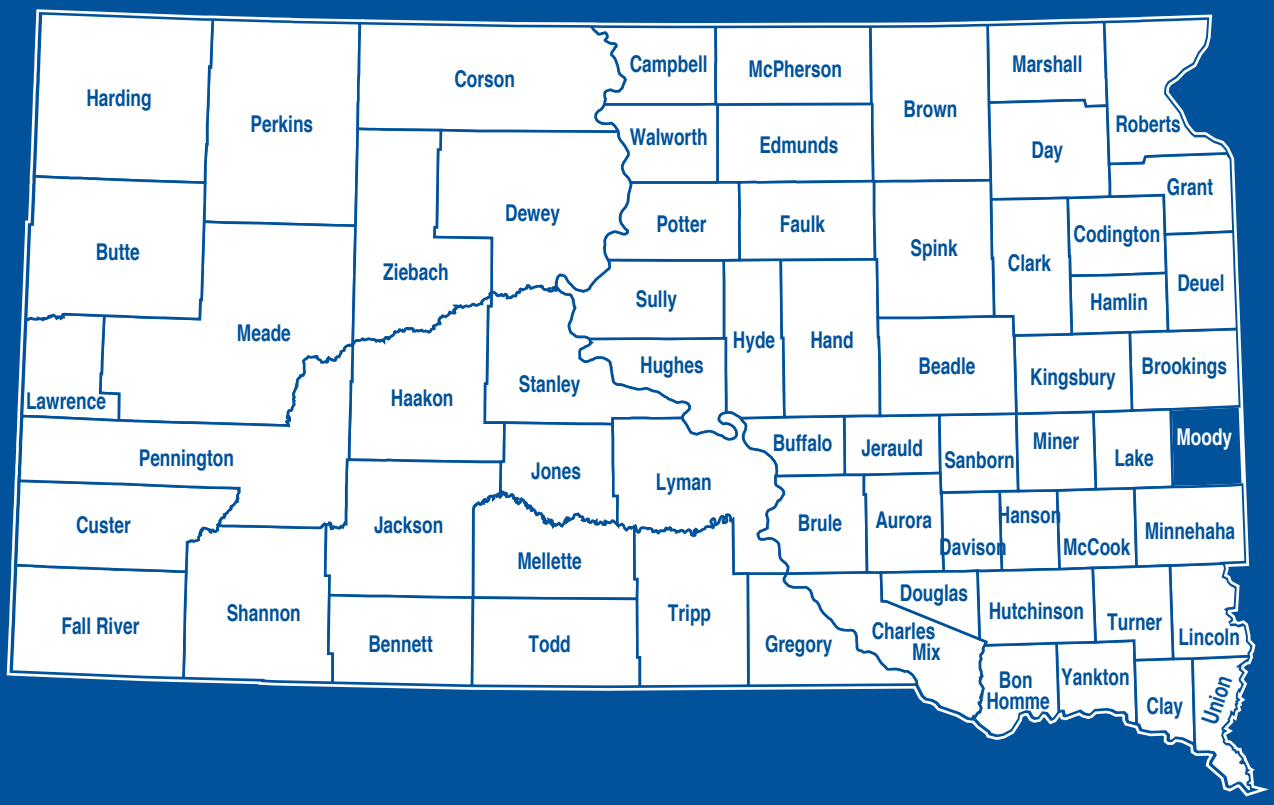
2011

Soil Productivity Ratings and Estimated Yields for Moody County, South Dakota

D. D. Malo

TB101



Soil Productivity Ratings and Estimated Yields for Moody County, South Dakota

South Dakota State University
Agricultural Experiment Station

CONTENTS

Page

INTRODUCTION 1

DATA 2

METHODS 2

YIELD and SOIL PRODUCTIVITY RATING RESULTS 2

SUMMARY 5

LITERATURE CITED 6

TABLE 1 (Moody County, South Dakota, Yield Information and Soil Productivity Ratings) . . 8

ABBREVIATIONS USED IN TABLE 1. 16

APPENDIX TABLE A1 (Forage Value Ratings for South Dakota Range Plants) 17

ACKNOWLEDGEMENT

The author thanks USDA-NRCS staff and SDSU colleagues for their review of the manuscript and Dr. Alexander 'Sandy' Smart for his review of the forage value ratings used in this publication.

South Dakota State University
Agricultural Experiment Station

This publication and others can be accessed electronically from the SDSU College of Agriculture & Biological Sciences publications page, which is at http://www.sdstate.edu/sdces/store/Publications/index.cfm.

The direct PDF download is at http://pubstorage.sdstate.edu/AgBio_Publications/articles/TB101.pdf.

TB101: PDF. April 2011

Soil Productivity Ratings and Estimated Yields for Moody County, South Dakota[1]

D.D. Malo[2]

INTRODUCTION

Soils may be thick or thin, stony or non-stony, salty or non-salty, sandy or clayey or of medium texture, sloping or flat or in basins, well drained or very poorly drained, and may occur where climates are moist or dry and warm or cool. Soil variability affects soil behavior, including what crops can be grown and what yields of crops, timber, and grass (range) can be expected.

Soil maps like those in modern detailed soil surveys and available online in Web Soil Survey (Soil Survey Staff, 2011a) show where various soils and soil mapping units occur (Malo, 2008). Soil mapping units are defined in terms of a national soil classification system, *Soil Taxonomy* (Soil Survey Staff, 1999) and *Keys to Soil Taxonomy* (Soil Survey Staff, 2010).

The basic unit of soil classification is the soil series. Two soil series examples are the Moody series and the Talmo series. Moody is defined as having a very deep, permeable, well-to-moderately-well-drained, silty profile, generally on nearly level to moderately sloping upland landscapes (Moody Official Series Description [Soil Survey Staff, 2011b]), while the Talmo series has a very deep, sandy, excessively drained, rapidly permeable profile, generally on flat outwash stream terraces or steep slopes (Talmo Official Series Description [Soil Survey Staff, 2011b]). From this brief description, one can see that the Moody soil has characteristics that would make it productive for a large number of crops, while the Talmo soil is droughty and would produce only a poor-to-fair growth of grass.

Moody County soils have been organized into 42 soil series—each of which is described in detail by the National Cooperative Soil Survey (Soil Survey Staff, 2011a; Kunze, 1989). Soil series are subdivided into *phases* to make predictions more precise. Most soil phases are made on the basis of slope, drainage, salinity, stones, or erosion (e.g., Moody-Trent silty clay loams, 0 to 2% slopes; Ethan-Egan complex, 5 to 9% slopes; Ethan-Egan complex, 2 to 9% slopes, very stony). As a result, there are 60 soil mapping units and 2 water mapping units in Moody County.

In addition to the description of its landscape and profile (i.e., a cut exposing a vertical section of the soil), each soil series and many soil phases have been observed on research fields, demonstration plots, or farm/ranch fields to determine which crops/grass grow well and what plant yields can normally be expected.

