NRCS Practices

These practices have been identified by CDFA as sequestering Carbon and are eligible for Grazing Lands.

Ariel De Lara – District Conservationist, Salinas, CA

Quick Program Description

USDA – NRCS: Environmental Quality Incentive Program (EQIP) and Conservation Stewardship Program (CSP).

CDFA – Healthy Soils Program (adapted NRCS codes/practice descriptions but there are some differences in specifications)

Compost to Rangelands

- Soil Carbon Amendment (808)
  - $83/ac. to $245/ac.
  - Improve Plant Productivity and Health
  - Improve Soil Health (Soil agg stability, habitat for soil organisms, increase OM)
  - Not for use on “native grasslands” or other areas where a change in plant community would be undesirable.

Compost to Rangelands

- Soil Carbon Amendment (808) NRCS Requirements
  - Pre Contract – In-Field Soil health assessment. Soil test documenting SOC.
  - Material Requirements – Compost: C:N Ratio>10:1 and 40% - 60% moisture at maturity. Biochar: country of origin, production method, OC, ash, NPK, EC, and pH of final material. If excess of 100lbs N/ac. Is applied, 590 nutrient management must take place.
  - Installation Req's – Single application in the fall. Slopes cannot exceed 8%.

Compost to Rangelands

Ecosystems (2013) 16: 962–979
DOI: 10.1007/s10021-013-9660-5

ECOSYSTEMS

A Lifecycle Model to Evaluate Carbon Sequestration Potential and Greenhouse Gas Dynamics of Managed Grasslands

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Abstract

Soil amendments can increase net primary productivity (NPP) and soil carbon (C) sequestration in grasslands, but the net greenhouse gas fluxes of amendments such as manure, compost, and inorganic fertilizers remain unclear. To evaluate opportunities for climate change mitigation through soil amendment applications, we designed a field-scale model that quantifies greenhouse gas emissions (CO_2, CH_4, and N_2O) from the production, application, and ecosystem response of soil amendments. Using this model, we developed a set of case studies for grazed annual grasslands in California. Sensitivity tests were performed to explore the impacts of model variables and management options. We conducted Monte Carlo simulations to provide estimates of the potential error associated with variables where literature data were sparse or spanned wide ranges. In the base case scenario, application of manure slurries led to net emissions of 14 Mg CO_2e ha^{-1} over a 3-year period. Inorganic N fertilizer resulted in lower greenhouse gas emissions than the manure (3 Mg CO_2e ha^{-1}), assuming equal rates of N addition and NPP response. In contrast, composted manure and plant waste led to large offsets that exceeded emissions, saving 23 Mg CO_2e ha^{-1} over 3 years. The diversion of both feedstock materials from traditional high-emission waste management practices was the largest source of the offsets; secondary benefits were also achieved, including increased plant productivity, soil C sequestration, and reduced need for commercial feeds. The greenhouse gas saving rates suggest that compost amendments could result in significant offsets to greenhouse gas emissions, amounting to over 28 MMg CO_2e when scaled to 5% of California rangelands. We found that the model was highly sensitive to manure and landfill management factors and less dependent on C sequestration, NPP, and soil greenhouse gas effluxes. The Monte Carlo analyses indicated that compost application to grasslands is likely to lead to net greenhouse gas offsets across a broad range of potential environmental and management conditions. We conclude that applications of composted organic matter to grasslands can contribute to climate change mitigation while sustaining productive lands and reducing waste loads.

Key words: annual grasslands; compost; greenhouse gas emission factors; fertilizer; global warming potential; rangelands.

Received 24 July 2012; accepted 25 February 2013;
published online 16 April 2013

Electronic supplementary material: The online version of this article (doi:10.1007/s10021-013-9660-5) contains supplementary material, which is available to authorized users.

Author Contributions: MSD designed the study, performed research, and wrote the paper. RAR contributed data and expertise and provided input on the manuscript. WLS conceived of the study and contributed to research and manuscript development.

