth and reduce weed pressure.
 - However, higher potential to experience frost before harvest (Fig. 1).
- Plant biomass and bean production yield varies between different varieties.
- Optimal plant configuration:
 - Seed distance: close (1") for helping secure plant stature as a seedling.
 - Row spacing: wide (22") for more opportunity to receive sunlight and airflow (Fig. 3).
- Adzuki beans are a relatively high source of protein, vitamin B6, magnesium, and iron, compared to other crops grown in the Columbia Basin.
 - Successfully incorporating adzuki beans in the crop rotation may provide the population with an inexpensive source of protein. This may result in increasing demand for the crop, increasing growers' profit.
- Weed pressure is the most challenging factor that impacts plant growth and production.
 - Pre- and post- emergence herbicides, manual weeding, and/or weeding tool operations are recommended.
- Mung bean may be a suitable crop to further study in the Columbia Basin.
- Possible future study: comparing nutrient contents of several adzuki bean varieties to possibly development different purposes for different varieties.
- More solid results will be created at the end of the study (Sept. 2022).

References

Lumpkin, T.A., J.C. Konovsky, K.J. Larson, and D.C. McClary. 1993. Potential new specialty crops from Asia: Azuki bean, edamame soybean, and astragalus. p. 45-51. In: J. Janick and J.E. Simon (eds.), New crops. Wiley, New York.

