TECHNICAL NOTES

U.S. Department of Agriculture Natural Resources Conservation Service

TN-PLANT MATERIALS – CA- 5 (Revision 2) **June 1999**

BASIC SEED DATA SUPPORTING NRCS VEGETATIVE GUIDES

The data presented in this Technical Note was used to prepare the new Vegetative Guide seeding rates in pounds of pure live seed (PLS) per acre. Seeding rates for conservation practices used in California that utilize vegetative plantings are listed in the Vegetative Guides for each of the 16 Major Land Resource Areas. Vegetative Guides needed by an NRCS Field Office can be found in Section II of the Field Office Technical Guide. All of the planting alternatives presented to clients should be based on rates obtained from the Vegetative Guides in the Field Office Technical Guide. In some cases, the rates may differ slightly due to the nature of the job but these should be discussed first with the appropriate discipline specialist or plant materials specialist.

Table 1 provides the best available information on the number of seeds per pound for California native grasses, native forbs and shrubs, other grasses and cereals, legumes, and other forbs and shrubs. The first scientific name is based on the 1993 edition of The Jepson Manual – Higher Plants of California. The indented scientific name represents the previous common or historical usage. Data was primarily obtained from the Journal of Seed Technology, Volume 6 Number 2 titled "Rules for Testing Seeds" published by the Association of Official Seed Analysts in 1986; Part 201 of the Federal Seed Act Regulation – "Seed Testing Regulations" published by the USDA Agricultural Marketing Service; USDA Agricultural Handbook 339 - Grasses and Legumes for Soil Conservation in the Pacific Northwest and Great Basin States; the 1948 USDA Yearbook of Agriculture-Grass; and from the California Department of Food and Agriculture's Seed Laboratory. Other data was obtained from University of California DANR Publication 3338 and USDA-NRCS California Plant Materials Technical Note 40.

Table 2 demonstrates the variability in seed weights from year to year and between seed grown in different parts of the state. The standard number of seeds per pound represents an average for that species or cultivar.

Table 3 demonstrates the variability in purity and germination between seed lots for the same species. The percent germination and the percent of hard seed in legumes in a seed lot varies from year to year due to climatic factors and storage conditions. The percent hard seed is discounted when we calculate the amount of pure live seed (PLS). This is why it is necessary to calculate the PLS based on the seed tag data for each bag of seed and seed lot.

Revised by Gene Bishop, Retired, Former Assistant Manager, Lockeford Plant Materials Center, Natural Resources Conservation Service, Lockeford, California and by Walt Bunter, State Agronomist, Natural Resources Conservation Service, Davis, California.

The number of seeds per square foot that would result from applying one pound of seed per acre can be calculated by dividing the number of seeds per pound by 43,560 square feet per acre. The number of seeds per square foot is used to calculate the seeding rates that provide the desired species composition and plant population.

Seeding rates in the new Vegetative Guides were calculated based on goals that varied from planting 20 up to 60 pure live seed (PLS) per square foot depending on the practice and seeding method.

Remember to adjust the seeding rates at the field site to plant the needed pounds of PLS.

Using the percent germination and percent purity data on the seed tag, PLS can be determined by the formula:

Percent PLS = (percent germination * percent purity) / 100

Adjusted Seeding Rate = (100 / percent PLS in the seed bag/lot) * specified lbs. of PLS/acre

EXAMPLE: If the specified seeding rate is 10 lbs. PLS/acre and the seed tag shows:

Purity: 95 percent
Germination: 79 percent (do not include the percent hard seed)

Therefore: PLS content of seed bag = 7505/100 = 75 percent

Adjusted Seeding Rate is: (Round to nearest lb./acre)

(100/75) * 10 lbs./acre = 1.333 * 10 = 13.33 lbs./acre **USE 13 lbs./acre**

Seeds per Foot of Drill Row

When a seed drill will be used, testing and calibration are needed to insure that the specified seeding rate is being applied. The required number of seeds per foot of drill row can be calculated using the following formula:

Seeds/ft. of Row = (**Adjusted Seeding Rate** in lbs./acre * Number of Seeds/lb.) / RF

RF = Row Factor - which represents the total feet of rows/acre
RF = 87,120 for 6 inch row spacing
= 74,488 for 7 inch row spacing
= 65,340 for 8 inch row spacing
= 57,935 for 9 inch row spacing
= 52,272 for 10 inch row spacing

