



Michigan Technical Note

USDA-Natural Resources Conservation Service

AGRONOMY #13

Subject: Plant Materials - Using Seed Package Label Information to Calculate Pure Live Seed (PLS) and Seeding Rates

Date: September 2006

INTRODUCTION

Seed quality is a primary consideration when purchasing seed for any agronomic, horticultural, or conservation planting. Seeds are available in many types of packages, quantities, and mixtures. Seed lots vary widely in quality. The key to getting the best quality is to look at the information on the seed package label. Federal and state seed laws require that each seed lot offered for sale must be truthfully labeled. The Federal Seed Act and the Michigan Seed Law (Act 329 of 1965) mandate that certain information be listed on a seed package label.

Information on the seed package label can be used to compare quality among seed lots. It is also used to determine the amount of pure live seed (PLS) that is present in the package. PLS information can then be used to determine how much seed per acre should be planted in order to achieve the desired seeding rate.

UNDERSTANDING SEED PACKAGE LABELS

Federal seed laws require the following information on a seed package label:

1. Variety and kind (cultivar/release name, species, and common name)
2. Lot number (a series of letters or numbers assigned by the grower)
3. Origin (where the seed was grown)
4. Net weight
5. Percent pure seed (purity - how much of the contents is the desired seed)
6. Percent germination (how much of the seed will grow)
7. Germination test date
8. Percent inert matter (how much of the contents is not seed)
9. Percent other crop seeds
10. Percent weed seeds (seeds considered as weed species)
11. Name of restricted noxious seed and number of seeds per pound in the package
12. Name and address of company responsible for analysis (seller or grower)

Example seed label:

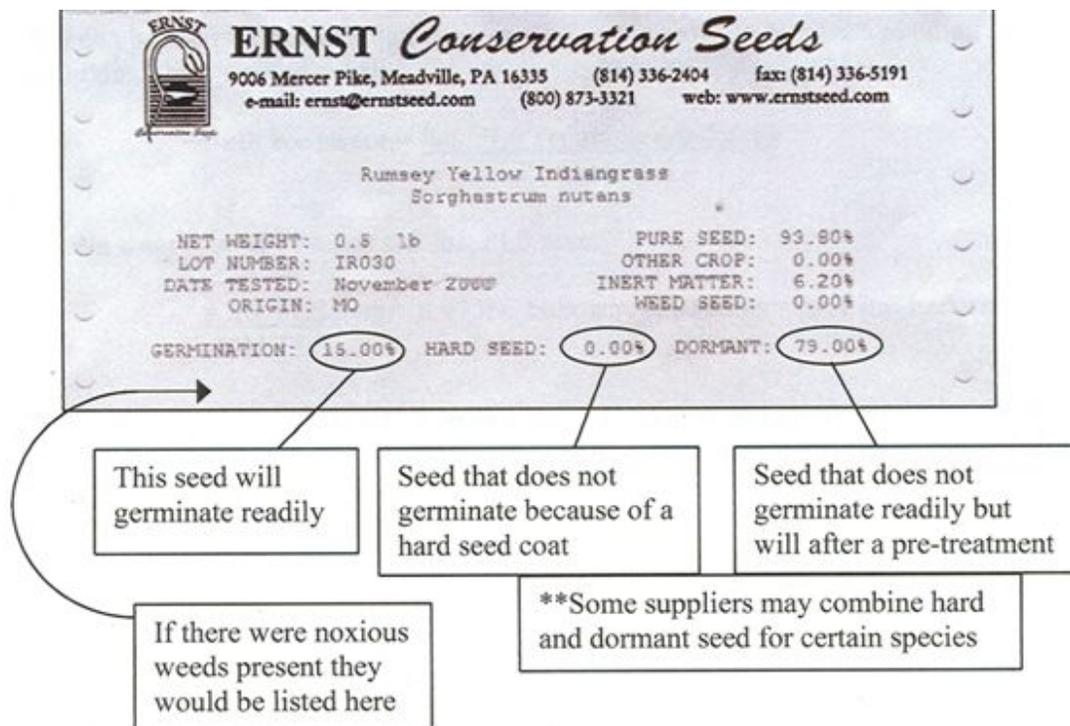


Figure 1. Seed package label showing all required seed information. (The use of this label is for demonstration purposes only. It is not intended as an endorsement of any seed producer.)

Variety and kind, lot number, origin, and net weight are all obtained from the grower or seller. The remaining information is obtained from the Seed Analysis Report, which is completed by an official seed testing laboratory (government or commercially operated). The seed lab performs a number of tests on a representative sample of each seed lot submitted to that lab. The tests are conducted under controlled conditions based on the “Rules for Testing Seed Adopted by the Association of Official Seed Analysts.”

PROHIBITED AND RESTRICTED NOXIOUS WEEDS

During the purity test, the seed sample is examined for the presence, and quantity, of restricted and prohibited noxious weed seeds. Each state has its own list of restricted and noxious weed seed. Restricted noxious weed seeds are allowed in seed lots offered for sale, but the amount of those seeds in the package is restricted. The restricted weed species name and number of seeds per pound of product must be listed on the seed package label. Prohibited noxious weeds are not allowed in any seed lot offered for sale.

USING SEED PACKAGE LABEL INFORMATION TO CALCULATE PLS AND SEEDING RATES

Seeding rate recommendations in the Natural Resources Conservation Service (NRCS) Standards are stated in amount of pure live seed per area planted (e.g., pounds PLS/acre). Information found on the seed package label is used to determine the amount of pure live seed in a package, and that information is then used to determine the bulk seeding rate needed to obtain the recommended PLS seeding rate.