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Compost to Rangelands

Prescribed Grazing (528)

- Managing the harvest of vegetation with grazing and/or browsing animals with the intent to achieve specific ecological, economic, and management objectives.
- Typically a part of EQIP. The management practice required to justify fence (382), livestock water systems (516, 614, 533, 642, 574).
- Typically contracted to increase grazing distribution within fields effected by newly installed infrastructure.
- This practice can take many shapes and forms through CSP. Contact local field office for more opportunities.

Prescribed Grazing (528)

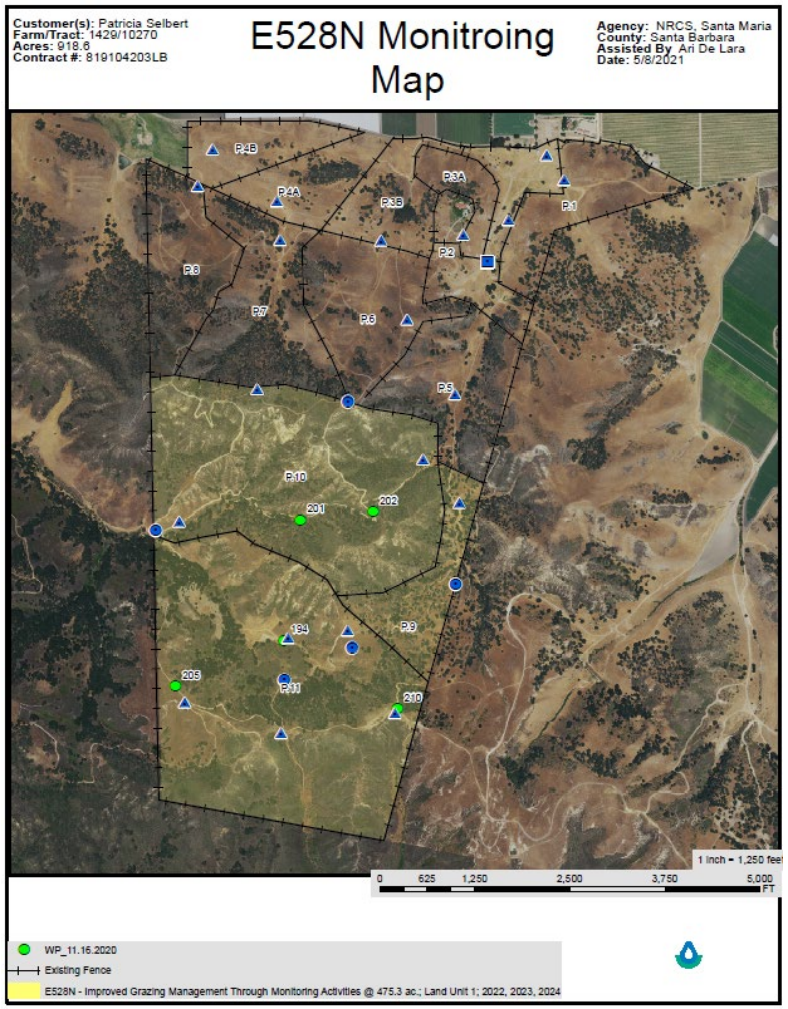
- Additional Purposes
  - Improve or maintain desired species composition, structure and/or vigor of plant communities
  - Improve or maintain quantity and/or quality of forage for grazing and browsing animals' health and productivity
  - Improve or maintain surface and/or subsurface water quality and/or quantity
  - Improve or maintain riparian and/or watershed function
  - Reduce soil erosion, and maintain or improve soil health
  - Improve or maintain the quantity, quality, or connectivity of food and/or cover available for wildlife
  - Manage fine fuel loads to achieve desired conditions

Prescribed Grazing (528)