TABLE 1. CALIFORNIA SEED DATA FOR SINGLE SPECIES

CALIFORNIA NATIVE GRASSES

COMMON NAME	SCIENTIFIC NAME	SEEDS/LB[1/]	SEEDS/SF[1/]
Barley			
California Barley	Hordeum brachyantherum ssp. californicum H. californicum	127,000 [2/]	2.9
Meadow Barley	Hordeum brachyantherum ssp. brachyantherum	100,800 [2/]	2.3
		78,670-153,680 **	
Bentgrass			
Spike Bentgrass	Agrostis exarata	5,896,800 [2/]	135.4
Bluegrass			
One-sided Bluegrass	Poa secunda ssp. secunda	1,046,960 [2/]	24.0
Pine Bluegrass	Poa scabrella		
Bromegrass			
California Brome	Bromus carinatus	103,680 [2/]	2.4
'Cucamonga'		32,720-220,190 **	
Mountain Brome	Bromus carinatus var. carinatus Bromus marginatus	63,500 *	1.5
Canarygrass			
Reed Canarygrass	Phalaris arundinacea	537,520 *	12.3
Deergrass			
Deergrass	Muhlenbergia rigens	6,000,000	137.7
Dropseed			
Alkali Sacaton	Sporobolus airoides	1,758,000 [2/]	40.4
Fescue			
California Fescue	Fesctuca californica	200,000 [2/]	4.6
Creeping Red Fescue	Festuca rubra	365,120 * [2/]	8.4
		365,150-449,060 **	
Idaho Fescue	Festuca idahoensis	450,000 [2/]	10.3
Mokelumne Fescue	Festuca rubra	450,000 [2/]	10.3
Molate Fescue	Festuca rubra	450,000 [2/]	10.3
Small Fescue	Vulpia microstachys var. microstachys Festuca microstachys	300,000	6.7
Hairgrass			
Slender Hairgrass	Deschampsia elongata	1,626,160 [2/]	37.3
Tufted Hairgrass	Deschampsia caespitosa	1,864,350 [2/]	42.8
		1,334,020-2,170,630 **	

[1/] Rounded to nearest 10 seeds per pound. Represents number of clean seeds after other crop seeds, weed seeds, and inert matter have been subtracted. Percent germination and purity data would still be needed to calculate PLS. Number of seeds per square foot (SF) for one pound of seed applied per acre was calculated by dividing the number of seeds per pound by 43,560 square feet per acre.

[2/] Data from Table 2, Plant Materials Technical Note No. 40, or University of California DANR Publication 3338.

* Data from Journal of Seed Analysts.

** A range is given when there is a constant variance in the seeds per pound. In these cases an average seeds per pound is also provided. Ranges will be in accordance with "Rules For Testing Seeds" published by the Association of Official Seed Analysts in the Journal of Seed Technology, Volume 6 Number 2, 1986.

TABLE 1. CALIFORNIA SEED DATA FOR SINGLE SPECIES - Cont'd

CALIFORNIA NATIVE GRASSES

COMMON NAME	SCIENTIFIC NAME	SEEDS/LB[1/]	SEEDS/SF[1/]
Melic			
California Melic	Melica californica	326,340 [2/]	7.5
		305,820-362,300 **	
Coastrange Melic	Melica imperfecta	492,080 [2/]	11.3
		420,620-566,720 **	
Needlegrass			
Desert Stipa	Achnatherum speciosum	150,000 [2/]	3.4
Desert Needlegrass	Stipa speciosa		
Foothill Stipa	Nassella lepida	320,160 [2/]	7.3
Foothill Needlegrass	Stipa lepida	316,318-324,000 **	
Nodding Stipa	Nassella cernua	223,680 [2/] (deawned)	5.1
Nodding Needlegrass	Stipa cernua	109,040-286,000 **	
Purple Stipa	Nassella pulchra	109,750 [2/] (deawned)	2.5
Purple Needlegrass	Stipa pulchra	97,590-117,740 **	
Ricegrass			
Indian Ricegrass	Oryzopsis hymenoides	161,920 * [2/]	3.7
	Achnatherum hymenoides		
Sloughgrass			
Sloughgrass	Beckmannia syzigachne	718,000	16.5
Squirreltail			
Big Squirreltail	Sitanion jubatum	126,330 [2/]	2.9
	Elymus multisetus	55,792-278,490 **	
Squirreltail	Sitanion hystrix	136,080 * [2/]	3.1
	Elymus elymoides	86,180-235,870 **	
Wheatgrass			
Slender	Agropyron trachycaulum	133,810 *	3.1
'Primar' 'Yolo'	Elymus trachycaulus ssp. trachycaulus		
Streambank	Agropyron riparium	167,830 *	3.9
'Sodar'	Elymus lanceolatus spp. lanceolatus		
Western	Agropyron smithii	113,400 *	2.6
	Pascopyrum smithii		
Wildrye			
Basin wildrye	Elymus cinereus	143,790 *	3.3
	Lyemus cinereus		
Beardless	Elymus triticoides	169,250 [2/]	3.9
Blue wildrye	Elymus glaucus	134,900 [2/]	3.1
'Anderson' 'Berkeley'		109,940-152,730 **	
Creeping wildrye	Elymus triticoides	114,000 [2/]	2.6
'Rio'	Lyemus triticoides		