The objectives of this research:

1. Revise and update Plant Science Pamphlet 38 (Malo et al., 1990) by obtaining current crop and range yield data for each soil mapping unit in Moody County.
2. Develop a crop rating for each soil mapping unit that is suited for crops in Moody County.
3. Develop a grass/range rating for each soil mapping unit in Moody County.
4. Develop a soil productivity rating that ties together the crop and range rating productivity arrays.
5. Prepare a yield/soil productivity table and report for Moody County.

The ratings developed in this report are comparative ratings, and they apply to the soil mapping units in Moody County. The soil mapping unit ratings found in this publication are for local use and will differ somewhat from the soil mapping unit ratings in adjacent or nearby counties. The ratings in this revision may

[1]Contribution from the Plant Science Department and the South Dakota Agricultural Experiment Station, College of Agriculture and Biological Sciences, South Dakota State University, Brookings, 57007-2141. Project H-3AH163.

[2]Distinguished Professor of Pedology, Plant Science Department, College of Agriculture and Biological Sciences, South Dakota State University, Brookings, 57007-2141.

differ from the earlier 1990 version due to new yield and range information gathered since 1990.

More information, in addition to the Moody County Soil Survey (Soil Survey Staff, 2011a; Kunze, 1989), about the extent and productivity of each soil series found in Moody County is available: e.g., Moody soil extent map (National Cooperative Soil Survey, 2011); Major Land Resource Area (MLRA) information (USDA-Natural Resources Conservation Service, 2006); Westin and Malo, 1978; Malo and Westin, 1978.

In addition to the South Dakota Agricultural Experiment Station at South Dakota State University, the local USDA Natural Resources Conservation Service (NRCS) and the South Dakota Cooperative Extension Service are other excellent sources of soils information.

Soil ratings determined by the methods described in this publication compare soils and should not change relative to each other with fluctuations in economic conditions, as they are based on the physical and chemical properties of soils. Advancements in technology also should not greatly alter the ranking of soils, because soils tend to behave similarly. The potential yield advantage of one soil over another usually does not change because a new form of fertilizer or a new plant variety has been developed.

DATA

The data used in this study includes crop and range yields, range composition, and modern detailed soil survey information from the Web Soil Survey (Soil Survey Staff, 2011a; Malo, 2008) and the published Moody County Soil Survey (Kunze, 1989). Data for each soil mapping unit and soil series was obtained from the USDA-NRCS data files and online. Current (March 2011) individual soil series information reports listing crop and range yields and range plant species composition from Web Soil Survey (Soil Survey Staff, 2011a) were used. Yields selected were for normal climatic conditions with average management.

Prior to starting this report, a determination of Forage Use Values (percentage of total forage produced that is useable to livestock) for native range plant species was completed by A. Smart (range scientist) and D. Malo (soil scientist) at South Dakota State University. Descriptive grazing and palatability information on grassland plants was also used from Internet (The PLANTS Database [http://plants.usda.gov, USDA, NRCS, 2011]; Fire Effects Information System [http://www.fs.fed.us/database/feis/ USDA, FS, 2011]) and print sources (*Grassland Plants of South Dakota and the Northern Great Plains* [Johnson and Larson, 1999]; *Plants of the Black Hills and Bear Lodge Mountains* [Larson and Johnson, 1999]). This publication's appendix table A1 contains a listing of Forage Use Values for range plants found in Moody County.

METHODS

The procedure described in this report is a revision and updating of an earlier soil productivity rating system (Malo et al., 1990; Malo and Westin, 1978). The four steps used to calculate soil productivity ratings in this procedure are as follows:

1. Determine comparative crop ratings for every soil mapping unit where data is available.
2. Determine a comparative range rating based on useable forage amounts for each soil mapping unit.
3. Calculate a balance point factor (used to equate range ratings with crop ratings).
4. Develop a soil productivity rating that reflects the highest and best use for each soil mapping unit.

YIELD and SOIL PRODUCTIVITY RATING RESULTS

The results of the procedures described above for Moody County are presented in table 1. Explanations given below assist in understanding what each column in table 1 represents and/or how it was determined. The column number is shown in parentheses (-).

MAP SYMBOL (1) – Symbols used on soil maps in the Moody County Soil Survey (Kunze, 1989; Soil Survey Staff, 2011a).

MAP UNIT NAME (2) – Name of the soil mapping unit. Information is from the Moody County Soil Survey (Kunze, 1989; Soil Survey Staff, 2011a).

PHASE INFORMATION (3) – Phase information (e.g., differences in flooding, ponding, drained, undrained, drainageways, gravel, stones, boulders, texture variations, etc.). Information is from the Moody County Soil Survey (Kunze, 1989; Soil Survey Staff, 2011a).

ACRES (4) – Acreage of each soil mapping unit. Information is from Moody County Soil Survey (Soil Survey Staff, 2011a).

PERCENT SLOPE (5) – Range in % slope used for each soil mapping unit. Information is from the Moody County Soil Survey (Kunze, 1989; Soil Survey Staff, 2011a).

PERCENT of NAMED SOIL in SOIL MAPPING UNIT (6) – Percent of named soil in the soil mapping unit. When soil mapping unit is a complex (e.g., Ethan-Egan) then both percentages are given and separated by a slash (/). Information is from Moody County Soil Survey (Kunze, 1989; Soil Survey Staff, 2011a).

PERCENT MINOR SOILS (7) – Percent of each soil mapping unit that is composed of minor or non-named soils. Information is from the Moody County Soil Survey (Kunze, 1989; Soil Survey Staff, 2011a).

LAND CAPABILITY CLASS and SUBCLASS (8) – The Land Capability classification class and subclass for each soil mapping unit. Information is from the Moody County Soil Survey (Kunze, 1989; Soil Survey Staff, 2011a).

Soils in Land Capability Classes 1, 2, 3, and 4 are normally considered suitable for cropland; soils in Land Capability Classes 5, 6, and 7 are suited for timber and range production; and soils in Land Capability Class 8 are considered to have little value for agricultural production. As the Land Capability Class numerical ranking increases, there are increasing limitations to crop, grass (range), and timber production.

The four Land Capability subclasses: e (erosion limitation [wind, water, or both]); w (wetness limitation [drainage, flooding, or ponding]); s (root zone limitation [too thin, too rocky, too sandy, too clayey, too salty, too acid, too alkaline, etc.]); and c (climate limitation [too dry, too cold, too windy, etc.]). These subclass symbols identify the limitation for crop, grass, and timber production, while the numerical class value (1–8) identifies the severity of the limitation.

YIELDS and PERCENT RANKING for EACH CROP (9–32) – Predicted soil mapping unit dryland crop yields (average management and normal climatic conditions) of the major crops grown in Moody County (Soil Survey Staff, 2011a). The soil mapping unit with the highest predicted yield for each crop was given a rating of 100%, and the other soil mapping units were given percentage ratings determined by their adapted ability when compared to the 100% soil. Individual ratings were prepared for each crop (columns 10, 12, 14, etc.). Where no yield data was available, no rating was calculated for that crop. Soil mapping units with >65% of soils in Land Capability Classes 5, 6, 7, and 8 are not suited for cropland, and thus no crop yields are given for those soil mapping units. For those soil mapping units that are a complex, the crop yields were determined based on a weighted average (percent composition) of the soils present (Soil Survey Staff, 2011a).

