United States Department of Agriculture

INVESTING IN OREGON SOILS

SOIL TOUCHES ALL OUR LIVES. NUTRITIOUS FOOD, FRESH AIR, AND CLEAN WATER ALL START WITH HEALTHY SOIL.

The USDA Natural Resources Conservation Service (NRCS) helps farmers, ranchers, and forestland owners perform conservation activities that enrich Oregon's living and life-giving soil.

High functioning soils are measured by their ability to cycle nutrients, store carbon, promote root growth, reduce erosion, and hold water. When soils are healthy, farms, ranches and forests are more resilient to drought and other weather extremes, yields are more stable, and they're less prone to disease and pest problems.

NRCS is committed to high functioning soils in Oregon because we're committed to a high functioning Oregon. Our crops, grazing land, forests, and economy depend on it.

Embracing change

Oregon's wheat country, an area stretching along the Columbia River from Wasco to Umatilla County, is a transformed landscape compared to the 1990s. Around that time, poor wheat prices, environmental pressures, and extreme erosion were pushing farms to the brink.

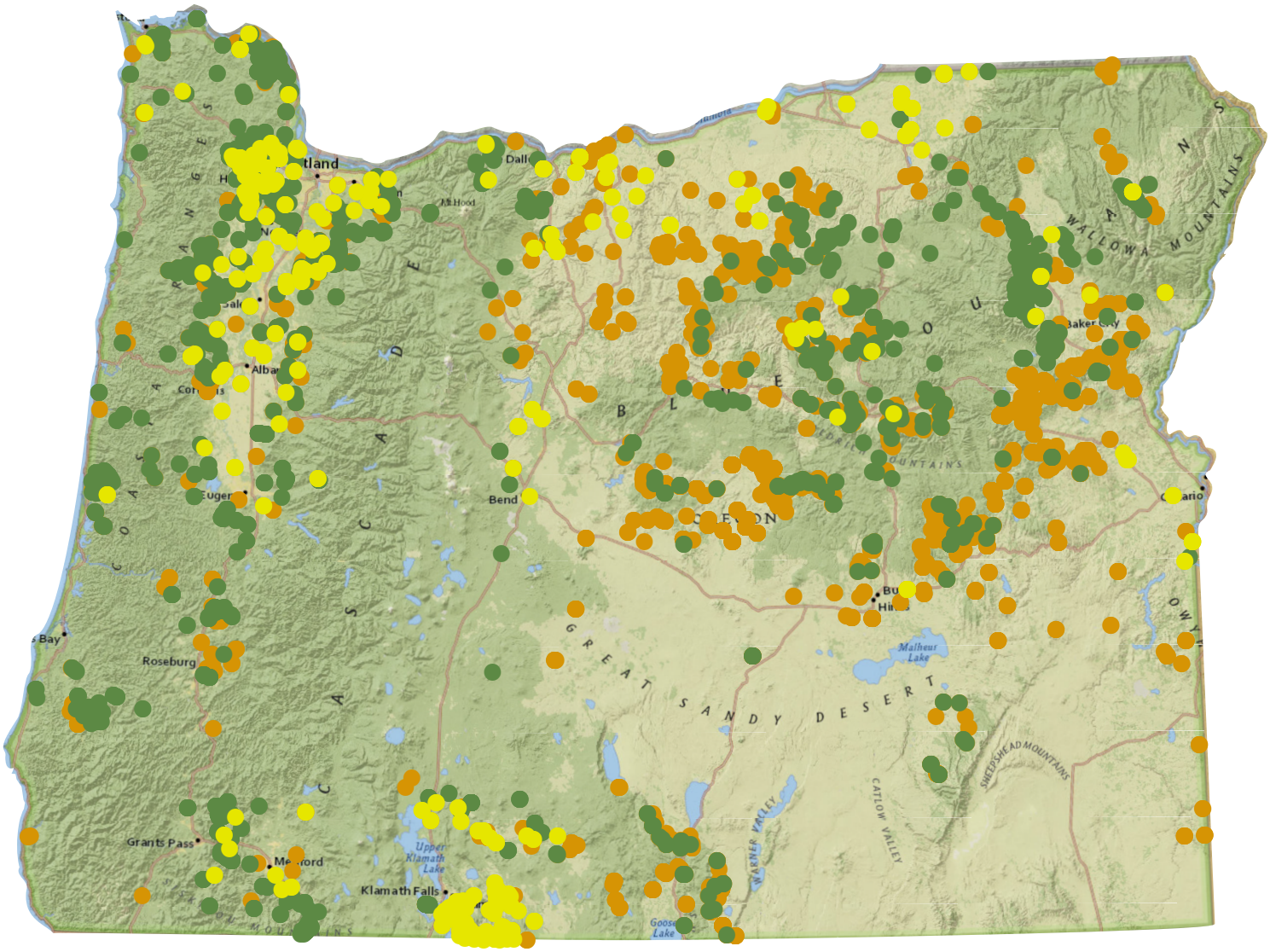
Farmers embraced a new kind of farming. Switching from the plow to direct seed saved money on fuel, allowed the soil to hold more water for longer, and virtually stopped erosion. By 1995, over 205,000 acres or 93 percent of cropland in Wasco County had gone direct seed.