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TABLE 1. CALIFORNIA SEED DATA FOR SINGLE SPECIES - Cont'd

CALIFORNIA NATIVE FORBS AND SHRUBS

COMMON NAME	SCIENTIFIC NAME	SEEDS/LB[1/]	SEEDS/SF[1/]
Bladderpod			
Bladderpod	Isomeris arborea	4,500	0.1
Buckwheat			
California 'Duro'	Erigonum fasciculatum (Benth)	334,000	7.7
Sulfur Flower 'Sierra'	Erogonum umbellatum (Torrey)	140,500	3.2
Lupine			
Arroyo lupine	Lupinus succulentus	15,000	0.3
Saltbush			
Desert	Atriplex polycarpa	450,000	10.3
Four-wing 'Marana'	Atriplex canescens	66,230 *	1.5
Quailbush 'Casa'	Atriplex lentiformis	500,000	11.5
Shadscale	Atriplex confertifolia	64,920	1.5
Spear Oracle	Atriplex patula	154,000	3.5
Spiny, spinescale	Atriplex spinifera	96,000	2.2

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TABLE 1. CALIFORNIA SEED DATA FOR SINGLE SPECIES - Cont'd

OTHER GRASSES AND CEREAL GRAINS

COMMON NAME	SCIENTIFIC NAME	SEEDS/LB[1/]	SEEDS/SF[1/]
Barley			
Barley	Hordeum vulgare	13,610 *	0.3
'UC 476' 'UC603'			
'Arivat' 'Seco'		10,700	0.25
Bentgrass			
Redtop	Agrostis gigantea	4,851,250 *	111.4
Bluegrass			
Annual	Poa annua	1,195,240 *	27.4
Bulbous	Poa bulbusa	266,240 *	6.1
Kentucky	Poa pratensis	1,390,280 *	31.9
		1,020,600-1,757,700 **	
Sherman Big	Poa ampla	1,046,960 *	24.0
	Poa secunda		
Bristlegrass			
Green	Setaria viridis	542,000	12.4
Plains	Setaria macrostachya	305,000	7.0
Yellow	Setaria lutescens	172,000	4.0
	Setaria glauca		
Bromegrass			
Red Brome	Bromus rubens	268,000	6.2
'Panoche'			
Rescuegrass	Bromus catharticus	51,260 *	1.2
Smooth Brome	Bromus inermis	142,880 *	3.3
		136,080-149,690 **	
Softchess	Bromus mollis	251,750 *	5.8
'Blando' brome	Bromus hordeaceus ssp. multiformis		
Buckwheat	Fagopyrum esculentum	20,400 [2/]	0.47
'Mancan' 'Manor'	Fagopyrum saggitatum		
Corn			
Field Corn	Zea mays	1,360 *	0.03
Dallisgrass			
Dallisgrass	Paspalum dilatatum	281,230 *	6.5