AVERAGE CROP RATING PERCENT (33) – Composite (average) crop rating of the soil mapping unit. The percent ratings of each crop (columns 10, 12, 14, etc.) are added together and divided by the number of crops where yield information is available. Consequently, some soil mapping units may only have two or three crop ratings to average, while others may have as many as 12. The value in this column represents the average of those crops for which a soil mapping unit has yield information available. The presence of yield information in table 1 does not always mean a soil mapping unit is well suited or adapted for that crop.

FINAL CROP RATING (34) – Final Crop Rating (FCR) for the soil mapping unit. The soil mapping unit having the highest average (composite) adapted crop percentage rating is assigned a 100% FCR and all other soils are given FCRs determined by their ability to produce crops when compared to the best soil in Moody County. For Moody County, the average percent was divided by 100%. This procedure was followed for soil mapping units with crop yield information.

WEB SOIL SURVEY CROP RATING (35) – This value is from the Web Soil Survey (Soil Survey Staff, 2011a). The highest value is 98%.

WEB SOIL SURVEY ADJUSTED CROP RATING (36) – The adjusted Web Soil Survey crop rating for each soil mapping unit. The soil mapping unit with the highest value is assigned 100%, and all other crop ratings are compared to it. For Moody County, the Web Soil Survey Crop Rating (column 35) was divided by 98%, the highest Web Soil Survey Crop Value for Moody County.

ECOLOGICAL SITE RANGELAND (37) – Ecological Site Rangeland Identification (site name and ID) of the named soils in each soil mapping unit. Information is from the Moody County Soil Survey (Soil Survey Staff, 2011a).

Range Site – NRCS ID in ()
Clayey Overflow (R102BY021SD)
Limy Subirrigated (R102BY006SD)
Loamy (R102AY010SD, R102BY010SD)
Loamy Overflow (R102AY020SD, R102BY020SD)
N/A = Not assigned an Ecological Site for range
Saline Subirrigated (102BY036SD)
Subirrigated (R102BY003SD)
Shallow Marsh (R102BY001SD)
Shallow to Gravel (R102BY014SD)
Sandy (R102BY009SD)
Thin Upland (R102BY012SD)
Very Shallow (R102BY016SD)

ECOLOGICAL SITE PASTURELAND (38) – Ecological Site Pasture Group (Group name and ID) of the named soils in each soil mapping unit. Information is from the Moody County Soil Survey (Soil Survey Staff, 2011a).

Pasture Group – NRCS ID in ()
Clayey Subsoil (G102BY210SD)
Droughty Loam (G102CY120NE)
Limy Upland (G102BY400SD, G102CY400NE)
Loam (G102AY100SD, G102BY100SD, G102CY100NE)
Not Suited/Assigned (G102BY000SD, G102CY000NE)
Overflow (G102AY500SD, G102CY500NE)
Saline (G102BY8955SD)
Silty (102BY010SD_2)
Steep Loam (G102CY109NE)
Subirrigated (G102BY700SD, G102CY700NE)
Very Droughty Loam (G102CY130NE)
Wet (G102BY900SD, G102CY900NE)

RANGE (GRASS) YIELD (39) – Predicted total annual native range yield (normal climatic conditions with average management) in pounds per acre for the soil mapping unit. For each soil mapping unit, the predicted total annual native range yield was determined based on percent composition of the soils present in each soil mapping unit. Information is from the Moody County Soil Survey (Web Soil Survey, 2011a).

FORAGE USE VALUE (40) – The Forage Use Value (FUV) was determined for each soil mapping unit based on each soil present and the individual species composition for each soil found in the soil mapping unit (Moody County Soil Survey data from Web Soil Survey, 2011a). Forage Value Ratings (FVR) for native plant species found in Moody County are presented in appendix table A1. The final FUV is a weighted average of all soils (including minor soils) in a soil mapping unit. The FVR was weighted by the species composition (% of the total) to determine the composite FUV for each soil in a soil mapping unit. The composite FUV (weighted average of all soils in a soil mapping unit) was used to determine the pounds of useable forage for each soil mapping unit.

USEABLE RANGE YIELD (41) – Estimated pounds per acre of useable forage for the soil mapping unit. Calculated by taking the Range Yield (column 39) times the FUV (column 40).

RANGE RATING (42) – The rating of each soil mapping unit if the soil mapping unit with the highest useable range yield is given the rating of 100%. In Moody County, each useable range yield (column 41) was divided by 5,232 to obtain the Range Rating.

ADJUSTED RANGE RATING (43) – The Range Rating (column 42) for each soil mapping unit was equated to the FCR using the soils with the Land Capability Class 4 classification in South Dakota. The procedure used is described below.

In practice, most soils in Land Capability Classes 1, 2, and 3 are used for cultivated crops, while soils in Classes 5, 6, and 7 are used to raise native grass and/or timber. Soils in Land Capability Class 4 have very severe limitations for cropland and are used for both cropland and for range, and therefore are useful to establish the relationship between the soils used mainly for cropland and those used mainly for range. However, the soils in Land Capability Class 4 vary; some are wet, some are steep, and some have a root zone limitation. Therefore, although all soils in Land Capability Class 4 have severe limitations for crop production, they are not all of equal productivity.

The Adjusted Range Rating (ARR) value for each soil mapping unit was determined by multiplying the Range Rating (column 42) by the Balance Point Factor (BPF) of 0.804 (Malo and Westin, 1978). The overall state-average Balance Point Factor was used to standardize calculations and to make Adjusted Range ratings comparable with Final Crop ratings.

SOIL PRODUCTIVITY RATING (44) – The Soil Productivity Rating (SPR) is the highest value of the Final Crop Rating (FCR, column 34) or the Adjusted Range Rating (ARR, column 43). Normally, the FCR value is selected as the SPR for soil mapping units in Land Capability Classes 1, 2, 3, and 4. The SPR for soil mapping units in Land Capability Classes 5, 6, 7, and 8 is normally the Adjusted Range Rating (ARR) (column 40). In those cases where the ARR is greater than the FCR, the land is best suited for range/grass production due to the limitations present. There are soils used for crop production that are best suited for grass/range.

REMARKS (45) – Additional remarks for selected soil mapping units are given in column 45. These features are to be considered on a case-by-case basis and may be used to adjust the SPR. For example, if an area has 10% water and/or trees, the SPR should be reduced by 10% or more. A recent study by the NRCS for the Chaska soil mapping unit (Kunze, personal communication, 2011) shows that percent reductions of 50% or more may be needed to more accurately reflect local conditions for that soil mapping unit. On-site inspection is recommended for those soil mapping units where remarks (see column 45 in table 1) are given. A suggestion is that for each percent a soil mapping unit is affected by the item(s) in the remarks column, the SPR should be reduced by the same percentage or more.