It was the beginning of a soil health wave across Oregon that is restoring the life and function of our soils and making Oregon's farms, ranches, and forests more resilient to the challenges that lie ahead.

SOIL HEALTH EQIP CONTRACTS BY COUNTY
1997-2017

	CROP ROTATION	NO-TILL AND REDUCED TILL	COVER CROPS	WOODY RESIDUE TREATMENT	TREE AND SHRUB ESTABLISHMENT	TREE AND SHRUB PRUNING	FOREST STAND IMPROVEMENT	BRUSH MANAGEMENT/ WEED CONTROL	PRESCRIBED BURNING	CRITICAL PLANTING	PRESCRIBED GRAZING	RANGE PLANTING
BAKER	8	1	5	261	149	0	238	406	4	162	392	58
BENTON	40	270	26	16	31	0	29	95	1	4	125	0
CLACKAMAS	9	42	90	51	62	12	81	33	18	7	54	0
CLATSOP	0	0	6	13	33	0	26	33	4	3	127	0
COLUMBIA	56	0	21	52	59	0	85	43	0	12	126	1
COOS	0	0	0	44	74	7	171	73	0	9	170	0
CROOK	47	0	0	29	6	0	18	571	0	0	181	22
CURRY	8	0	1	0	62	0	32	4	0	0	49	0
DESCHUTES	24	0	4	15	11	6	19	15	0	2	66	3
DOUGLAS	0	2	0	58	287	0	403	278	0	61	507	2
GILLIAM	431	197	9	15	89	0	7	86	9	0	202	58
GRANT	0	0	17	193	30	1	111	485	8	0	245	147
HARNEY	171	0	2	291	110	0	8	662	0	9	529	23
HOOD RIVER	0	0	10	286	0	0	1	0	0	2	0	0
JACKSON	2	0	17	249	32	171	344	9	4	7	129	0
JEFFERSON	228	13	12	0	4	0	5	51	1	9	113	6
JOSEPHINE	0	0	0	14	5	8	16	0	0	0	12	0
KLAMATH	877	233	297	104	34	0	130	146	0	25	586	30
LAKE	31	0	0	129	4	0	9	384	0	2	314	22
LANE	60	186	18	100	164	21	183	154	0	0	611	5
LINCOLN	0	0	0	2	14	0	20	7	0	1	107	1
LINN	149	117	28	26	48	0	54	181	1	2	158	9
MALHEUR	243	10	37	18	4	0	1	239	0	1	222	33
MARION	87	110	111	1	55	1	14	150	6	22	23	0
MORROW	374	276	26	80	57	0	95	95	4	3	356	51
MULTNOMAH	17	31	35	12	20	0	46	24	0	2	5	0
POLK	19	69	61	29	121	7	136	175	2	4	53	9
SHERMAN	453	516	0	0	20	0	0	472	0	15	404	107
TILLAMOOK	0	0	0	0	13	0	2	1	0	0	1880	0
UMATILLA	542	192	134	22	55	2	46	41	0	8	482	30
UNION	356	192	134	22	55	2	46	41	0	8	482	30
WALLOWA	580	139	41	41	22	0	44	62	0	1	420	19
WASCO	923	686	62	29	30	0	41	162	1	44	386	70
WASHINGTON	186	348	321	16	158	1	214	74	0	47	72	0
WHEELER	9	1	0	44	21	0	26	179	27	0	175	99
YAMHILL	31	357	123	62	138	2	128	152	0	4	112	0

