	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	**WSDA Crop 2015**	**GWMA Acreage**	**N Comm-Low ll**	**N Comm-Avg ll**	**N Comm-Hi ll**	**Comm N Use %**	**N Manure-Low l**	**N Manure-Avg l**	**N Manure-Hi ll**	**N Manure Use %**	**N Compost-Low ll**	**N Compost-Avg ll**	**N Compost-Hi ll**	**N Compost Use %**	**N Atmos.-Low**	**N Atmos.-Avg**	**N Atmos.-Hi**	**N Irrig Water l**	**CalcResidualN-Low**	**CalcResidualN-Avg**	**CalcResidualN-Hi**
2			**lbs/acre**	**lbs/acre**	**lbs/acre**	**% crop acres**	**lbs/acre**	**lbs/acre**	**lbs/acre**	**% crop acres**	**lbs/acre**	**lbs/acre**	**lbs/acre**	**% crop acres**	**lbs/acre**	**1bs/acre**	**lbs/acre**	**lbs/acre**	**lbs/acre**	**lbs/acre**	**lbs/acre**
3	Apple	17333	0	59.78	150	86.3%	0.0	0.0	0.0	0.0%	15.0	46.6	100.0	13.7%	1.53	2.05	6.15	5.50	40	50	60
4	Corn (Silage)	16778	40	214.14	434	49.6%	20.0	203.3	324.0	53.9%	0.0	0.0	0.0	0.0%	1.53	2.05	6.15	5.23	0	10	20
5	Triticale	10780	20	107.03	225	27.2%	20.0	104.4	350.0	74.8%	170.0	170.0	170.0	0.8%	1.53	2.05	6.15	5.23	10	13	15
6	Grapes (Juice)	10257	50	79.64	100	91.0%	0.0	0.0	0.0	0.0%	21.5	63.6	90.0	11.6%	1.53	2.05	6.15	4.86	60	60	60
7	Alfalfa*	7989	0	73.76	210	91.8%	10.0	161.0	300.0	8.2%	0.0	0.0	0.0	0.0%	1.53	2.05	6.15	6.58	80	80	80
8	Pasture	6731	50	120.21	200	97.2%	17.0	17.0	17.0	2.8%	0.0	0.0	0.0	0.0%	1.53	2.05	6.15	6.95	0	0	0
9	Cherry	6336	20	55.65	125	80.5%	0.0	0.0	0.0	0.0%	15.0	52.2	72.0	19.5%	1.53	2.05	6.15	5.50	35	48	60
10	Hops	5961	25	191.80	225	97.3%	132.0	132.0	132.0	2.7%	30.0	30.0	30.0	16.0%	1.53	2.05	6.15	5.48	50	50	50
11	Grapes (Wine)	5126	15	25.00	40	100.0%	0.0	0.0	0.0	0.0%	36.6	45.8	54.9	20.0%	1.53	2.05	6.15	4.86	35	35	35
12	Pear	3331	0	56.95	100	76.6%	0.0	0.0	0.0	0.0%	15.0	58.5	80.0	23.4%	1.53	2.05	6.15	7.31	40	70	100
13	Mint	1418	80	269.23	300	100.0%	0.0	0.0	0.0	0.0%	0.0	0.0	0.0	0.0%	1.53	2.05	6.15	6.39	0	20	40
14	Wheat	1283	60	106.09	120	93.9%	90.0	130.9	240.0	22.4%	0.0	0.0	0.0	0.0%	1.53	2.05	6.15	4.27	88	88	88
15	Corn (Grain)	1166	100	214.11	300	71.3%	50.0	134.9	220.0	62.6%	0.0	0.0	0.0	0.0%	1.53	2.05	6.15	5.23	120	128	135
16	Asparagus	854	50	99.40	100	100.0%	0.0	0.0	0.0	0.0%	0.0	0.0	0.0	0.0%	1.53	2.05	6.15	0.00	30	30	30
17	Peach/Nectarine	843	30	50.59	80	81.0%	0.0	0.0	0.0	0.0%	15.0	28.3	30.0	19.0%	1.53	2.05	6.15	7.41	45	45	45
18																					
19	**Legend**																				
20	Informational																				
21	N Inputs																				
22	N Outputs																				
23	N Totals																				
24																					

25 **Attribute metadata and references:**

26 GWMA Acreage: Calculated crop acreage located inside GWMA boundary from WSDA GIS data. Triticale is double-cropped with silage corn. Acreage is estimated by querying corn by irrigation type (not a practice in rill systems).