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COMMON NAME	SCIENTIFIC NAME	SEEDS/LB[1/]	SEEDS/SF[1/]
Eleusine			
Indian Goosegrass	Eleusine indica	533,000	12.2
Ragimillet	Eleusine coracana	257,000	5.9
Threespike	Eleusine triistachya	527,000	12.1
Fescue			
Chewings fescue	Festuca rubra var. commutata	450,000 [2/]	10.3
Hard fescue	Festuca trachyphlla	591,950 *	13.6
'Scaldis'	Festuca ovina var. duriusculo		
'Durar' 'Eureka'			
Foxtail fescue	Festuca megalura	857,000	19.7
'Zorro'	Vulpia myuros var. hirsuta		
Sheep fescue	Festuca ovina	528,440 *	12.1
'Covar'			
Tall fescue	Festuca arundinacea	206,390 *	4.7
'Fawn' also Dwarf types		176,900-233,600 **	
Foxtail			
Creeping Meadow	Alopecurus arundinaceus	613,000	14.1
Meadow	Alopecurus pratensis	405,970 *	9.3
Indian Ricegrass	Oryzopsis hymenoides	141,000	3.2
'Paloma'	Achnatherum hymenoides		
Millet			
Foxtail millet	Setaria italica	217,730 *	5.0
		183,710-249,480 **	
Japanese millet	Echinochloa crus-galli ssp. Frumentacea	142,880 *	3.3
	Echinochloa frumentacea		
Proso Millet	Panicum miliaceum	83,920 *	1.9
Milo			
Milo	Sorghum vulgare ssp. subglabrescens	24,950 *	0.57
Grain Sorghum	Sorghum bicolor ssp. bicolor	13,610-36,290 **	
Oats			
Common oats	Avena sativa	19,280 *	0.44
'Cayuse' 'Montezuma'		15,880-22,680 **	
Red Oats	Avena byzantina	19,280 *	0.44
'California Red'	Avena sativa	15,880-22,680 **	
Wildoats	Avena fatua	30,000	0.7

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OTHER GRASSES AND CEREAL GRAINS

COMMON NAME	SCIENTIFIC NAME	SEEDS/LB[1/]	SEEDS/SF[1/]
Orchardgrass			
Orchardgrass	Dactylis glomerata	428,650 *	9.8
'Berber', 'Akaroa', 'Latar', 'Palestine'		381,020-476,280 **	
Panicum			
Blue Panicum	Panicum antidotale	621,430 *	14.3
Phalaris			
Hardinggrass	Phalaris tuberosa ssp. stenoptera Phalaris aquatica	340,200 *	7.8
Koleagrass 'Perla'	Phalaris tuberosa ssp. hirtiglumis Phalaris aquatica	340,200 *	7.8
Ricegrass			
Smilo	Oryzopsis miliacea Piptatherum miliaceum	911,740 *	20.9
Rye			
Cereal 'Merced'	Secale cereale	18,140 *	0.42
'Tetra petkus	Secale cereale var. tetra petkus	19,000	0.44
Ryegrass			
Annual	Lolium multiflorum	190,510 *	4.4
'Common' 'Gulf'	Lolium perenee ssp.multiflorum	179,170-201,850 **	
Perennial	Lolium perenee	240,410 *	5.5
		210,920-269,890 **	
Wimmera 62	Lolium rigidum	185,000	4.25
Sorghum-Sudangrass 'Sudax'	Sorghum vulgare x Sorghum sudanense	17,000 [2/]	0.4
Sudangrass			
Sudangrass 'Piper'	Sorghum sudanense Sorghum vulgare var. sudanense Sorghum bicolor spp. drummondii	45,360 *	1.0
		38,560-49,900 **	
Timothy			
Swamp Timothy	Heleochloa schoenoides Crypsis schoenoides	1,750,000	40.2
Timothy	Phleum pratence	1,163,480 *	26.7
		1,090,910-1,236,060 **	
Triticale			
Triticale 'Juan'	x Triticosecale	12,000 [2/]	0.28