SOIL HEALTH PRACTICE DISTRIBUTION
ACROSS OREGON, 2009-2016



CROPLAND
Practices

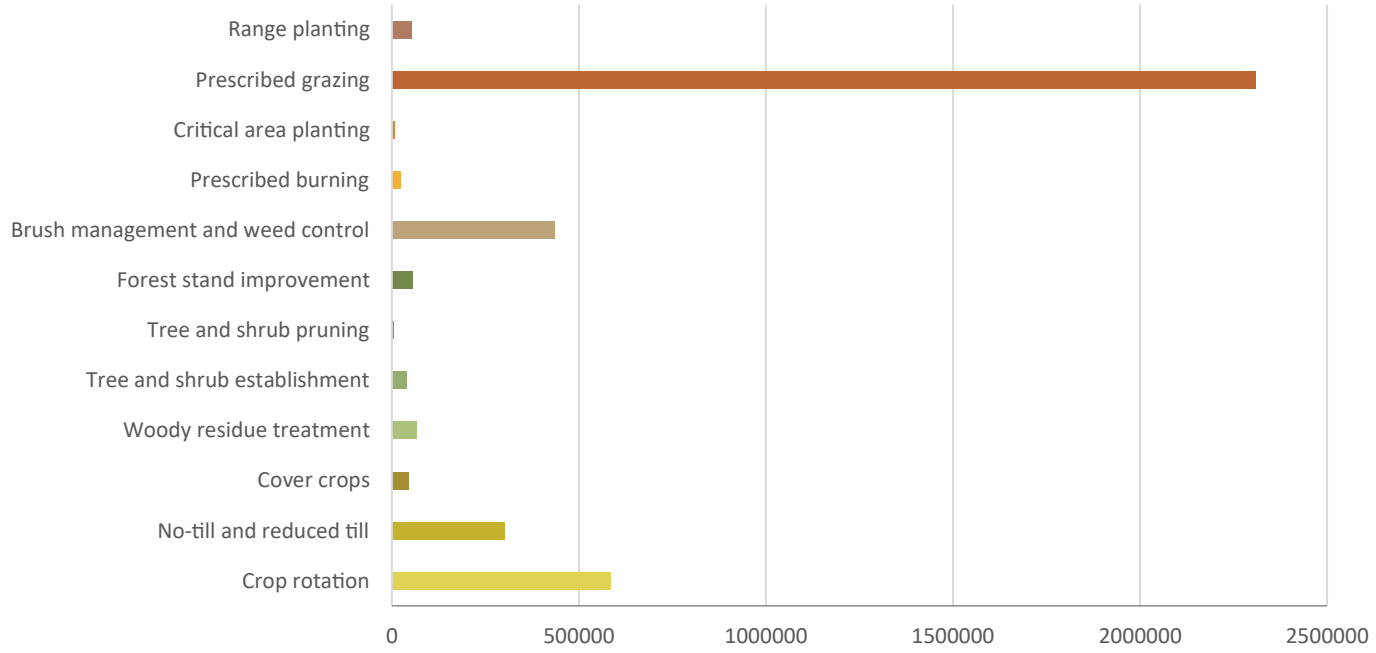
FOREST
Practices

RANGE
Practices

