Annual weight performance of woody and thorny species for the On-Site Grazingland Study NRI.

NRI production protocol Species Composition by Weight (chapter 14) for woody plants at the expanded plots is best done by using a weight unit collected in the field from outside the quadrat and counting the number of equivalent weight units contained on each of the woody species within the expanded quadrat. However, this is not always possible due to size or other variations. In those instances, use the following guide.

The weight per plant-unit tables are listed by common name and species symbol. The weight units are variable in measurements, e.g. canopy and height in inches and feet. All weights are in grams and are air dry weights. Enter these weights into the CASI as the green weight and reconstruct the dry weight as 100% unless otherwise noted.

The guide also lists several species' leaf retention time ranges. Use this for when representative weight units are collected in the field. Divide the leaf only portion of the representative weight unit by the number of years of leaf retention identified for each species.

Questions contact: Gene.Fults@usda.gov

Aspen (POTR5) wt./plant unit

DBH in.	Height ft.	Crown spread ft.	Annual yield/tree (gram)
2	10-25	5	372
5	36-46	7	667
7	39-57	9	1026
12	48-75	12	1689
13	50-76	14	2202
	Baker (1925)	Beetle (1974)	SCS (1970)

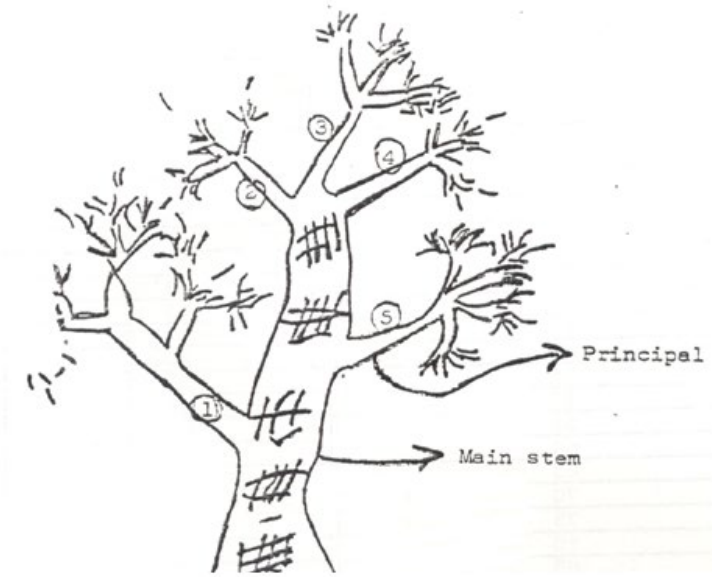
- Diameter Breast Height (DBH)
- Aspen stand categories of health: stable; decadent; successional; dominant; co-dominant; intermediate; intermediate to suppressed; suppressed.

Ponderosa Pine (PIPO) wt./plant unit

D.B.H. inches	Current herbage grams
1	36
2	118
3	240
4	417
5	599
6	916
7	1202
8	1492
9	1923
10	2359
15	5770
20	9135

Joshua Tree (YUBR)
wt./plant unit

Number of Principal Stems	grams
01	227



Sonoran scrub oak (QUTU2) wt./plant unit

Width of Canopy (ft.)	Current herbage (grams/tree)
1	23
2	68
3	159
4	263
5	363
6	463
7	567
8	680
9	816
10	953
11	1089
12	1179
13	1429

Gamble oak (QUGA) wt./plant unit

Sq ft of canopy	Air dry grams (> 21 sq in basal area)	Air dry grams (< 21 sq in basal area)
1	508	41
2	649	68
3	798	109
4	943	127
5	1084	159
10	1592	240
15	1950	327
20	2345	408
25	2676	472
30	3025	535
35	3279	621
40	3851	676
50	4273	726
60	4990	803

Emory Oak (QUEM) wt./plant unit

Height of Tree ft.	Grams/ tree	Height of Tree ft.	Grams/ tree	Height of Tree ft.	Grams/ tree	Height of Tree ft.	Gram s/tree
8	889	20	16329	32	33112	44	54431
9	907	21	17690	33	34473	45	58060
10	2631	22	19051	34	35834	46	59874
11	3629	23	20412	35	37648	47	62596
12	4990	24	21772	36	39009	48	66224
13	6804	25	23587	37	40370	49	68946
14	8165	26	24948	38	41730	50	71668
15	9525	27	26308	39	43091	60	90718
16	10886	28	27669	40	44452	70	99790
17	12247	29	29030	41	46266		
18	13608	30	30391	42	48988		
19	14969	31	31751	43	51709		