Patricia Selbert						
Feed and Forage Balance						
Field: Number - Name	AUM Demand	AUM Available	AUM Balance	Supplemental Feed in AUM's	Forage Balance	RDM Observed
P. 1	63.4	30.6	-32.8			750
P. 2	14.6	42.8	28.2			750
P. 3A	8	5.5	-2.5			500
P. 3B	10.6	16.9	6.3			750
P. 4A	14.8	10.3	-4.5			750
P. 4B	13.3	11.3	-2			750
P. 5	20	36.9	16.9			750
P. 6	38.1	36.5	-1.6			>1,000
P. 7	24.1	27.2	3.1			750
P. 8	38.1	13.9	-24.2			750
P. 9	19.6	29.2	9.6			500
P. 10	33	49.1	16.1			750
P. 11	86.6	164	77.4			>1,00
Total	384.2	474.2	90	n/a	90	

Patricia Selbert - Grazing Records										
Field	Dates	Bonzmaras	0.7 AUM	Stockers	1.0 AUM	Bulls	1.35 AUM	Duration in months 1 month = 30 days	AUM Demand per Grazing event	AUM Demand per year
1	7/28/2020 - 8/21/2020	19	13.3	0	0	0	0	0.8	10.64	
1	12/22/2020 - 1/13/2021	21	14.7	30	30	0	0	0.7	31.29	
1A	2/22/2020 - 2/28/2020	20	14	0	0	0	0	0.2	2.8	
1A	3/1/2020 - 3/15/2020	19	13.3	0	0	0	0	0.5	6.65	
1B	3/16/2020 - 3/27/2020	19	13.3	0	0	0	0	0.4	5.32	
1C	3/28/2020 - 4/12/2020	19	13.3	0	0	0	0	0.5	6.65	63.35
2	7/25/2020 - 7/27/2020	19	13.3	0	0	0	0	0.1	1.33	
2A	4/13/2020 - 6/9/2020	19	13.3	0	0	0	0	0.9	11.97	
2B	8/22/2020 - 8/25/2020	19	13.3	0	0	0	0	0.1	1.33	14.63
3A	8/26/2020 - 9/15/2020	19	13.3	0	0	0	0	0.6	7.98	7.98
3B	9/16/2020 - 9/29/2020	21	14.7	0	0	0	0	0.4	5.88	
3B	1/14/2021 - 1/16/2021	21	14.7	30	30	0	0	0.1	4.47	10.35
4A	10/20/2020 - 11/10/2020	21	14.7	0	0	0	0	0.7	10.29	
4A	1/17/2021 - 1/19/2021	21	14.7	30	30	0	0	0.1	4.47	14.76
4B	9/30/2020 - 10/19/2020	21	14.7	0	0	0	0	0.6	8.82	
4B	1/20/2021 - 1/22/2021	21	14.7	30	30	0	0	0.1	4.47	13.29
5	6/10/2020 - 7/24/2020	19	13.3	0	0	0	0	1.5	19.95	19.95
6	5/14/2020 - 6/21/2020	0	0	28	28	0	0	1.2	33.6	
6	1/29/2021 - 1/31/2021	21	14.7	30	30	0	0	0.1	4.47	38.07
7	6/22/2020 - 7/14/2020	0	0	28	28	0	0	0.7	19.6	
7	1/27/2021 - 1/29/2021	21	14.7	30	30	0	0	0.1	4.47	24.07
8	7/15/2020 - 8/20/2020	0	0	28	28	0	0	1.2	33.6	
8	1/22/2021 - 1/26/2021	21	14.7	30	30	0	0	0.1	4.47	38.07
9	8/21/2020 - 9/11/2020	0	0	28	28	0	0	0.7	19.6	19.6
10	9/12/2020 - 10/15/2020	0	0	30	30	0	0	1.1	33	33
11	10/16/2020 - 11/10/2020	0	0	30	30	0	0	0.8	24	
11	11/11/2020 - 12/22/2020	21	14.7	30	30	0	0	1.4	62.58	86.58

Prescribed Grazing (528)



Prescribed Grazing (528)

RANGELAND MONITORING SERIES PUBLICATION 8092

Guidelines for Residual Dry Matter on Coastal and Foothill Rangelands in California

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Residual dry matter (RDM) is a standard used by land management agencies for assessing the level of grazing use on annual rangeland and associated savannas and woodlands (George et al. 1996). RDM is the old herbaceous plant material left standing or on the ground at the beginning of a new growing season. It indicates the combined effects of the previous season's forage production, breakdown over summer, and its consumption by grazing animals of all types. The standard assumes that the amount of RDM remaining in the fall, subject to site conditions and variations in weather, will influence subsequent species composition and forage production.