A PICTURE OF HEALTHY SOIL ACROSS OREGON
Map source: National Geographic, Esri

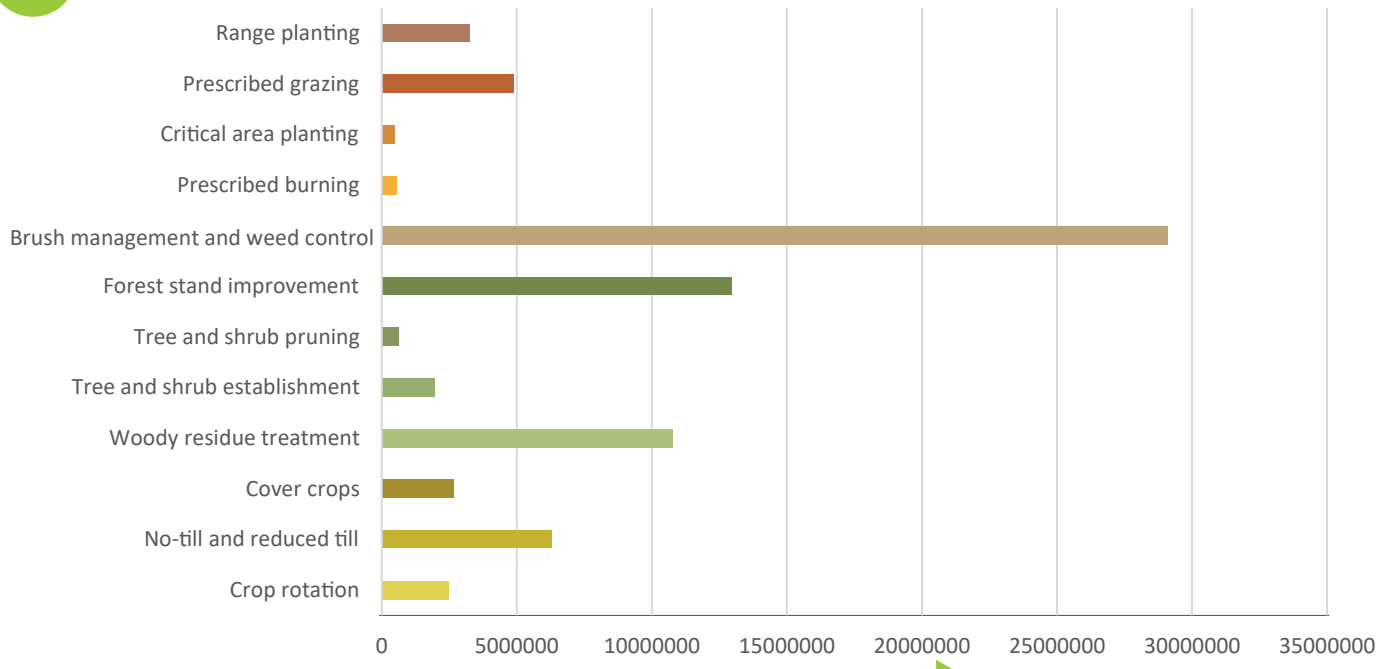
TOTAL SOIL HEALTH EQIP INVESTMENT
1997-2017