Alligator Juniper (JUDE2) wt./plant unit

Height of tree ft.	Male gram wt./tree	Female gram wt./tree	Height of tree ft.	Male gram wt./tree	Female gram wt./tree
1	9	9	16	1270	3402
2	23	23	17	1542	4082
3	45	45	18	1837	4763
4	82	82	19	2050	5534
5	136	136	20	2268	6305
6	181	227	21	2440	7031
7	227	318	22	2540	7756
8	272	454	23	2631	8391
9	354	635	24	2676	8936
10	417	826	25	2722	9398
11	535	1089	26	2767	9798
12	603	1442	27	2803	10129
13	726	1814	28	2812	10378
14	862	2313	29	2858	10614
15	1043	2812	30	2903	10795

OneSeed Juniper (JUMO) wt./plant unit

Height of tree ft.	Male gram wt./tree	Female gram wt./tree	Height of tree ft.	Male gram wt./tree	Female gram wt./tree
4	113	113	18	4536	6350
5	159	181	19	4876	6804
6	204	272	20	5103	7257
7	272	340	21	5330	7620
8	340	445	22	5488	7938
9	431	907	23	5670	8391
10	680	1588	24	5851	8845
11	1588	2268	25	6033	9299
12	2041	2948	26	6123	9525
13	2631	3856	27	6237	9979
14	3084	4309	28	6260	10433
15	3402	4990	29	6305	10659
16	3856	5443	30	6350	10886
17	4309	5897	35	6804	12247

Utah Juniper (JUOS) wt./plant unit

Crown diameter (ft)	Weight per tree (grams)	Weight per tree (grams)	Weight per tree (grams)
	Sparse foliage	Medium foliage	Dense foliage
1	45	45	45
2	136	136	136
3	272	272	318
4	454	454	544
5	590	635	862
6	726	862	1225
7	862	1134	1633
8	1043	1406	2132
9	1179	1724	2676
10	1315	2087	3266
11	1497	2449	3901
12	1633	2812	4627
13	1814	3266	5398
14	1996	3674	6214
15	2132	4128	7076
16	2313	4627	8029
17	2495	5126	9026
18	2631	5625	10070
19	2812	6169	11158
20	2994	6713	12338

Twoneedle pinyon (PIED) wt./plant unit

Ht. tree ft.	Grams /tree	Ht. tree ft.	Grams/ tree	Ht. tree ft.	Grams/ tree	Ht. tree ft.	Grams /tree
3	45	15	3175	27	6759	39	7303
4	136	16	3629	28	6804	40	7257
5	181	17	4082	29	6917	41	7235
6	249	18	4536	30	6985	42	7212
7	318	19	4990	31	7031	43	7167
8	386	20	5443	32	7076	44	7144
9	431	21	5670	33	7121	45	7031
10	454	22	5897	34	7167	46	6917
11	1134	23	6237	35	7212	47	6804
12	1588	24	6350	36	7235	48	6690
13	2041	25	6577	37	7326	49	6577
14	2722	26	6690	38	7348	50	6350

Singleleaf pinyon (PIMO) wt./plant unit

Tree ht. ft.	Grams/tree	Tree ht. ft.	Grams/tree	Tree ht. ft.	Grams/tree
1	136	14	5262	27	16329
2	454	15	5806	28	17690
3	816	16	6441	29	19051
4	998	18	7031	30	20412
5	1361	19	7711	31	22453
6	1724	20	8391	32	24494
7	2177	21	9072	33	26853
8	2495	22	9979	34	28576
9	2948	23	10795	35	29846
10	3175	24	11703	40	34700
11	3856	25	13835	45	38646
12	4309	26	14969	50	41730
13	4763				

Creosote Bush (LATR2) wt./plant unit

Height of brush (ft.)	Grams/Bush
1.0	14
1.5	27
2.0	41
2.5	50
3.0	59
3.5	227
4.0	363
4.5	454
5.0	590
5.5	680
6.0	816
6.5	907
7.0	1021
7.5	1134

Skunkbrush (RHTR) wt./plant unit

Canopy height X width (inches)	Grams /Bush
400	29
600	42
800	52
1000	64
2000	124
3000	142
4000	179
5000	215
6000	252
7000	290
8000	327
9000	363
10000	401
11000	438
12000	703

Mesquite(PRVE) wt./plant unit

Height ft. X Canopy Ft.	Grams/bush	Height X Canopy Ft.	Grams/bush
5	63	450	22676
10	136	500	24943
20	340	550	26984
30	680	600	28571
40	2041	650	30159
50	2494	700	31519
60	3175	750	32880
70	3855	800	34014
80	4308	850	35374
90	4762	900	36281
100	5215	950	37415
150	7937	1000	38322
200	10658	1050	39002
250	13152	1100	39683
300	15646	1150	40363
350	17914	1200	40816
400	20635		