SUMMARY

This publication presents the methodology and current (2011) yield information and different productivity arrays of the soil mapping units in Moody County to meet various user needs. The productivity arrays presented include the following:

1. Single Crop Productivity arrays, columns 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, and 32 in table 1 (considers only crop yield information when comparing soils).
2. Final Crop Productivity Array, column 34 in table 1 (considers only crop yield information when comparing soils).
3. Adjusted Web Soil Survey Crop Productivity Array (column 36 in table 1).
4. Range Productivity Array, column 42 in table 1 (considers only range yield and species composition information when comparing soils).
5. Soil Productivity Array, column 44 in table 1 (equates the FCR and ARR arrays using a balance point factor which is based on the soils in Land Capability Class 4; this array represents the highest and best use for each soil mapping unit based on soil properties).

LITERATURE CITED

1. Johnson, J.R. and G.E. Larson. 1999. Grassland Plants of South Dakota and the Northern Great Plains. B566 (rev.). SD Agr. Exp. Sta., College of Agric and Biol Sci., South Dakota State University, Brookings.

2. Kunze, B.O. 1989. Soils Survey of Moody County, SD. USDA-SCS. Superintendent of Documents, US Government Printing Office, Washington, DC.

3. Larson, G.E. and J.R. Johnson. 1999. Plants of the Black Hills and Bear Lodge Mountains. B732. SD Agr. Exp. Sta., College of Agric and Biol Sci., South Dakota State University, Brookings.

4. Malo, D.D. 2008. Online Sources of Basic Soils Information. In Soil Science Step-by-Step Field Analysis. Ed. Logsdon, S, D. Clay, D. Moore, and T. Tsegaye. Soil Science Society of America. Madison, WI (pp. 35–48).

5. -----. 1990. Soil Productivity Ratings and Estimated Yields for Moody County, South Dakota. Plant Science Pamphlet #38. Plant Science Department. SD Agr. Exp. Sta., College of Agric and Biol Sci., South Dakota State University, Brookings.

6. Malo, D.D. and F.C. Westin. 1978. Rating South Dakota Soils According to Productivity, B657. SD Agr. Exp. Sta., College of Agric and Biol Sci., South Dakota State University, Brookings.

7. National Cooperative Soil Survey. 2011. Soil Extent Mapping Tool. Pennsylvania State University (Center for Environmental Information), West Virginia University, and USDA–Natural Resources Conservation Service (National Geospatial Development Center and National Soil Survey Center). Cooperative Ecological Studies Unit (CESU) Cooperative Agreement #68-3A75-4-104. Online at http://www.cei.psu.edu/soiltool/semtool.html?seriesname=MOODY (accessed March 2011).

8. Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. 2011a. Web Soil Survey. Online at http://websoilsurvey.nrcs.usda.gov/ (accessed March 2011).

9. -----. 2011b. Official Soil Series Descriptions. USDA-NRCE, Lincoln, NE. Online at http://soils.usda.gov/technical/classification/osd/index.html (accessed March 2011).

10. ----. 2010. Keys to Soil Taxonomy, 11th ed. USDA-Natural Resources Conservation Service, Washington, DC. Online at http://soils.usda.gov/technical/classification/tax_keys/ (accessed March 2011).

11. ----. 1999. Soil Taxonomy. Agriculture Handbook 436. USDA–Natural Resources Conservation Service. Superintendent of Documents, US Government Printing Office Washington, DC 20402. Online at http://soils.usda.gov/technical/classification/taxonomy/ (accessed March 2011).

12. USDA, FS. 2011. The Fire Effects Information System (FEIS). http://www.fs.fed.us/database/feis/ (accessed March 2011). U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, Mont.

13. USDA, NRCS. 2011. The PLANTS Database (http://plants.usda.gov, accessed March 2011). National Plant Data Center, Baton Rouge, LA.

14. ----. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Online at http://soils.usda.gov/survey/geography/mlra/index.html (accessed March 2011). The interactive MLRA Explorer online at http://www.cei.psu.edu/mlra/ (accessed March 2011).

15. Westin, F.C. and D.D. Malo. 1978, Soils of South Dakota. Bull. 656. SD Agr. Exp. Sta., College of Agric. And Biol. Sci., South Dakota State University, Brookings.

Table 1. Moody County, South Dakota, Yield Information and Soil Productivity Ratings

Plant Science Department, South Dakota State University (March 2011)
Each column is defined and described in the text (pp. 2–4). Abbreviations are defined on page 16.

								Crop Yields and Ratings					
Map Symbol	Map Unit Name	Phase	Acres	% Slope	% Named Soils	% Minor Soils	Land Capab. Subclass	Alfalfa Hay t/a*	Alf Rating %	Barley bu/a*	Barley Rtg %	Brome-grass Hay t/a*	Brome-grass Hay Rtg %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Ac	Alcester silty clay loam		1,351	0-2	90	10	1	4.5	93.8	58	93.5	3.9	100.0
Ad	Alwilda sandy loam		437	0-2	85	15	3s	2.0	41.7	31	50.0	1.8	46.2
Ar	Arlo loam	UNDRAINED	1,898	0-1	85	15	4w	0.5	10.4	19	30.6	3.0	76.9
Ba	Baltic silty clay loam	UNDRAINED	4,885	0-1	85	15	5w	na	na	na	na	na	na
Bb	Baltic silty clay loam	PONDED	3,170	0-1	90	10	8w	na	na	na	na	na	na
BeA	Blendon sandy loam		1,902	0-3	85	15	2s	3.2	66.7	47	75.8	2.8	71.8
Bo	Bon loam		3,609	0-2	85	15	1	3.2	66.7	51	82.3	3.8	97.4
Ca	Chancellor silty clay loam		3,564	0-1	85	15	2w	2.0	41.7	42	67.7	3.7	94.9
Ch	Chaska loam	CHANNELED	3,188	0-2	90	10	6w	na	na	na	na	na	na
Cm	Clamo silty clay	UNDRAINED	2,454	0-1	90	10	4w	0.5	10.4	22	35.5	2.8	71.8
DaA	Davis loam		6,183	0-2	90	10	1`	3.9	81.3	58	93.5	3.8	97.4
DaB	Davis loam		1,217	2-9	85	15	2e	4.0	83.3	55	88.7	3.4	87.2
Dc	Davison-Crossplain clay loams		4,360	0-2	60/30	10	2s/2w	2.6	54.2	42	67.7	3.5	89.7
DeA	Delmont loam		327	0-2	90	10	3s	2.1	43.8	27	43.5	1.9	48.7
DgD	Delmont-Talmo complex		691	6-40	50/30	20	6e/7s	na	na	na	na	na	na
DmA	Dempster silt loam		5,714	0-2	85	15	2s	3.1	64.6	48	77.4	2.7	69.2
DmB	Dempster silt loam		2,850	2-6	85	15	2e	2.9	60.4	45	72.6	2.6	66.7
DnB	Dempster-Talmo complex		3,015	2-9	55/25	20	2e/6s	2.5	52.1	38	61.3	2.2	56.4
Do	Dimo clay loam		1,484	0-2	85	15	2s	3.3	68.8	45	72.6	3.1	79.5
DsB	Doland loam		9,326	2-6	85	15	2e	3.6	75.0	52	83.9	3.2	82.1
DvA	Doland-Bonilla loams		4,120	0-2	60/25	15	1	4.0	83.3	57	91.9	3.4	87.2
EeB	Egan-Ethan complex		18,074	2-6	60/25	15	2e/3e	3.4	70.8	49	79.0	3.0	76.9
EnA	Enet loam		1,849	0-2	85	15	2s	3.0	62.5	41	66.1	2.6	66.7
EoA	Enet-Dimo complex		916	0-2	60/25	15	2s	3.1	64.6	42	67.7	2.8	71.8
ErD	Ethan-Clarno loams		968	6-25	50/35	15	6e/4e	na	na	na	na	na	na
EsD	Ethan-Clarno loams	VERY BOULDERY	714	6-25	50/35	15	7s	na	na	na	na	na	na
EtC	Ethan-Egan complex		6,307	5-9	45/40	15	4e/3e	3.0	62.5	41	66.1	2.6	66.7
ExC	Ethan-Egan complex	VERY STONY	1,159	2-9	50/35	15	7s/3e	na	na	na	na	na	na
FaA	Flandreau loam		1,687	0-2	85	15	2s	3.4	70.8	51	82.3	3.0	76.9
FaB	Flandreau loam		5,674	2-6	85	15	2e	3.3	68.8	48	77.4	2.9	74.4
FmB	Flandreau-Maddock complex		2,667	2-6	60/30	10	2e/3e	3.1	64.6	44	71.0	2.7	69.2