ACRES Enrolled in EQIP by Soil Health Practice



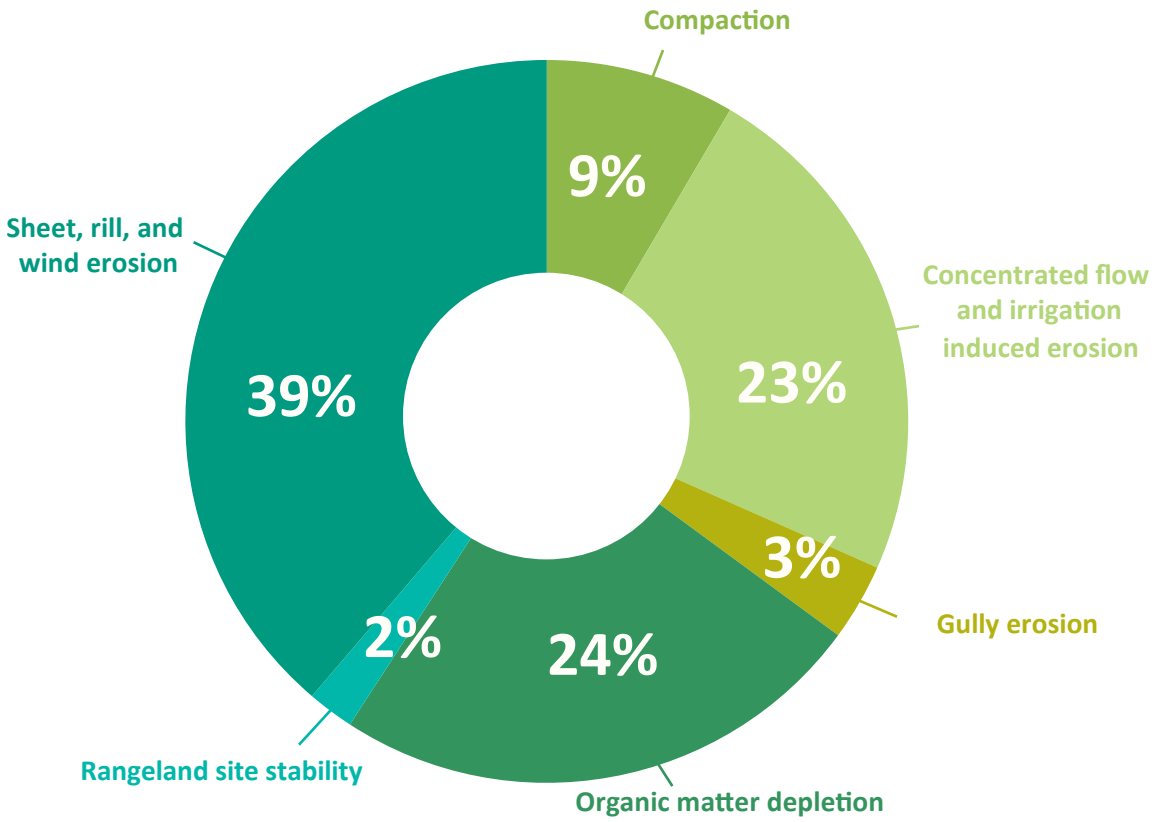
TOTAL acres enrolled: 39,236,24.5

TOTAL INVESTMENT in EQIP by Soil Health Practice



TOTAL investment: $76,032,644.35

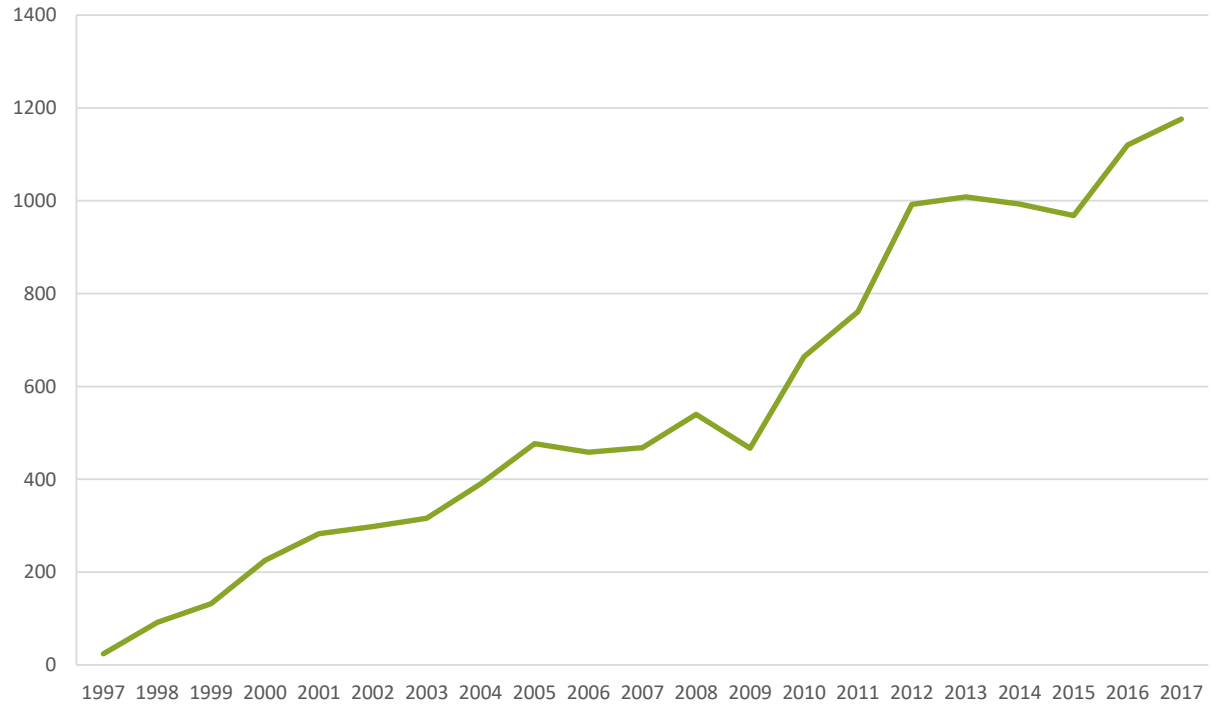
EQIP INVESTMENT in Soil Health Resource Concerns 1997-2017