Catclaw acacia (SEGR4) wt./plant unit

Height of shrub ft.	Grams/bush
2	23
3	113
4	340
5	703
6	1089
7	1474
8	1837
9	2223
10	2585
11	2790
12	2903

Ocotillo (FOUQU) wt./plant unit

Height Ft.	Grams/bush	Height Ft.	Grams/bush
1	4	11	43
2	8	12	46
3	11	13	50
4	15	14	54
5	20	15	58
6	23	16	62
7	27	17	66
8	31	18	69
9	35	19	73
10	39	20	77

Fairy Duster/False Mesquite (CAER) wt./plant unit

Height X width of canopy (inches)	Grams /bush	Height X width of canopy (inches)	Grams /bush	Height X width of canopy (inches)	Grams /bush	Height X width of canopy (inches)	Grams /bush
10	1	110	18	210	32	310	47
20	2	120	19	220	33	320	48
30	5	130	20	230	34	330	49
40	7	140	21	240	36	340	50
50	9	150	23	250	38	350	51
60	10	160	24	260	39	360	54
70	13	170	26	270	41	370	54
80	14	180	27	280	42	380	57
90	16	190	29	290	44	390	59
100	17	200	30	300	45	400	60

Viscid acacia (VAVE) wt./plant unit

Tree height ft.	Grams / Tree
2	23
3	45
4	59
5	68
6	91
7	113
8	127
9	136
10	159
11	172
12	186
13	204
14	218
15	231

Whitethorn acacia (VACO9) wt./plant unit

Tree height ft.	Grams/Tree
2	45
3	181
4	318
5	431
6	567
7	703
8	839
9	975
10	1089
11	1225
12	1361
13	1474
14	1610
15	1746

Paloverde (PARKI2) wt./plant unit

Canopy diameter ft.	Grams/tree	Canopy diameter ft.	Grams/tree
4	68	21	1361
5	136	22	1497
6	181	23	1656
7	227	24	1837
8	272	25	2041
9	340	26	2245
10	408	27	2381
11	476	28	2563
12	544	29	2676
13	635	30	2948
14	717	31	3221
16	794	32	3266
17	907	33	3379
18	998	34	3538
19	1111	35	3674
20	1225		

Other Thorny Desert Plants wt./plant unit

Name and symbol	Grams/plant
Saguaro (CARNE2)	680/ 10 ft height
Barrel cactus (FEROC)	1 ft. = 68 2 ft. = 91 3 ft. = 136
Jumping cholla (CYFU10)	2 ft. = 68 4 ft. = 91 6 ft. = 136
Teddybear cholla (CYBI9)	2 ft. = 23 3 ft. = 45 4 ft. = 68
Buckhorn cholla (CYACA2)	2 ft. = 45 3 ft. = 68 4 ft. = 91
Staghorn cholla (CYVE3)	2 ft. = 45 3 ft. = 68 4 ft. = 91
Christmas cactus (CYLE8)	2 X 2 ft. = 45 3 x 3 ft. = 91