Example #1 - Calculating PLS and bulk seeding rate for indiangrass.

Using the information in the seed package label in Figure 1, determine the PLS percentage in the seed lot.

Step 1: Determine total seed germination

$$\text{Total Germination} = \text{germination} + \text{hard seed} + \text{dormant seed}$$

$$\text{Total Germination} = 15 + 0 + 79 = 94\%$$

Step 2: Determine PLS percentage

$$\text{PLS \%} = \frac{\% \text{ Purity} \times \% \text{ Total Germination}}{100}$$

$$\text{PLS\%} = \frac{93.8 \times 94}{100} = 88.2\%$$

If the recommended seeding rate for indiangrass is 4 lb PLS/acre, how much of this seed lot is required to plant 1 acre?

$$\text{Bulk seed/acre} = \frac{\text{lbs PLS recommended/Acre}}{\text{PLS\%/100}}$$

$$\text{Bulk seed/acre} = \frac{4 \text{ lbs PLS/Acre}}{88.2/100} = 4.5 \text{ lbs bulk seed}$$

In addition to the mathematical formula listed above, Figure 2 is another tool available to estimate the amount of bulk seed required to achieve one pound of PLS.

% Purity	% Germination																		
	100	95	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10
100	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.6	1.7	1.9	2.0	2.3	2.5	2.9	3.4	4.0	5.0	6.7	10.0
95	1.1	1.2	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.0	2.2	2.4	2.7	3.1	3.6	4.3	5.3	7.1	10.6
90	1.2	1.2	1.3	1.4	1.4	1.5	1.6	1.8	1.9	2.1	2.3	2.5	2.8	3.2	3.8	4.5	5.6	7.5	11.2
85	1.2	1.3	1.4	1.4	1.5	1.6	1.7	1.9	2.0	2.2	2.4	2.7	3.0	3.4	4.0	4.8	5.9	7.9	11.8
80	1.3	1.4	1.4	1.5	1.6	1.7	1.8	2.0	2.1	2.3	2.5	2.8	3.2	3.6	4.2	5.0	6.3	8.4	12.5
75	1.4	1.5	1.5	1.6	1.7	1.8	2.0	2.1	2.3	2.5	2.7	3.0	3.4	3.9	4.5	5.4	6.7	8.9	13.4
70	1.5	1.6	1.6	1.7	1.8	2.0	2.1	2.2	2.4	2.6	2.9	3.2	3.6	4.1	4.8	5.8	7.2	9.6	14.3
65	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.4	2.6	2.8	3.1	3.5	3.9	4.4	5.2	6.2	7.7	10.3	15.4
60	1.7	1.8	1.9	2.0	2.1	2.2	2.4	2.6	2.8	3.1	3.4	3.8	4.2	4.8	5.6	6.7	8.4	11.2	16.7
55	1.9	2.0	2.1	2.2	2.3	2.5	2.6	2.8	3.1	3.4	3.7	4.1	4.6	5.2	6.1	7.3	9.1	12.2	18.2
50	2.0	2.2	2.3	2.4	2.5	2.7	2.9	3.1	3.4	3.7	4.0	4.5	5.0	5.8	6.7	8.0	10.0	13.4	20.0
45	2.3	2.4	2.5	2.7	2.8	3.0	3.2	3.5	3.8	4.1	4.5	5.0	5.6	6.4	7.5	8.9	11.2	14.9	22.3
40	2.5	2.7	2.8	3.0	3.2	3.4	3.6	3.9	4.2	4.6	5.0	5.6	6.3	7.2	8.4	10.0	12.5	16.7	25.0
35	2.9	3.1	3.2	3.4	3.6	3.9	4.1	4.4	4.8	5.7	5.8	6.4	7.2	8.2	9.6	11.5	14.3	19.1	28.6
30	3.4	3.6	3.8	4.0	4.2	4.5	4.8	5.2	5.6	6.1	6.7	7.5	8.4	9.6	11.2	13.4	16.7	22.3	33.4
25	4.0	4.3	4.5	4.8	5.0	5.4	5.8	6.2	6.7	7.3	8.0	8.9	10.0	11.5	13.4	16.0	20.0	26.7	40.0
20	5.0	5.3	5.6	5.9	6.3	6.7	7.2	7.7	8.4	9.1	10.0	11.2	12.5	14.3	16.7	20.0	25.0	33.4	50.0
15	6.7	7.1	7.5	7.9	8.4	8.9	9.6	10.3	11.2	12.2	13.4	14.9	16.7	19.1	22.3	26.7	33.4	44.5	66.7
10	10.0	10.6	11.2	11.8	12.5	13.4	14.3	15.4	16.7	18.2	20.0	22.3	25.0	28.6	33.4	40.0	50.0	66.7	100.0

Figure 2. Conversion chart for determining bulk seed required to achieve 1 lb PLS based on % purity and % germination. Source: Mississippi Planting Guide, June 1999.

To use this chart, simply cross reference the % Germination with the corresponding % Purity. Using the information from Example #1 above, 94% total germination would round to 95%, and 93.8% purity would round to 95%. Multiply the desired PLS (4 lbs/Acre) by 1.2 (from Figure 2). The result is 4.8 lbs of seed needed to plant 4 PLS lbs per acre. The difference between this result and the result in Example #1 is due to rounding.

REFERENCES:

Association of Official Seed Certifying Agencies. 1999. Genetic and Crop Standards Manual. Association of Official Seed Certifying Agencies, Boise, ID.

Michigan Seed Law, Act 329 of 1965. Regulation 715 - Seed Law Implementation. 2005.
<http://www.michigan.gov/printerFriendly/0,1687,7-125--11250--,00.html>.

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