Properly managed RDM can be expected to provide a high degree of protection from soil erosion and nutrient losses. Applications of specific RDM standards based on a limited research base and on experience have demonstrated the effectiveness of this approach to grazing management. Because of the limited amount of research information, standards and score cards normally have to be developed using local experience and general guidelines such as those that appear in this publication. Numerous agencies have successfully applied the RDM-based method for managing grazing intensity over the past 20 years. Some examples are the Bureau of Land Management and the Natural Resources Conservation Service (BLM 1999), the National Park Service (Shook 1990), the U.S. Forest Service (USDA Forest Service 1997), and the San Joaquin Experimental Range (Frost et al. 1988).

Table 1. Minimum RDM standards for dry annual grassland in pounds per acre (dry weight)

Woody cover (%)	RDM standard for percent slope (lb/acre) 0–10	10–20	20–40	>40
0–25	300	400	500	600
25–50	300	400	500	600
50–75	NA	NA	NA	NA
75–100	NA	NA	NA	NA

Note: Metric conversion: 1 lb/acre = 1.12 kg/ha.

Table 2. Minimum RDM standards for annual grassland/hardwood rangeland in pounds per acre (dry weight)

Woody cover (%)	RDM standard for percent slope (lb/acre) 0–10	10–20	20–40	>40
0–25	500	600	700	800
25–50	400	500	600	700
50–75	200	300	400	500
75–100	100	200	250	300

Note: Metric conversion: 1 lb/acre = 1.12 kg/ha.

Table 3. Minimum RDM standards for coastal prairie in pounds per acre (dry weight)

Woody cover (%)	RDM standard for percent slope (lb/acre) 0–10	10–20	20–40	>40
0–25	1,200	1,500	1,800	2,100
25–50	800	1,000	1,200	1,400
50–75	400	500	600	700
75–100	200	250	300	350

Note: Metric conversion: 1 lb/acre = 1.12 kg/ha.

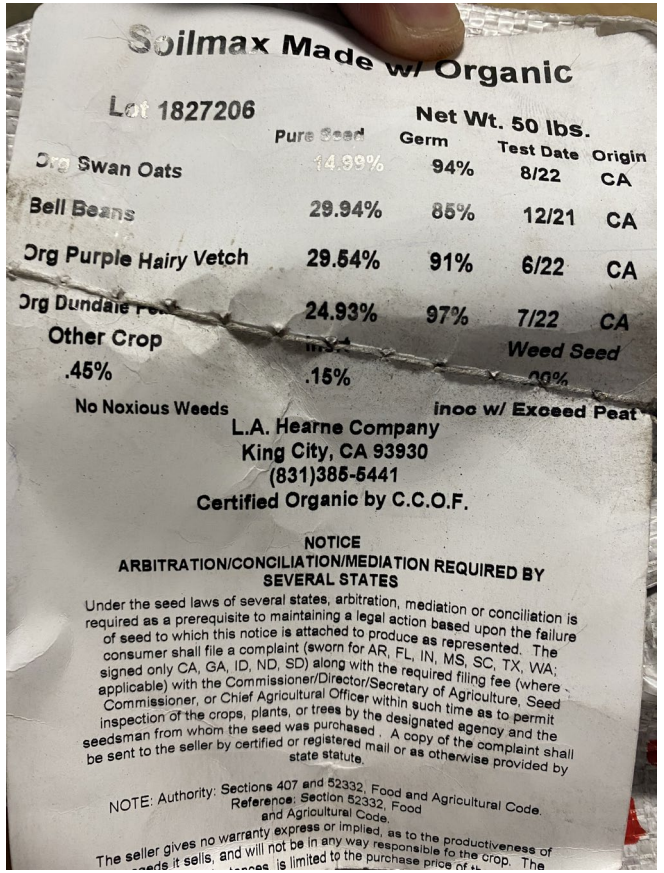
Range Planting (550)