Ga	Graceville silty clay loam		4,190	0-2	85	15	1	3.7	77.1	56	90.3	3.3	84.6
GrB	Grovena loam		7,647	2-6	85	15	2e	3.8	79.2	55	88.7	3.3	84.6
GvA	Grovena-Bonilla loams		5,828	0-2	60/25	15	1	4.1	85.4	58	93.5	3.5	89.7
HoA	Houdek clay loam		976	0-2	85	15	1	3.6	75.0	53	85.5	3.2	82.1
HoB	Houdek clay loam		16,296	2-6	85	15	2e	3.4	70.8	49	79.0	3.0	76.9
HsC	Houdek-Shindler clay loams		4,415	5-9	65/20	15	3e/4e	3.0	62.5	41	66.1	2.7	69.2
HsD	Houdek-Shindler clay loams		4,898	6-25	50/35	15	4e/6e	2.5	52.1	30	48.4	2.3	59.0
HtD	Houdek-Talmo complex		1,287	6-40	50/35	15	4e/6s	1.8	37.5	21	33.9	1.6	41.0
HuA	Huntimer silty clay loam		1,085	0-3	90	10	1	3.6	75.0	55	88.7	3.2	82.1
KaB	Kranzburg silty clay loam		18,325	2-6	85	15	2e	3.7	77.1	53	85.5	3.3	84.6
KbA	Kranzburg-Brookings silty clay loams		3,022	0-2	65/25	10	1	4.1	85.4	58	93.5	3.5	89.7
La	Lamo silty clay loam		4,668	0-1	85	15	2w	1.4	29.2	37	59.7	3.9	100.0
Lb	Lamo silty clay loam	FREQ FLOODED	15,426	0-1	85	15	6w	na	na	na	na	na	na
M-W	Miscellaneous water		93	0	100	0	8w	na	na	na	na	na	na
MfC	Maddock-Flandreau complex		869	5-9	50/35	15	4e/3e	2.6	54.2	34	54.8	2.4	61.5
MnB	Moody-Nora silty clay loams		19,393	2-6	55/30	15	2e	3.6	75.0	53	85.5	3.1	79.5
MoB	Moody silty clay loam		28,276	2-4	90	10	2e	3.8	79.2	56	90.3	3.3	84.6
MtA	Moody-Trent silty clay loams		24,704	0-2	65/25	10	1	4.2	87.5	61	98.4	3.6	92.3
NcC	Nora-Crofton complex		1,033	5-9	70/20	10	3e/4e	3.3	68.8	47	75.8	3.0	76.9
NmC	Nora-Moody silty clay loams		533	5-9	45/40	15	3e	3.6	75.0	51	82.3	3.2	82.1
Og	Orthents, gravelly		372	0-60	100	0	8s	na	na	na	na	na	na
Or	Orthents, loamy		236	0-6	100	0	4e	2.6	54.2	34	54.8	2.3	59.0
Sa	Salmo silty clay loam		418	0-1	85	15	4w	0.2	4.2	11	17.7	1.5	38.5
ShE	Shindler-Houdek clay loams		2,157	15-40	45/40	15	7e/6e	na	na	na	na	na	na
Tr	Trent silty clay loam		574	0-2	85	15	1	4.8	100.0	62	100.0	3.9	100.0
W	Water		490	0	100	0	8w	na	na	na	na	na	na
Wa	Wakonda-Chancellor silty clay loams		12,016	0-2	55/35	10	2s/2w	2.7	56.3	44	71.0	3.6	92.3
WcA	Wentworth-Chancellor-Wakonda silty clay loams		12,102	0-2	55/20/15	10	1/2w/2s	3.3	68.8	52	83.9	3.5	89.7
WeB	Wentworth-Egan silty clay loams		29,409	2-6	55/30	15	2e	3.7	77.1	54	87.1	3.2	82.1
WhA	Wentworth-Trent silty clay loams		3,618	0-2	65/25	10	1	4.1	85.4	59	95.2	3.5	89.7
Wo	Worthing silty clay loam		3,221	0-1	95	5	5w	na	na	na	na	na	na
		Total Acres	333,333										

Table 1. Moody County, South Dakota, Yield Information and Soil Productivity Ratings

Plant Science Department, South Dakota State University (March 2011)
Each column is defined and described in the text (pp. 2–4). Abbreviations are defined on page 16.