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COMMON NAME	SCIENTIFIC NAME	SEEDS/LB[1/]	SEEDS/SF[1/]
Veldtgrass			
Mission Veldtgrass	Ehrharta calycina	297,760 *	6.8
Watergrass			
Watergrass	Echinochloa crus-galli	300,000 *	6.9
Barnyardgrass	Echinochloa crus-galli	300,000 *	6.9
Wheat			
Common	Triticum vulgare	11,340 *	0.26
'Anza'	Triticum aestivum		
Wheat x Wheatgrass Hybrid	Agropyron x Tritcum	12,000 *	0.28
'Regreen'			
Wheatgrass			
Beardless	Agropyron spicatum	124,740 *	2.9
'Whitmat'	Agropyron spicatum var. inerme Pseudoroegneria spicata ssp. inermis		
Bluebunch	Agropyron spicatum. Pseudoroegneria spicata ssp. spicata	124,740 *	2.9
Crested	Agropyron cristatum	310,720 *	7.1
Desert	Agropyron desertorum	195,050 *	4.5
'Nordan'		181,440-201,850 **	
Intermediate	Agropyron intermedium	79,380*	1.8
'Greenar' 'Tegmar'	Elytrigia intermedia	72,580-86,180 **	
Pubescent	Agropyron intermedium	81,650 *	1.9
'Luna' 'Topar'	Elytrigia intermedia	72,580-86,180 **	
Siberian	Agropyron sibiricum Agropyron fragile ssp. sibiricum	170,000 *	3.9
Tall	Agropyron elongatum	74,840 *	1.7
'Alkar' 'Largo' 'Jose'	Elytrigia elongata		
Wildrye			
Russian	Elymus junceus Psathyrostachys juncea	163,300 *	3.7
		156,490-167,830 **	
Zoysia			
Zoysiagrass	Zoysia matrella	681,000	15.6

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LEGUMES

COMMON NAME	SCIENTIFIC NAME	SEEDS/LB[1/]	SEEDS/SF[1/]
Alfalfa			
Alfalfa	Medicago sativa	226,800 *	5.2
Beans			
CA Blackeye, Blackeyed Peas	Vigna sinensis Vigna unguiculate	3,630 *	0.08
Bell Bean, Horsebean, Fava Bean	Vicia faba	3,000 [2/]	0.07
Hyacinth or Lab Lab	Lablab purpureus	3,000	0.07
Clover			
Alsike	Trifolium hybridum	680,400 *	15.6
Berseem 'Multicut'	Trifolium alexandrinum	206,900 [2/]	4.8
Crimson	Trifolium incarnatum	149,690 *	3.4
Hairy Canary	Dorycnium hirsutum	130,000	3.0
Ladino or White Dutch or New Zealand White	Trifolium repens	793,800 *	18.2 680,400-907,200 **
Red	Trifolium partense	272,160 *	6.2
Rose 'Hykon'	Trifolium hirtum	163,300 *	3.8
Strawberry 'Salina'	Trifolium fragiferum	288,040 *	6.6
Subterranean 'Clare' 'Mt. Barker'	Trifolium subterraneum	110,000 [2/]	2.5
Guar			
Guar	Cyamopsis tetragonolobe	15,880 *	0.4
Medic			
Barrel Medic	Medicago tribuloides Medicago truncatula	300,000	6.7
Black Medic	Medicago lupulina	265,360 *	6.1
Bur Medic 'Santiago' 'Serena'	Medicago polymorpha	170,400 [2/]	3.9
California Burclover	Medicago hispida Medicago polymorpha	170,100 *	3.9
Peas			
Field Pea 'Austrian Winter' 'Magnus'	Pisum sativum	2,400	0.06 1,800-3,000 [2/]**
Cowpea 'CB5' 'Chinese Red'	Vigna unguiculata ssp. unguiculata	3,000	0.07 2,000-4,000 [2/]**

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COMMON NAME	SCIENTIFIC NAME	SEEDS/LB[1/]	SEEDS/SF[1/]
Sainfoin			
Sainfoin	Onobrychis viciaefolia (unhulled)	22,680 *	0.5
'Onar' 'Remont'	Onobrychis viciifolia		
Scurfpea			
Scurfpea, Leather root	Psoralea macrostachy	25,000	0.6
	Hoita marostachya		
Sesbania			
Sesbania	Sesbania exaltata	47,630 *	1.1
Sweet Clover			
White	Melilotus alba	258,550 *	5.9
'Hubam'			
Yellow	Melilotus officinalis	258,550 *	5.9
'Madrid'			
Trefoil			
Birdsfoot	Lotus corniculatus	369,680 *	8.5
'Cascade' 'Empire' 'Viking'			
Narrowleaf	Lotus tenuis	485,000	11.1
Vetch			
Cahaba White	Vicia sativa x Vicia cordata	8,000	0.2
Common	Vicia sativa	8,000 [2/]	0.2
Hairy	Vicia villosa	16,300 [2/]	0.4
Milkvetch	Astragalus civer	122,470 *	2.8
'Lutana'			
Perennial or Cow vetch	Vicia cracca spp. tennuifolia	36,000	0.8
Purple	Vicia benghalensis	9,980 *	0.23
Woolypod or Winter	Vicia dasycarpa	11,340 *	0.26
'Lana'	Vicia villosa spp. dasycarpa		

