

## CAN LESS BE MORE – HOW MUCH ALFALFA SHOULD I BE SEEDING AT ESTABLISHMENT?

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### Introduction

The alfalfa seed industry has introduced coated seeds over the last decade to improve establishment of alfalfa seedlings. These coatings can be light or heavy but are still sold in 50 pound bags. As a result, farmers are getting less **Pure Live Seed (PLS)** in a bag; while these coatings may enhance each individual seed's ability to establish successfully, it does reduce the total number of seeds in a bag when purchased by weight. Rhizobium bacteria, fungicide, colorant and polymers that bind the material are the most common constituents of "coated" seeds. Due to these changes, farmers have been asking UW-Extension educators *"What seeding rate should we be using to maximize our plant establishment?"*

The most recent alfalfa seeding recommendations for the upper Midwest suggest that farmers should not be planting less than **10 pounds of pure live seed (PLS)** per acre to maximize plant establishment and overall yield. In contrast, industry recommendations often exceed those of the Midwest resulting in > 12 pounds of PLS per acre. As Wisconsin harvests approximately 1.25 million acres of alfalfa each year, the need to provide efficient and effective alfalfa seeding rate guidelines are critical.

The UW-Extension Team Forage Wisconsin Alfalfa Yield and Persistence (WAYP) project (2007-2016) has revealed that most Wisconsin farmers are planting alfalfa at rates of 15-17 pounds of seed per acre at the time of establishment regardless of the amount of coating or inert material (Wisconsin Alfalfa Yield and Persistence Program Summary Report, 2016). Seeding rates during the lifetime of the WAYP project show a range of 12 pounds per acre to 28 pounds per acre. So, with a range that wide, the question should be not how many pounds of alfalfa seed should I be planting, but, instead, *"How many pounds of PLS alfalfa should I be seeding at establishment?"*

A typical 15 pounds/acre seeding rate would result in approximately 75 seeds/square foot. Previous work done examining alfalfa seeding rates revealed that once emergence is complete in three to four weeks, only approximately 50-70 percent of those seeds planted will have established as seedlings, leaving us with approximately 45 plants/square foot. Another 40-50 percent of those plants will no longer be present by the following spring, resulting in approximately 25 plants/square foot heading into the first full production year.

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## Response

In an effort to help farmers answer the question about alfalfa seeding rate recommendations a UW-Madison/UW-Extension Badger Plot Survey was developed. Members of the UW-Extension Team Forage Agronomy Workgroup recruited farmers in their respective counties across Wisconsin to participate in a statewide effort to collect on-farm data and track alfalfa plant and stem counts over the life of a newly established stand of alfalfa from beginning to time of rotation. The effort enlisted the help of county agents tracking alfalfa fields in Calumet, Chippewa, Clark, Outagamie, Shawano, and St. Croix counties. Agents and educators were able to measure how many plants emerged and survived. Farmers were using different seeding rates with both coated and non-coated products which resulted in a diverse set of data measuring how the number of alfalfa plants and stems diminishes over time.

The experimental design that was developed asked each participating farmer to seed their alfalfa fields according to their own existing production practices. The partnering UW-Extension agent/educator was responsible for collecting a range of information from each field. In this presentation we will report on the *Seeding Rate (in PLS)*, *Plant Stand Counts measured in the spring and fall each year*, and *Plant Stem Counts measured in the spring and fall each year*.

## Results and Discussion

Participating farms reported alfalfa seeding rates of 12.5 pounds per acre to 22.5 pounds per acre. When converted to PLS the range was 8.8 to 17.8 pounds per acre for alfalfa fields across the state. The objective of this effort was to determine whether or not alfalfa seeding rates above the upper Midwest recommendation of 10 pounds PLS per acre result in any significant difference in plant and/or stem counts during the life of the stand.

Figure 1 illustrates the number of alfalfa plants measured per square foot in the fall of the second full production year across three different PLS seeding rates. After analysis, no significant differences ( $P=0.23$ ) were noted between plant counts at the PLS seeding rates identified.

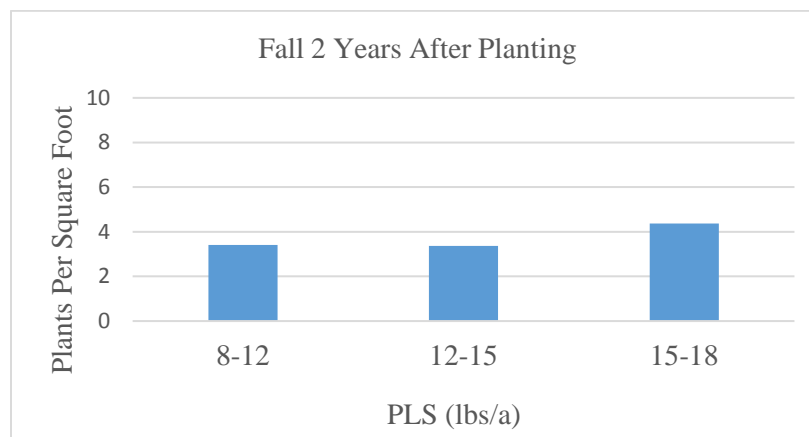


Figure 1

Stem counts are often used to determine whether or not an alfalfa field will produce an economic yield for the season. The number and size of stems often determine a field's productivity over a growing season. Figure 2 illustrates the number of alfalfa plant stems measured per square foot in the fall of the second full production year across three different PLS seeding rates. After analysis, no statistically significant differences ( $P=0.15$ ) were noted between plant stem counts and the PLS seeding rates identified.

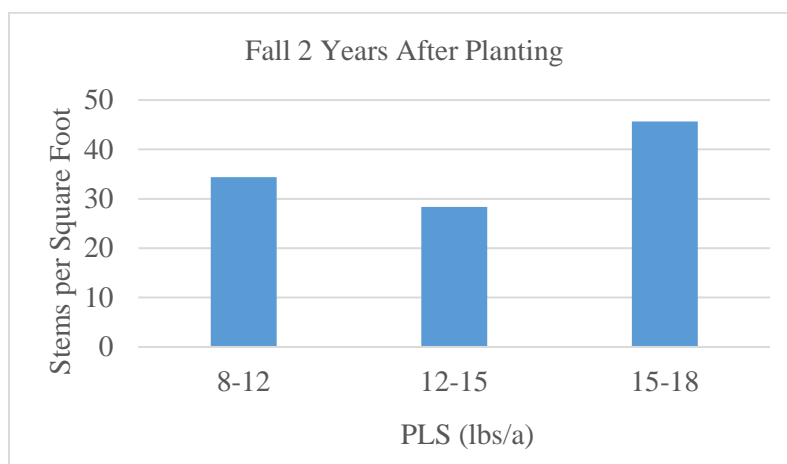


Figure 2

#### References

Bertram, M., and Cavadini, J. 2016. Wisconsin Alfalfa Yield and Persistence (WAYP) Program 2016 Summary Report. UW-Extension Team Forage and Midwest Forage Association. 2-3.