- Establishment of self- sustaining vegetation such as grasses, forbs, legumes, shrubs and trees.
- FY 22 rates from $95/ac. (non-native) to $294/ac. (native)
- Typically at least 20 lbs per acre of PLS. Can be drilled or broadcast.
- Standard forage/livestock mixes generally fit NRCS requirements.
- Other site prep requirements include measures to include seed to soil contact.

Range Planting (550)

- Restore a plant community similar to the Ecological Site Description reference state for the site or the desired plant community.
- Provide or improve forages for livestock.
- Provide or improve forage, browse or cover for wildlife.
- Reduce erosion by wind and/or water.
- Improve water quality and quantity.
- Increase carbon sequestration

Range Planting (550)



Planting Practices – Windbreak/Shelterbelt Est. (380), Riparian Forest Buffer (391), Hedgerow (422), Tree/Shrub Est. (612)

- Establishing woody plants by planting seedlings or cuttings, by direct seeding, and/or through natural regeneration.
- Tree/Shrub est practice code is most applicable for this area/county.
- In addition to introducing new plants (from small cuttings up to 5 gal potted plants) NRCS also offers payments for installing browse protection around naturally occurring seedlings.
- Most planting practices will require irrigation. This can be temporary drip for 2-3 years to ensure establishment.

Planting Practices – Windbreak/Shelterbelt Est. (380), Riparian Forest Buffer (391), Hedgerow (422), Tree/Shrub Est. (612)

- Practice/component spotlight
  - Tree/shrub est. – Conservation, Naturally occurring seedlings, Protected
  - FY22 payment rate of $18.18/tree
  - Wire cages set in place around trees/shrubs large enough for 5 – 10 years of growth.
  - Cages typically 4 ft tall, 3 ft dia., 2x4” wire mesh fencing staked in place w/2 metal t-posts.
  - Materials: wire mesh is 12.5 gauge, galvanized, 48”. T-posts are steel, studded, 6ft tall set 2ft in the ground, 1.33 pounds per foot.

Planting Practices – Windbreak/Shelterbelt Est. (380), Riparian Forest Buffer (391), Hedgerow (422), Tree/Shrub Est. (612)

- Maintain or improve desirable plant diversity, productivity, and health by establishing woody plants
- Create or improve habitat for desired wildlife species compatible with ecological characteristics of the site
- Control erosion
- Improve water quality. Reduce excess nutrients and other pollutants in runoff and groundwater.
- Sequester and store carbon
- Restore or maintain native plant communities
- Conserve energy
- Provide for beneficial organisms and pollinators
- Reduce soil erosion from wind
- Enhance plant health and productivity by protecting plants from wind-related damage

Planting Practices – Windbreak/Shelterbelt Est. (380), Riparian Forest Buffer (391), Hedgerow (422), Tree/Shrub Est. (612)

Silvopasture (381)

- Establishment and/or management of desired trees and forages on the same land unit.
- Tree species suitable under NRCS practice standards are typically conifer trees.
- Only viable, high quality, planting stock or seed will be used. The planting shall be done at a time and manner to ensure survival and growth of selected species.
- Establish and maintain silvopasture in a forested condition that is at least 10-percent stocked by single-stemmed woody species of any size that will be at least 4 meters (13 feet) tall at maturity.
- Establish Trees, existing grasses FY22 payment rate $160.59/ac.

Silvopasture (381)

- Provide forage, shade, and/or shelter for livestock
- Improve the productivity and health of trees/shrubs and forages
- Improve water quality
- Reduce erosion
- Enhance wildlife habitat
- Improve biological diversity
- Improve soil quality
- Increase carbon sequestration and storage
- Provide for beneficial organisms and pollinators