[1/] Rounded to nearest 10 seeds per pound. Represents number of clean seeds after other crop seeds, weed seeds, and inert matter have been subtracted. Percent germination and purity data would still be needed to calculate PLS. Number of seeds per square foot (SF) for one pound of seed applied per acre was calculated by dividing the number of seeds per pound by 43,560 square feet per acre.

[2/] Data from Table 2, Plant Materials Technical Note No. 40, or University of California DANR Publication 3338.

* Data from Journal of Seed Analysts.

** A range is given when there is a constant variance in the seeds per pound. In these cases an average seeds per pound is also provided. Ranges will be in accordance with "Rules For Testing Seeds" published by the Association of Official Seed Analysts in the Journal of Seed Technology, Volume 6 Number 2, 1986.

TABLE 1. CALIFORNIA SEED DATA FOR SINGLE SPECIES - Cont'd

FORBS AND SHRUBS

COMMON NAME	SCIENTIFIC NAME	SEEDS/LB[1/]	SEEDS/SF[1/]
Bulrush			
Alkali	Scripus robustus	178,000	4.1
American	Scirpus americanus	163,000	3.7
Knotted clubrush	Scirpus tuberosus	178,000	4.1
River	Scirpus flaviatilis	117,000	2.7
Burhead			
Burhead	Echinodorus cordifolius	97,000	2.2
Bureed			
Bureed	Sparganium eurycarpum	17,000	0.4
Burnet			
Burnet	Sanguisorba minor	53,000	1.2
Crotalaria			
Crotalaria or Sunn Hemp	Crotalaria juncea	15,000	0.3
Filaree			
Filaree	Erodium cicutarium	199,580 *	4.6
Phacelia			
Tansy phacelia 'Phaci'	Phacelia tanacetifolia	824,000 [2/]	18.9
Poppy			
California Poppy	Eschscholzia californica	293,000	6.7
Safflower			
Safflower	Carthamus tinctorius	13,610 *	0.3
Sago pondweed			
Sago pondweed	Potaogeton pectinatus	97,000	2.2
Saltbush			
Australian	Atriplex semibaccata	75,000	1.7
Fat hen	Atriplex patula ssp. hastata Atriplex prostrata	908,000	20.8
Redscale	Atriplex rosea	151,330	3.5
Smartweed			
Bigseed ladysthumb	Polygonum pennsylvanicum	106,000	2.4
Dotted	Polygonum punctatum	261,000	6.0
Ladysthumb	Polygonum persicaria	365,000	8.4
Pale ladysthumb	Polygonum lapathifolium	155,000	3.6
Swamp	Polygonum hydropipperoides	196,000	4.5
Spikerush			
Spikerush	Heleocharis palustris	901,000	20.7
Sunflower			
Sunflower	Helianthus annus	7,000	0.16

[1/] Rounded to nearest 10 seeds per pound. Represents number of clean seeds after other crop seeds, weed seeds, and inert matter have been subtracted. Percent germination and purity data would still be needed to calculate PLS. Number of seeds per square foot (SF) for one pound of seed applied per acre was calculated by dividing the number of seeds per pound by 43,560 square feet per acre.

[2/] Data from Table 2, Plant Materials Technical Note No. 40, or University of California DANR Publication 3338.

* Data from Journal of Seed Analysts.

** A range is given when there is a constant variance in the seeds per pound. In these cases an average seeds per pound is also provided. Ranges will be in accordance with "Rules For Testing Seeds" published by the Association of Official Seed Analysts in the Journal of Seed Technology, Volume 6 Number 2, 1986.