27 N lbs/acre rates for Commercial, Manure, and Compost sources (Low, Avg., and High) determined through WSDA survey results - see Nitrogen Collection Survey document.

28 N lbs/acre Average: The weighted average by acreage represented - see Nitrogen Collection Survey document for calculations and equations.

29 N Use % crop acres: Percentage by Source based on surveyed results - see Nitrogen Collection Survey document. This is to apply accurate calculations based on N source.

30 Calculated Residual N = N Uptake minus N removal. (Low, Average, High values).

31 N Crop Uptake and Removal (harvested): See Addendum 1 N Uptake Draft 6 - Low, Median, High values from SVID and Roza Irrigation District N Usage document.

32 N Atmospheric: Low = 1.53lbs N/ac (1.69 kg/HA) from MOR409 Mt Rainier station (NAPD and CASNET, 2012), Avg = 2.05 lbs N/ac BPJ value from Ranil Dhammapala Atmospheric Scientist from ECY, High = 6.15 lbs N/ac is the Avg value mulitplied by a safety factor of 3.

33 NAPD and CASNET - National Atmospheric Depostion Program and Clean Air Status and Trends Network https://www3.epa.gov/castnet/site_pages/MOR409.html (Trends in Total N chart)

34 *Alfalfa N fixation from atmospheric N is variable depending on the presence of rhizobia, pH, and nutrient availability (see extension publication Alfalfa Nutrient Management Guide PNW0611).

35 N Irrigation Water Sampling: See Adendum 2. Average value of .809 mg/l Source: USGS Water Data Report 2012.

36 N Irrigation Water - See Addendum 3. Uses water duty (acre ft cu used per crop). Acre feet cu water per acre converted to liter/acre, then multiplied by .809 mg/l.

37 N Loss to Atmosphere (Volitilization) : from NRCS Nitrogen loss publication http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_012756.pdf; table 36 pages 117-118, grain corn given silage rate

38 N Soil Conversion: BPJ values for lbs N released/ac/1% OM from Ginny Prest (WSDA DNMP). 2.17 % OM value is avg from Deep Soil Testing Results. Multiply 2.17 X 20lbs/acre conversion per 1%OM(Low), 35lbs (Avg), 65lbs (High)