Map Symbol	Map Unit Name	Crop Yields and Ratings													
		Brome-Alf AUM*	Brome-Alf Rtg %	Corn bu/a*	Corn Rtg %	Corn Silage t/a*	Corn Silage Rtg %	Grain Sorghum bu/a*	Grain Sorghum Rtg %	Oats bu/a*	Oats Rtg %	Soybean bu/a*	Soybean Rtg %	Spring Wheat bu/a*	Spring Wheat Rtg %
(1)	(2)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
Ac	Alcester silty clay loam	4.7	97.9	108	96.4	11.7	95.9	62	95.4	72	93.5	38	95.0	40	93.0
Ad	Alwilda sandy loam	2.1	43.8	37	33.0	4.0	32.8	23	35.4	36	46.8	14	35.0	21	48.8
Ar	Arlo loam	3.0	62.5	52	46.4	5.6	45.9	31	47.7	22	28.6	16	40.0	13	30.2
Ba	Baltic silty clay loam	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Bb	Baltic silty clay loam	na	na	na	na	na	na	na	na	na	na	na	na	na	na
BeA	Blendon sandy loam	3.4	70.8	74	66.1	8.1	66.4	45	69.2	55	71.4	27	67.5	31	72.1
Bo	Bon loam	4.3	89.6	99	88.4	10.7	87.7	57	87.7	63	81.8	35	87.5	35	81.4
Ca	Chancellor silty clay loam	3.7	77.1	87	77.7	9.5	77.9	52	80.0	52	67.5	32	80.0	29	67.4
Ch	Chaska loam	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Cm	Clamo silty clay	2.8	58.3	67	59.8	7.3	59.8	40	61.5	27	35.1	24	60.0	15	34.9
DaA	Davis loam	4.3	89.6	104	92.9	11.3	92.6	60	92.3	72	93.5	37	92.5	40	93.0
DaB	Davis loam	4.1	85.4	97	86.6	10.6	86.9	57	87.7	68	88.3	35	87.5	38	88.4
Dc	Davison-Crossplain clay loams	3.5	72.9	88	78.6	9.6	78.7	52	80.0	52	67.5	28	70.0	29	67.4
DeA	Delmont loam	2.2	45.8	31	27.7	3.4	27.9	20	30.8	32	41.6	12	30.0	18	41.9
DgD	Delmont-Talmo complex	na	na	na	na	na	na	na	na	na	na	na	na	na	na
DmA	Dempster silt loam	3.3	68.8	72	64.3	7.8	63.9	44	67.7	57	74.0	26	65.0	32	74.4
DmB	Dempster silt loam	3.1	64.6	63	56.3	6.8	55.7	38	58.5	53	68.8	23	57.5	31	72.1
DnB	Dempster-Talmo complex	2.6	54.2	50	44.6	5.4	44.3	31	47.7	44	57.1	18	45.0	26	60.5
Do	Dimo clay loam	3.6	75.0	84	75.0	9.2	75.4	49	75.4	53	68.8	30	75.0	30	69.8
DsB	Doland loam	3.8	79.2	92	82.1	10.0	82.0	53	81.5	65	84.4	33	82.5	36	83.7
DvA	Doland-Bonilla loams	4.1	85.4	101	90.2	11.0	90.2	59	90.8	70	90.9	36	90.0	39	90.7
EeB	Egan-Ethan complex	3.6	75.0	84	75.0	9.1	74.6	49	75.4	61	79.2	30	75.0	34	79.1
EnA	Enet loam	3.1	64.6	58	51.8	6.3	51.6	35	53.8	49	63.6	21	52.5	28	65.1
EoA	Enet-Dimo complex	3.3	68.8	66	58.9	7.2	59.0	39	60.0	50	64.9	24	60.0	28	65.1
ErD	Ethan-Clarno loams	na	na	na	na	na	na	na	na	na	na	na	na	na	na
EsD	Ethan-Clarno loams	na	na	na	na	na	na	na	na	na	na	na	na	na	na
EtC	Ethan-Egan complex	3.2	66.7	66	58.9	7.2	59.0	39	60.0	50	64.9	23	57.5	28	66.3
ExC	Ethan-Egan complex	na	na	na	na	na	na	na	na	na	na	na	na	na	na
FaA	Flandreau loam	3.6	75.0	85	75.9	9.6	78.7	51	78.5	62	80.5	31	77.5	35	81.4

FaB	Flandreau loam	3.5	72.9	80	71.4	8.7	71.3	47	72.3	59	76.6	29	72.5	33	76.7
FmB	Flandreau-Maddock complex	3.3	68.8	71	63.4	7.7	63.1	43	66.2	53	68.8	26	65.0	30	69.8
Ga	Graceville silty clay loam	3.9	81.3	97	86.6	10.6	86.9	57	87.7	69	89.6	35	87.5	39	90.7
GrB	Grovena loam	4.0	83.3	95	84.8	10.4	85.2	55	84.6	68	88.3	34	85.0	38	88.4
GvA	Grovena-Bonilla loams	4.2	87.5	104	92.9	11.3	92.6	60	92.3	72	93.5	37	92.5	40	93.0
HoA	Houdek clay loam	3.8	79.2	93	83.0	10.1	82.8	54	83.1	66	85.7	33	82.5	37	86.0
HoB	Houdek clay loam	3.6	75.0	84	75.0	9.2	75.4	49	75.4	61	79.2	30	75.0	34	79.1
HsC	Houdek-Shindler clay loams	3.2	66.7	67	59.8	7.2	59.0	39	60.0	50	64.9	23	57.5	28	65.1
HsD	Houdek-Shindler clay loams	2.7	56.3	45	40.2	4.9	40.2	26	40.0	37	48.1	15	37.5	21	48.8
HtD	Houdek-Talmo complex	1.9	39.6	30	26.8	3.3	27.0	18	27.7	25	32.5	11	27.5	14	32.6
HuA	Huntimer silty clay loam	3.8	79.2	95	84.8	10.3	84.4	55	84.6	68	88.3	34	85.0	38	88.4
KaB	Kranzburg silty clay loam	3.9	81.3	94	83.9	10.2	83.6	55	84.6	66	85.7	34	85.0	37	86.3
KbA	Kranzburg-Brookings silty clay loams	4.2	87.5	104	92.9	11.3	92.6	60	92.3	72	93.5	37	92.5	40	92.1
La	Lamo silty clay loam	3.9	81.3	78	69.6	8.5	69.7	46	70.8	45	58.4	24	60.0	26	60.5
Lb	Lamo silty clay loam	na	na	na	na	na	na	na	na	na	na	na	na	na	na
M-W	Miscellaneous water	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MfC	Maddock-Flandreau complex	2.8	58.3	49	43.8	5.3	43.4	30	46.2	40	51.9	18	45.0	23	53.5
MnB	Moody-Nora silty clay loams	3.8	79.2	98	87.5	10.6	86.9	56	86.2	66	85.7	34	85.0	37	86.0
MoB	Moody silty clay loam	4.0	83.3	101	90.2	11.0	90.2	59	90.8	70	90.9	36	90.0	39	90.7
MtA	Moody-Trent silty clay loams	4.4	91.7	110	98.2	11.9	97.5	64	98.5	76	98.7	39	97.5	42	97.7
NcC	Nora-Crofton complex	3.5	72.9	79	70.5	8.6	70.5	46	70.8	58	75.3	28	70.0	32	74.4
NmC	Nora-Moody silty clay loams	3.8	79.2	88	78.6	9.6	78.7	51	78.5	63	81.8	31	77.5	35	81.5
Og	Orthents, gravelly	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Or	Orthents, loamy	2.8	58.3	54	48.2	5.9	48.4	32	49.2	42	54.5	17	42.5	24	55.8
Sa	Salmo silty clay loam	1.5	31.3	32	28.6	3.5	28.7	20	30.8	10	13.0	9	22.5	6	14.0
ShE	Shindler-Houdek clay loams	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Tr	Trent silty clay loam	4.8	100.0	112	100.0	12.2	100.0	65	100.0	77	100.0	40	100.0	43	100.0
W	Water	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Wa	Wakonda-Chancellor silty clay loams	3.6	75.0	91	81.3	9.9	81.1	53	81.5	54	70.1	29	72.5	30	69.8
WcA	Wentworth-Chancellor-Wakonda silty clay loams	3.8	79.2	97	86.6	10.5	86.1	57	87.7	65	84.4	34	85.0	36	83.7
WeB	Wentworth-Egan silty clay loams	3.9	81.3	93	83.0	10.1	82.8	54	83.1	67	87.0	34	85.0	37	85.0
WhA	Wentworth-Trent silty clay loams	4.2	87.5	103	92.0	11.2	91.8	60	92.3	73	94.8	37	92.5	40	93.0
Wo	Worthing silty clay loam	na	na	na	na	na	na	na	na	na	na	na	na	na	na