TABLE 2. VARIABILITY IN SEEDS PER POUND FOR SELECTED NATIVE GRASSES [1/]

Species	No. of Samples	Number of Seeds per Pound		
		Low Value	High Value	Average Value
Bromus carinatus	9	32,718	220,194	103,683
Deschampsia caespitosa	3	1,334,018	2,170,633	1,864,350
Elymus glaucus	4	109,937	152,727	124,724
Hordeum brachyantherum ssp. brachyantherum	10	78,668	153,679	100,798
Melica californica	3	305,825	362,300	326,341
Melica imperfecta	4	420,623	566,717	492,076
Nassella cernua	9	109,039	286,003	223,675
Nassella lepida	2	316,318	324,000	320,159
Nassella pulchra (deawned)	10	97,590	177,743	109,749
Sitanion hystrix	*	86,184	235,872	136,080 *
Sitanion jubatum	11	55,792	278,487	126,327

* Data is a standard established by the Association of Official Seed Analysts.

[1/] This data was developed from seed analysis data provided by the California Department of Food and Agriculture's Seed Laboratory. November 21, 1995.

TABLE 3. VARIABILITY IN PERCENT PURITY AND GERMINATION FOR SELECTED NATIVE GRASSES AND OTHER GRASSES

Grass Species	Sample 1		Sample 2		Sample 3		Sample 4	
	% Purity	% Germination	% Purity	% Germination	% Purity	% Germination	% Purity	% Germination
Achnatherum coronatum	70.00	40	--.--	64				
Agropyron desertorum	96.87	91	98.10	93	96.86	90	78.00	82
Agropyron smithii	87.04	86	94.46	93	75.00	56		
Agropyron trachycaulum	99.33	95	99.12	98	97.00	83		
Bouteloua gracilis	60.00	60	39.00	56	95.00	88		
Bromus carinatus	99.09	--	97.63	--	97.73	85	94.88	96
Bromus carinatus var. carinatus	98.00	91	98.00	85	90.00	85	--.--	61
Bromus catharticus	97.00	91	95.00	85	97.00	92	94.00	71
Bromus rubens	92.16	--	92.01	14	89.42	19	93.00	10
Elymus glaucus	96.94	85	80.00	60	--.--	85	99.70	89
Elymus triticoides	85.00	85	90.00	80	88.00	90	--.--	10
Eragrostis curvula	97.00	85	98.00	65	95.00	87	97.00	82
Festuca idahoensis	90.00	75	90.00	80				
Festuca rubra	84.00	90	95.00	85	97.00	80	95.00	85
Hesperoatipa comata	97.69	--	95.27	89	29.00	13		
Hordeum brachyantherum ssp. brachyantherum	59.11	82	90.14	95	95.00	80		
Melica californica	58.58	66	75.18	69	90.00	60		
Melica imperfecta	66.57	11	69.51	58	50.90	54	90.00	60
Nassella cernua	67.71	--	75.53	11	87.10	59	91.47	71
Nassella pulchra	83.57	--	90.12	70	90.03	73	88.56	81
Oryzopsis hymenoides	98.00	80	94.00	11	95.00	11	99.00	--
Poa secunda ssp. secunda	80.00	40	96.12	95				
Sitanion hystrix	42.67	25	9.00	80	92.90	59	90.01	96
Sitanion jubatum	48.35	15	49.00	37	23.24	89	34.37	84

TABLE 3. VARIABILITY IN PERCENT PURITY AND GERMINATION FOR SELECTED NATIVE GRASSES AND OTHER GRASSES - Cont'd

Grass Species	Sample 5		Sample 6		Sample 7		Sample 8	
	% Purity	% Germination	% Purity	% Germination	% Purity	% Germination	% Purity	% Germination
Bromus carinatus	99.76	97	95.00	80	--.--	85	98.00	74
Bromus carinatus var. carinatus	--.--	80	--.--	73	98.46	88		
Bromus catharticus	97.00	89						
Bromus rubens	98.84	47	95.00	80				
Elymus glaucus	99.92	86	80.00	85	97.80	40		
Elymus triticoides	88.00	90						
Festuca rubra	87.00	69	98.00	80				
Nassella cernua	80.00	50	94.00	82				
Nassella pulchra	80.04	53	93.36	41	72.00	45	70.00	60
Sitanion hystrix	72.56	76	96.02	92				
Sitanion jubatum	59.33	65	53.07	--	8.48	--	--.--	90

Grass Species	Sample 9		Sample 10		Sample 11	
	% Purity	% Germination	% Purity	% Germination	% Purity	% Germination
Bromus carinatus	93.00	69				
Elymus glaucus	98.22	87	97.00	88	99.00	75
Nassella pulchra	--.--	50	90.00	38		

Sources of Data Used to Develop Table 3

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