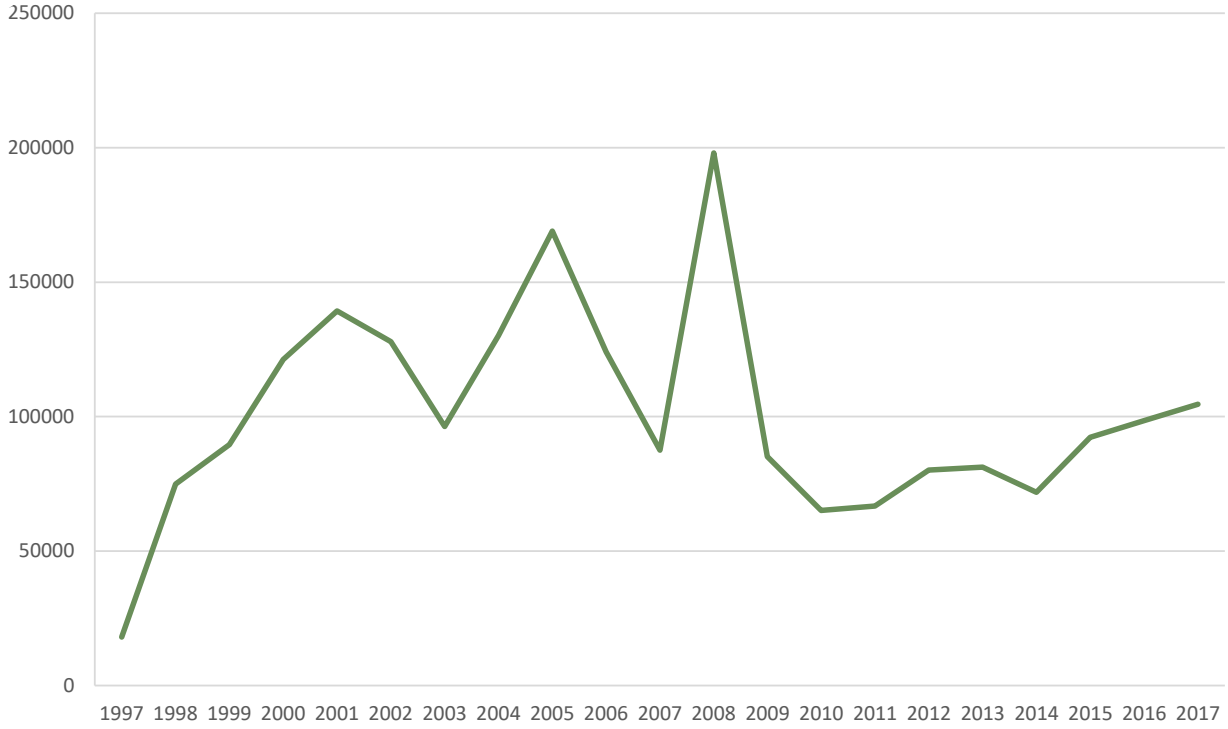
EQIP CONTRACTS Featuring Soil Health Practices 2009-2016

TOTAL SOIL HEALTH CONTRACTS AND ACRES
1997-2017

NEW Soil Health EQIP Contracts



ACRES enrolled in EQIP Soil Health Practices



BUILDING HIGH FUNCTIONING SOILS IS AS STRAIGHTFORWARD AS FOLLOWING FOUR PRINCIPLES:

1. Avoid soil disturbance wherever and when ever possible.
2. Maximize soil cover with living plants and residue.
3. Maximize biodiversity by growing a variety of plants and managed integration of livestock.
4. Maximize living roots in the soil throughout the year.