Table 1. Moody County, South Dakota, Yield Information and Soil Productivity Ratings

Plant Science Department, South Dakota State University (March 2011)
Each column is defined and described in the text (pp. 2–4). Abbreviations are defined on page 16.

Map Symbol	Map Unit Name	Crop Yields and Ratings								Ecological Site – Rangeland Site
		Sun-flower lbs/a*	Sun-flower Rtg %	Winter wheat bu/a*	Winter Wheat Rtg %	Avg Crop Rating %	Final Crop Rtg	Web Soil Survey Crop Rtg	Adj WSS Crop Rtg	
(1)	(2)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)
Ac	Alcester silty clay loam	1540	96.3	44	93.6	95.4	95.4	94	96	LOAMY OVERFLOW (R102BY020SD)
Ad	Alwilda sandy loam	560	35.0	24	51.1	41.6	41.6	39	40	SANDY (R102BY009SD)
Ar	Arlo loam	740	46.3	8	17.0	40.2	40.2	48	49	SUBIRRIGATED (R102BY003SD)
Ba	Baltic silty clay loam	na	na	na	na	na	na	34	35	SHALLOW MARSH (R102BY001SD)
Bb	Baltic silty clay loam	na	na	na	na	na	na	9	9	No Ecological Range Site Assigned
BeA	Blendon sandy loam	1100	68.8	35	74.5	70.1	70.1	67	68	SANDY (R102BY009SD)
Bo	Bon loam	1410	88.1	39	83.0	85.1	85.1	83	85	LOAMY OVERFLOW (R102BY020SD)
Ca	Chancellor silty clay loam	1300	81.3	31	66.0	73.3	73.3	81	83	LOAMY OVERFLOW (R102BY020SD)
Ch	Chaska loam	na	na	na	na	na	na	35	36	SUBIRRIGATED (R102BY003SD)
Cm	Clamo silty clay	960	60.0	8	17.0	47.0	47.0	62	63	CLAYEY OVERFLOW (R102BY021SD)
DaA	Davis loam	1490	93.1	44	93.6	92.1	92.1	90	92	LOAMY OVERFLOW (R102BY020SD)
DaB	Davis loam	1390	86.9	41	87.2	87.0	87.0	85	87	LOAMY (R102BY010SD)
Dc	Davison-Crossplain clay loams	1250	78.1	31	66.0	72.6	72.6	80	82	LIMY SUBIRRIGATED (R102BY006SD)/LOAMY OVERFLOW (R102BY020SD)
DeA	Delmont loam	500	31.3	21	44.7	38.1	38.1	40	41	SHALLOW TO GRAVEL (R102BY014SD)
DgD	Delmont-Talmo complex	na	na	na	na	na	na	11	11	SHALLOW TO GRAVEL (R102BY014SD)/VERY SHALLOW (R102BY016SD)
DmA	Dempster silt loam	1070	66.9	36	76.6	69.4	69.4	65	66	LOAMY (R102BY010SD)
DmB	Dempster silt loam	940	58.8	34	72.3	63.7	63.7	56	57	LOAMY (R102BY010SD)
DnB	Dempster-Talmo complex	760	47.5	29	61.7	52.7	52.7	49	50	LOAMY (R102BY010SD)/VERY SHALLOW (R102BY016SD)
Do	Dimo clay loam	1220	76.3	32	68.1	73.3	73.3	72	73	LOAMY OVERFLOW (R102BY020SD)
DsB	Doland loam	1310	81.9	39	83.0	81.8	81.8	82	84	LOAMY (R102AY010SD)
DvA	Doland-Bonilla loams	1450	90.6	43	91.5	89.4	89.4	89	91	LOAMY (R102AY010SD)/LOAMY OVERFLOW (R102AY020SD)
EeB	Egan-Ethan complex	1250	78.1	37	78.7	76.4	76.4	79	81	LOAMY (R102BY010SD)/THIN UPLAND (R102BY012SD)
EnA	Enet loam	860	53.8	31	66.0	59.8	59.8	61	62	LOAMY (R102BY010SD)
EoA	Enet-Dimo complex	970	60.6	31	66.0	64.0	64.0	63	64	LOAMY (R102BY010SD)/LOAMY OVERFLOW (R102BY020SD)
ErD	Ethan-Clarno loams	na	na	na	na	na	na	33	34	THIN UPLAND (R102BY012SD)/LOAMY (R102BY010SD)
EsD	Ethan-Clarno loams	na	na	na	na	na	na	7	7	THIN UPLAND (R102BY012SD)/LOAMY (R102BY010SD)
EtC	Ethan-Egan complex	980	61.3	31	66.8	63.1	63.1	64	65	THIN UPLAND (R102BY012SD)/LOAMY (R102BY010SD)
ExC	Ethan-Egan complex	na	na	na	na	na	na	13	13	THIN UPLAND (R102BY012SD)/LOAMY (R102BY010SD)
FaA	Flandreau loam	1250	78.1	39	83.0	78.2	78.2	78	80	LOAMY (R102BY010SD)
FaB	Flandreau loam	1170	73.1	37	78.7	73.9	73.9	71	72	LOAMY (R102BY010SD)
FmB	Flandreau-Maddock complex	1060	66.3	34	72.3	67.4	67.4	60	61	LOAMY (R102BY010SD)/SANDY (R102BY009SD)

