

Alfalfa Genetic Diversity in Plant Height and Yield

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INTRODUCTION

- Alfalfa (*Medicago sativa* L.) is the queen of forages with very diverse genetic background in lots of phenotypic characteristics.
- Alfalfa plant height and yield are the most important characteristics in breeding programs and general agricultural management practices.

OBJECTIVES

- Quantify alfalfa plant height and yield variability of the 200 alfalfa entries seeded in 2018.
- Study the relationship between alfalfa plant height and yield.

METHODS

- We monitored 200 entries alfalfa plant height and harvested them to measure alfalfa yield (Figure 1) four times in 2021.



Figure 1: Harvesting first cut alfalfa (photo by K. Ortiz)

DISCUSSION

- Alfalfa has the genetic diversity that is manifested in the phenotypic characteristics such as plant height and yield. This genetic diversity presents the potential for forage yield improvement through breeding programs. Different alfalfa entries can produce forages with a magnitude of 9 ton/acre per year differences.
- Alfalfa plant height can have significant effect on stem-to-leaf ratio, which affects alfalfa forage quality. The plant height of alfalfa varies and does not correlate to the yield significantly. Therefore, a dwarf alfalfa type can produce high yield with less lodging and higher forage quality.
- We focused on alfalfa plant height and yield field evaluation at Eastern Oregon Agricultural Research Center at Union. The forage quality and genetic makers results will be available soon.

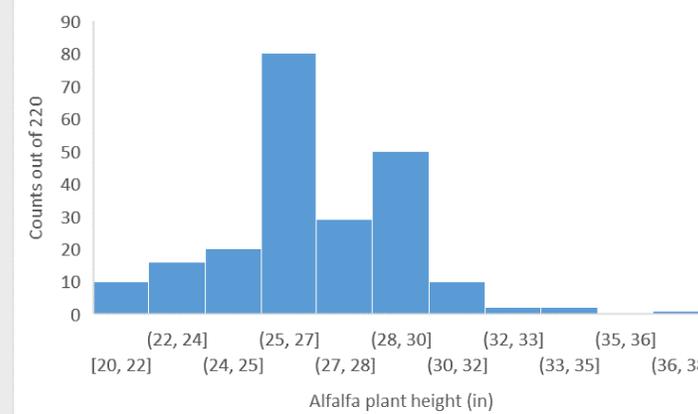


Figure 2. Alfalfa height (in) distribution in the first cut

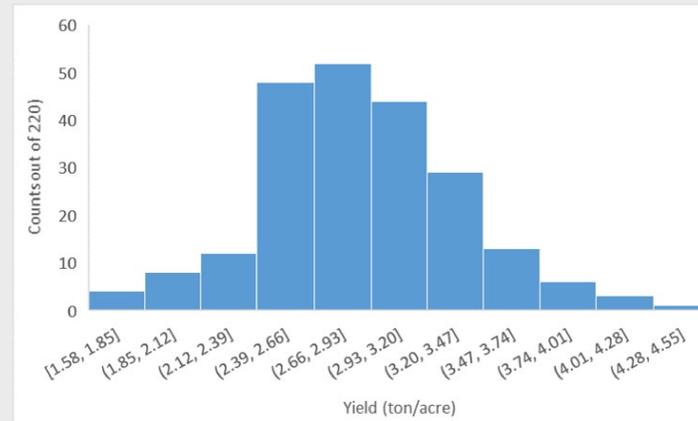


Figure 3. Alfalfa yield (ton/acre) distribution in the first cut

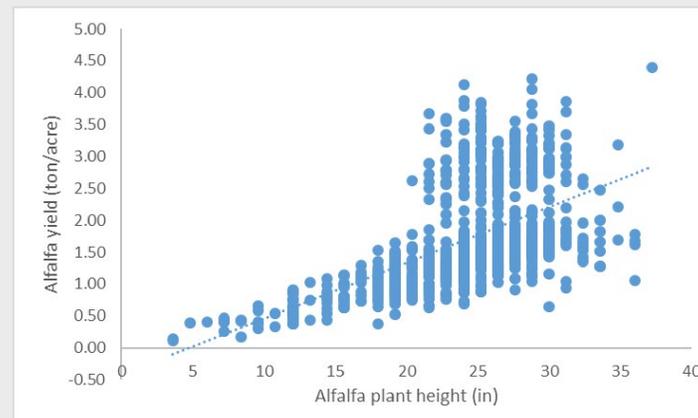


Figure 4. The relationship between alfalfa yield (ton/acre) and plant height (in) in all four harvests



Figure 5. Alfalfa samples for genetic analysis (photo by M. Waite)

RESULTS

- Alfalfa plant height varied from 20 to 38 inches for the first harvest (Figure 2), from 10 to 35, 16 to 36, and 4 to 36 inches for the second, third, and fourth harvest, respectively.
- Alfalfa yield varied from 1.58 to 4.55 ton/acre for the first harvest (Figure 3), from 0.33 to 2.26, 0.77 to 2.19, and 0.11 to 1.70 ton/acre for the second, third, and fourth harvest, respectively.
- Alfalfa height is not a good parameter to predict the alfalfa yield in general (Figure 4).

ACKNOWLEDGEMENTS

We acknowledge the College of Agricultural Sciences Branch Experiment Station Internship Program for its financial support and leadership. We also thank the other students and employees that helped to make this project possible.