Other Thorny Desert Plants wt./plant unit

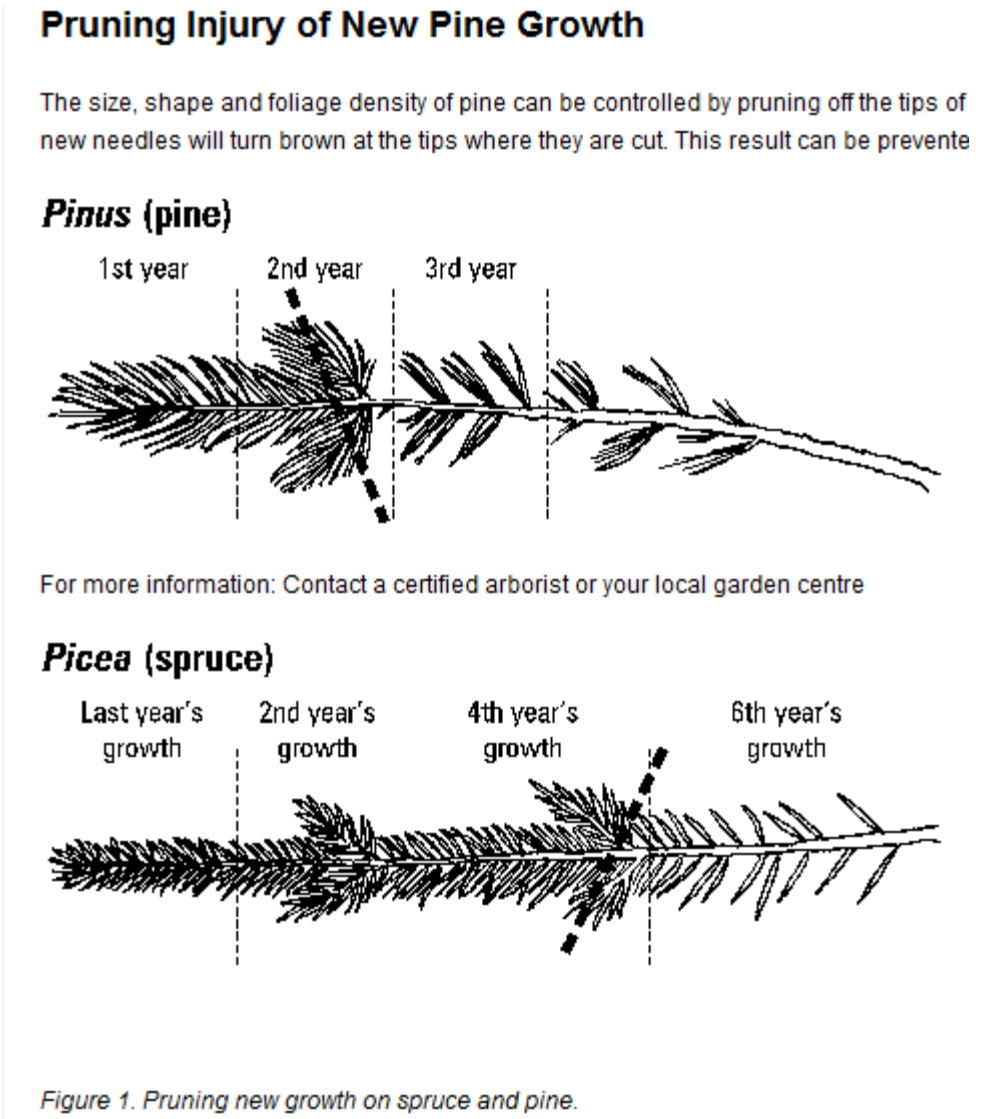
Soapweed/Soaptree (YUCCA)	15% of total green weight plus fruiting stem and fruit. 40% dry weight reconstruction.
Sotol (DASYL)	3’ X 3’ = 771 gram
Prickly Pear (OPUNT)	10% of total green weight of total number of pads plus current fruit. 20% dry weight reconstruction.

Leaf Retention Tables

- When using the leaf retention tables be sure to **collect the entire leaf** mass of the branch.

- Terminal bud scars mark the point of origin for each year's leader growth. The scars are obvious for the first 2-3 years. Older scars are obscured or covered by bark.

- Terminal buds are a ring-like scar



Pruning Injury of New Pine Growth

The size, shape and foliage density of pine can be controlled by pruning off the tips of new needles will turn brown at the tips where they are cut. This result can be prevente

***Pinus* (pine)**

For more information: Contact a certified arborist or your local garden centre

***Picea* (spruce)**

Figure 1. Pruning new growth on spruce and pine.

Leaf Retention Tables

Pines PINUS

Leaf retention is higher at high elevation and latitudes

• Slash pine (PIEL)	2 years
• Longleaf pine (PIPA2)	2 years
• Bishop pine (PIMU)	3-4 years
• Lodgepole pine(PICO)	4-8 years
• Twoneedle pinyon (PIED)	5 yrs (2 yr fruit)
• Limber pine (PIFL2)	5-9 years
• Ponderosa pine (PIPO)	5-8 years
• W. White pine (PIMO3)	5-(10)- 20 years
• Oneneedle pinyon (PIMO)	8-10 years
• Bristlecone pine (PILO)	8 (17) – 50 years

Leaf Retention Tables

- Douglas-fir (PSME) 6 to 8 years
- Grand fir (ABGR) 6 to 8 years
- Black Spruce (PICEA/PIMA) 8-15 years
- Oak (QUERC) most sp. are 1 year. 1-2.5 years
  - leaves of stump sprouts and saplings 24-36 month
- Junipers (JUNIP) 5 years
  - Immature berries 40% moisture.
  - Mature berries 5% moisture and stay on tree 2 years.
- Mountain Mahogany (CERCO) 2 years
- Saw Palmetto (SERE2) 3.5 years

Leaf Retention Tables

Wyoming Big Sagebrush ARTRW8

- West of Rockies
  - Before July 15th (soil dry out) subtract up to 33%* for last fall's growth that overwintered.
    - Winter persistent leaves are shorter and darker than current years growth.
  - After July 15th add up to 24% for ephemeral leaves that have senesced.
  - Add estimated % for inflorescence and seeds based on growing conditions.
- East of Rockies
  - No adjustment except normal % of growth curve, % climate, and % grazed.

- * percentages are leaf only without the weight of stem elongation. E.G. before July 15th clipped total 120 g – 15 g stems = 105X.33= 35g , 120-35= 85g X other reconstruction factors.

- Annual production includes leaves, current twigs, inflorescence and fruits produced in a single year.