12 CONSERVATION PRACTICES
for high functioning soil

For the purposes of this analysis, NRCS has identified 12 conservation practices that strongly align with the principles of high functioning soils. NRCS has worked with farmers, ranchers, and forestland owners to implement these practices across Oregon. Analysis was run on EQIP contracts containing these practices.

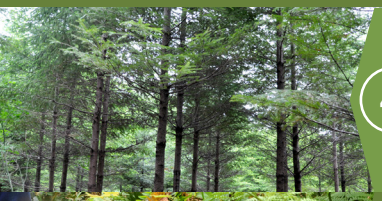
CROPLAND

1. **CROP ROTATION:** Growing a planned sequence of various crops on the same land increases residue on the soil surface and soil organic matter, including carbon. This practice can also reduce erosion and break insect, disease, and weed cycles.

2. **RESIDUE AND TILLAGE MANAGEMENT:** This practice encompasses two approaches, reduced till and no-till. In either case, soil disturbance is reduced, preserving soil structure, organic matter, and aeration. Reduced tillage methods involve tilling the entire soil surface with equipment that does not invert or "turn over" the soil surface. In no-till, strip till, and direct seed operation, only a very narrow strip is tilled to allow seed to soil contact.

3. **COVER CROP:** These crops are grown for soil protection and improvement rather than immediate profit. They keep soil covered, increase plant diversity, maintain leaving roots in the soil, build soil structure, and return nutrients to the soil.

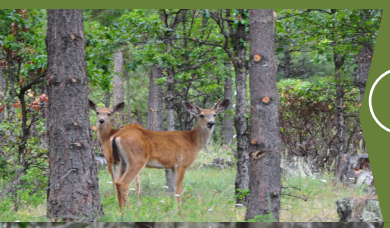
FORESTLAND



4. **WOODY RESIDUE TREATMENT:** Cutting and scattering woody residue from forestry activities or natural disasters keeps soil covered. It can also increase soil organic matter. Additional benefits include reduced wildfire, insect, and disease risks.

5. **TREE AND SHRUB ESTABLISHMENT:** Planting trees and shrubs keeps soil covered, increases biodiversity, and maintains living roots throughout the year. This practice can also lead to increased carbon storage and energy conservation.

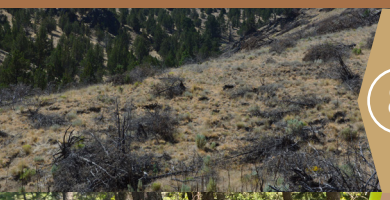
FORESTLAND



6. **TREE AND SHRUB PRUNING**: Removing damaged or unhealthy branches and shoots can increase overall forest health. Pruned material is often left on site as residue that contributes to soil cover and soil organic matter.

7. **FOREST STAND IMPROVEMENT:** This practice involves removing selected trees and understory vegetation to increase overall plant diversity and improved root structure of remaining plants.

RANGELAND



8. **BRUSH MANAGEMENT AND WEED CONTROL:** Removing exotic or invasive woody and herbaceous species promotes diversity on the range and improves the health of native plant groups. Diverse plant groups maintain living roots throughout the year and increase soil carbon.

9. **PRESCRIBED BURNING:** This highly specialized practice requires intensive training and support, but the results can be transformative. In fire-adapted ecosystems, fire promotes long term diversity of range plant groups and stimulates native species. This in turn increases overall biodiversity.

10. **CRITICAL AREA PLANTING:** Establishing permanent vegetation can drastically reduce erosion. Soil health benefits include year-round soil protection, biodiversity, and robust root systems that increase soil carbon.

11. **PRESCRIBED GRAZING:** Intensively managing the movements and grazing habits of livestock protects soil and allows desirable vegetation to compete with invasives. The practice allows for rest periods between grazing to allow plant communities to recover, resulting in greater biodiversity, reduced soil disturbance, and more living roots.

12. **RANGE PLANTING:** establishing perennial vegetation on grazing land introduces or reintroduces biodiversity to site, resulting in increased soil protection and healthy plant communities with carbon fixing living roots throughout the year.

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2005-2017 data provided by NRCS Resource Economic and Analysis Division (REAP).
1997-2004 data provided by NRCS Program Contracts System (ProTracts).