39 Total N (Low) = (C X F) + (G X J) + (K X N) + (O + R + S+AC) - (V + AB)

40 Total N (Avg) = (D X F) + (H X J) + (L X N) + (P+ R + T+AD) - (W + AB)

41 Total N (High) = (E X F) + (I X J) + (M X N) + (Q + R + U+AE) - (X + AB)

	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1	N Crop Uptake-Low lb	N Crop Uptake-Avg lb	N Crop Uptake-Hi lb	N Removal-Low ll	N Removal-Avg	N Removal-Hi	N Loss to Atmosphere lb	N Soil Conversion-	N Soil	N Soil	Total N-Low ll	Total N-Avg	Total N-Hi	Total Crop N-Low	Total Crop N - Avg	Total Crop N -Hi		Total Crop N - Avg	Total Crop N - High
2	lbs/acre	lbs/acre	lbs/acre	lbs/acre	lbs/acre	lbs/acre	lbs/acre	lbs/acre/yr	Conversion-	Conversion-Hi	lbs/acre	lbs/acre	lbs/acre	lbs/yr	lbs/yr	lbs/yr	Total Crop N-Low tons/yr	tons/yr	tons/yr
3	80	100.0	120	40	50.0	60	17.0	43	92	141	-4.5	90.7	218.8	-78260.06261	1572956.743	3793325.482	-39.1300313	786.4783713	1896.662741
4	250	270.0	290	250	260.0	270	30.4	43	92	141	-199.6	24.8	241.8	-3349300.366	416702.131	4057703.428	-1674.650183	208.3510655	2028.851714
5	200	212.5	225	190	200.0	210	17.0	43	92	141	-135.1	-8.9	249.8	-1456118.403	-96158.44766	2692780.197	-728.0592014	-48.07922383	1346.390099
6	80	90.0	100	20	30.0	40	17.0	43	92	141	60.8	132.0	196.5	623462.3778	1353771.035	2015501.39	311.7311889	676.8855174	1007.750695
7	480	480.0	480	400	400.0	400	17.4	43	92	141	-365.1	-235.6	-46.2	-2916570.826	-1882511.415	-369437.9561	-1458.285413	-941.2557077	-184.718978
8	270	270.0	270	270	270.0	270	17.0	43	92	141	-186.0	-68.5	62.0	-1252290.605	-460798.2379	417468.5654	-626.1453023	-230.399119	208.7342827
9	60	80.0	100	25	32.5	40	17.0	43	92	141	27.5	105.3	210.4	173954.307	666914.7486	1332872.067	86.97715348	333.4573743	666.4360335
10	200	250.0	300	150	200.0	250	17.0	43	92	141	-83.9	77.7	113.0	-500135.3937	463408.9917	673406.6763	-250.0676968	231.7044959	336.7033382
11	50	57.5	65	15	22.5	30	17.0	43	92	141	40.1	93.8	156.0	205604.314	480793.624	799861.494	102.802157	240.396812	399.930747
12	80	120.0	160	40	50.0	60	17.0	43	92	141	-1.3	91.9	172.8	-4178.028845	306096.9599	575682.4512	-2.089014422	153.0484799	287.8412256
13	280	300.0	320	280	280.0	280	17.0	43	92	141	-165.7	72.9	156.6	-234931.2379	103368.1121	222047.6221	-117.465619	51.68405604	111.023811
14	275	275.0	275	187	187.0	187	17.9	43	92	141	-79.2	22.6	113.0	-101613.9039	28976.39223	144991.5261	-50.80695195	14.48819611	72.49576305
15	290	307.5	325	170	180.0	190	30.4	43	92	141	-47.6	126.2	283.7	-55544.19456	147168.2052	330739.9454	-27.77209728	73.58410261	165.3699727
16	50	50.0	50	20	20.0	20	17.0	43	92	141	57.9	156.7	210.2	49472.22	133800.45	179510.8	24.73611	66.900225	89.7554
17	95	95.0	95	50	50.0	50	17.0	43	92	141	12.5	81.0	158.1	10529.76344	68317.32914	133287.4234	5.264881721	34.15866457	66.64371172
18												Total lbs N all crops:		-8885920.039	3302806.62	16999741.11	-4442.960019	1651.40331	8499.870556
19											ROUNDED NUMBERS FOR TABLE								
20											Total N-Low ll	Total N-Avg	Total N-Hi	Total Crop N-Low	Total Crop N - Avg	Total Crop N -Hi		Total Crop N - Avg	Total Crop N - High
21											lbs/acre	lbs/acre	lbs/acre	lbs/yr	lbs/yr	lbs/yr	Total Crop N-Low tons/yr	tons/yr	tons/yr
22									Apple		-5	91	219	-78260	1572957	3793325	-39	786	1897
23									Corn (Silage)		-200	25	242	-3349300	416702	4057703	-1675	208	2029
24									Triticale		-135	-9	250	-1456118	-96158	2692780	-728	-48	1346
25									Grapes (Juice)		61	132	197	623462	1353771	2015501	312	677	1008
26									Alfalfa*		-365	-236	-46	-2916571	-1882511	-369438	-1458	-941	-185
27									Pasture		-186	-68	62	-1252291	-460798	417469	-626	-230	209
28									Cherry		27	105	210	173954	666915	1332872	87	333	666
29									Hops		-84	78	113	-500135	463409	673407	-250	232	337
30									Grapes (Wine)		40	94	156	205604	480794	799861	103	240	400
31									Pear		-1	92	173	-4178	306097	575682	-2	153	288
32									Mint		-166	73	157	-234931	103368	222048	-117	52	111
33									Wheat		-79	23	113	-101614	28976	144992	-51	14	72
34									Corn (Grain)		-48	126	284	-55544	147168	330740	-28	74	165
35									Asparagus		58	157	210	49472	133800	179511	25	67	90
36									Peach/Nectarine		12	81	158	10530	68317	133287	5	34	67
37														**-8885920**	**3302807**	**16999741**	**-4443**	**1651**	**8500**
38																			
39																			
40																			
41																			