**Seeding Rate Study 2016**

Steve Lyon WSU Bread Lab

The correct seeding rate for small grains in the maritime environment of northwestern Washington has been an unanswered question for area grain growers. The Plant Breeding Program of the WSU Bread Lab has been planting wheat at approximately 100 lbs/acre, but even that has been a “best guess” of what the optimum seeding rate should be. In the fall of 2015 we conducted a winter wheat seeding rate study using 26 seeds per square foot as the base rate, as recommended by the Washington State Crop Improvement Association (WSCIA) for high precipitation areas. Seven of the area’s top yielding hard and soft winter wheats were planted at five different seeding rates, replicated four times and grown under common agronomic practices.

Seeding rate, based on seeds per square foot, is calculated as follows:

1. Determine the seeds/pound of your current seed lot;
	1. Count the number of seeds in one pound of seed or
	2. Count 1000 seeds, weigh and convert to seeds/pound. Using Cara winter wheat (1000 seeds = 37.6 grams) as an example:

(1000 seeds/37.6 grams) x (454 grams/pound) = 12,074 seeds/pound

1. If you know your desired seeding rate in seeds/square foot, convert your current seed lot to adjust for the seed size:

(26 seeds/sq. ft.) x (43,560 sq. ft./acre) x (1 pound/12,074 seeds) = 93.8 pounds/acre

1. To determine seeds/ sq. ft. based on your current seeding rate:

(93.8 pounds/acre) x (12,074 seeds/pound) x (1 acre/43,560 sq. ft.) = 26 seeds/sq. ft.

In the field, it is easiest to check a drill’s seeding rate by converting seeds/sq. ft. to seeds/linear foot of drill row as follows:

1. To convert seeds/sq. ft. to one linear foot of drill row:

(drill’s row width in inches) x (1 foot/12 inches) x desired seeds/sq. ft. = seeds per linear foot, i.e.

(6 inches) x (1 foot/12 inches) x (26 seeds/sq. ft.) = 13 seeds per linear foot

 The chart below shows the varieties used in our seeding rate study, 1000 kernel weight (KWT) and the yields harvested (highest in bold) at the various seeding rates:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variety | 1000 KWT | Yield (bu/ac) at seeding rate percentage of 26 seeds/sq. ft. |  |  |
| **4 reps** | **grams** | **60%** | **80%** | **100%** | **120%** | **140%** | **CV %** | **LSD@5%** |
| Cara | 33.0 | 108 c | 140 ab | 125 bc | 153 a | **157** a | 10.4 | 21.5 |
| Skagit 1109 | 36.2 | 108 b | 141 a | 130 ab | **146** a | 129 ab | 14.7 | 28.9 |
| Madsen | 36.2 | 72 b | 90 a | 94 a | **100** a | 89 a | 11.5 | 15.4 |
| Norwest 553 | 40.4 | 132 c | 143 bc | 145 abc | **166** a | 160 ab | 10.4 | 23.5 |
| LCS Colonia | 43.2 | 155 a | 160 a | 162 a | **185** a | 178 a | 13.6 | 34.7 |
| Bobtail | 39.1 | 156 b | 167 ab | 167 ab | **185** a | 167 ab | 8.0 | 20.3 |
| SAS W4 | 42.0 | 99 d | 125 c | 135 bc | 144 ab | **155** a | 9.6 | 19.0 |

|  |
| --- |
| * means with the same letter within a variety are not significantly different
 |
| * all test weights within a variety were not significantly different
 |  |  |  |  |

The results of the 2015/16 winter wheat seeding rate study indicate that for most of the varieties trialed the 120% seeding rate resulted in the greatest yield. This means that one should use a seeding rate of 31-32 viable seeds per square foot to achieve the greatest yield potential. A 140% seeding rate would mean planting 36-37 viable seeds per square foot.

The seed size of a variety can change dramatically from year to year based on the environmental conditions where it was produced. It is important to determine the seed size of each variety one uses when calibrating a planter in order to achieve maximum yields.

This study will be repeated for the 2016/17 crop year.

For additional information contact Steve Lyon (slyon@wsu.edu).

For additional variety testing results visit: [http://thebreadlab.wsu.edu/western-washington-variety-trials/.](http://thebreadlab.wsu.edu/western-washington-variety-trials/)

The information in this document is provided for educational purposes only. References to commercial products or trade names do not imply an endorsement by Washington State University.