Ga	Graceville silty clay loam	1390	86.9	42	89.4	86.5	86.5	85	87	LOAMY (R102BY010SD)
GrB	Grovena loam	1360	85.0	41	87.2	85.4	85.4	84	86	LOAMY (R102BY010SD)
GvA	Grovena-Bonilla loams	1480	92.5	44	93.6	91.6	91.6	90	92	LOAMY (R102BY010SD)/LOAMY OVERFLOW (R102BY020SD)
HoA	Houdek clay loam	1330	83.1	40	85.1	82.8	82.8	87	89	LOAMY (R102BY010SD)
HoB	Houdek clay loam	1200	75.0	37	78.7	76.2	76.2	82	84	LOAMY (R102BY010SD)
HsC	Houdek-Shindler clay loams	950	59.4	31	66.0	63.0	63.0	63	64	LOAMY (R102BY010SD)/LOAMY (R102BY010SD)
HsD	Houdek-Shindler clay loams	640	40.0	23	48.9	46.6	46.6	41	42	LOAMY (R102BY010SD)/LOAMY (R102BY010SD)
HtD	Houdek-Talmo complex	440	27.5	16	34.0	32.3	32.3	31	32	LOAMY (R102BY010SD)/VERY SHALLOW (R102BY016SD)
HuA	Huntimer silty clay loam	1410	88.1	41	87.2	84.7	84.7	89	91	LOAMY (R102BY010SD)
KaB	Kranzburg silty clay loam	1340	83.8	40	85.1	83.9	83.9	87	89	LOAMY (R102AY010SD)
KbA	Kranzburg-Brookings silty clay loams	1490	93.1	44	93.6	91.6	91.6	93	95	LOAMY (R102AY010SD)/LOAMY OVERFLOW (R102AY020SD)
La	Lamo silty clay loam	1120	70.0	27	57.4	65.5	65.5	67	68	SUBIRRIGATED (R102BY003SD)
Lb	Lamo silty clay loam	na	na	na	na	na	na	34	35	SUBIRRIGATED (R102BY003SD)
M-W	Miscellaneous water	na	na	na	na	na	na	na	na	No Ecological Range Site Assigned
MfC	Maddock-Flandreau complex	750	46.9	26	55.3	51.2	51.2	43	44	SANDY (R102BY009SD)/LOAMY (R102BY010SD)
MnB	Moody-Nora silty clay loams	1380	86.3	41	87.2	84.2	84.2	87	89	LOAMY (R102BY010SD)/LOAMY (R102BY010SD)
MoB	Moody silty clay loam	1440	90.0	43	91.5	88.5	88.5	88	90	LOAMY (R102BY010SD)
MtA	Moody-Trent silty clay loams	1570	98.1	46	97.9	96.2	96.2	94	96	LOAMY (R102BY010SD)/LOAMY OVERFLOW (R102BY020SD)
NcC	Nora-Crofton complex	1130	70.6	35	74.5	72.6	72.6	70	71	LOAMY (R102BY010SD)/THIN UPLAND (R102BY012SD)
NmC	Nora-Moody silty clay loams	1250	78.1	39	83.0	79.7	79.7	76	78	LOAMY (R102BY010SD)/LOAMY (R102BY010SD)
Og	Orthents, gravelly	na	na	na	na	na	na	na	na	No Ecological Range Site Assigned
Or	Orthents, loamy	770	48.1	26	55.3	52.4	52.4	1	1	No Ecological Range Site Assigned
Sa	Salmo silty clay loam	370	23.1	4	8.5	21.7	21.7	32	33	SALINE SUBIRRIGATED (R102BY036SD)
ShE	Shindler-Houdek clay loams	na	na	na	na	na	na	21	21	LOAMY (R102BY010SD)/LOAMY (R102BY010SD)
Tr	Trent silty clay loam	1600	100.0	47	100.0	100.0	100.0	98	100	LOAMY OVERFLOW (R102BY020SD)
W	Water	na	na	na	na	na	na	na	na	No Ecological Range Site Assigned
Wa	Wakonda-Chancellor silty clay loams	1300	81.3	32	68.1	75.0	75.0	82	84	LIMY SUBIRRIGATED (R102BY006SD)/LOAMY OVERFLOW (R102BY020SD)
WcA	Wentworth-Chancellor-Wakonda silty clay loams	1440	90.0	39	83.0	84.0	84.0	83	85	LOAMY (R102BY010SD)/LOAMY OVERFLOW (R102BY020SD)/LIMY SUBIRRIGATED (R102BY006SD)
WeB	Wentworth-Egan silty clay loams	1380	86.3	40	86.0	83.8	83.8	86	88	LOAMY (R102BY010SD)/LOAMY (R102BY010SD)
WhA	Wentworth-Trent silty clay loams	1530	95.6	44	93.6	92.0	92.0	93	95	LOAMY (R102BY010SD)/LOAMY OVERFLOW (R102BY020SD)
Wo	Worthing silty clay loam	na	na	na	na	na	na	32	33	SHALLOW MARSH (R102BY001SD)

Table 1. Moody County, South Dakota, Yield Information and Soil Productivity Ratings

Plant Science Department, South Dakota State University (March 2011)
Each column is defined and described in the text (pp. 2–4). Abbreviations are defined on page 16.

Map Symbol	Map Unit Name	Ecological Site – Pasture Group	Crop Yields and Ratings						SPR Adjustment Remarks
			Range Yield lbs/a*	Forage Use Value+	Use Rge Yield lbs/a*	Range Rtg++	Adj Range Rating#	Soil Prod Rtg	
(1)	(2)	(38)	(39)	(40)	(41)	(42)	(43)	(44)	(45)
Ac	Alcester silty clay loam	Overflow (G102CY500NE)	4560	0.826	3767	72.0	57.9	95.4	
Ad	Alwilda sandy loam	Very Droughty Loam (G102CY130NE)	3340	0.803	2683	51.3	41.2	41.6	
Ar	Arlo loam	Wet (G102CY900NE)	5105	0.882	4505	86.1	69.2	69.2	TREES/WATER
Ba	Baltic silty clay loam	Wet (G102BY900SD)	6257	0.559	3498	66.9	53.8	53.8	TREES/WATER
Bb	Baltic silty clay loam	Not suited (G102BY000SD)	1040	0.313	326	6.2	5.0	5.0	TREES/WATER
BeA	Blendon sandy loam	Droughty Loam (G102CY120NE)	3612	0.797	2880	55.1	44.3	70.1	
Bo	Bon loam	Overflow (G102CY500NE)	4810	0.837	4027	77.0	61.9	85.1	
Ca	Chancellor silty clay loam	Subirrigated (G102BY700SD)	4962	0.825	4096	78.3	62.9	73.3	
Ch	Chaska loam	Subirrigated (G102CY700NE)	4986	0.904	4508	86.2	69.3	69.3	TREES/WATER/CHANNELING/FENCES DIFFICULT TO MAINTAIN
Cm	Clamo silty clay	Wet (G102CY900NE)	4272	0.791	3379	64.6	51.9	51.9	TREES/WATER
DaA	Davis loam	Overflow (G102CY500NE)	4548	0.823	3744	71.6	57.5	92.1	SANDY
DaB	Davis loam	Loam (G102CY100NE)	3770	0.820	3093	59.1	47.5	87.0	
Dc	Davison-Crossplain clay loams	Subirrigated (G102CY700NE)/ Subirrigated (G102CY700NE)	4562	0.827	3774	72.1	58.0	72.6	
DeA	Delmont loam	Very Droughty Loam (G102CY130NE)	2800	0.766	2145	41.0	33.0	38.1	
DgD	Delmont-Talmo complex	Very Droughty Loam (G102CY130NE)/ Not Suited (G102CY000NE)	2567	0.766	1966	37.6	30.2	30.2	
DmA	Dempster silt loam	Droughty Loam (G102CY120NE)	3489	0.820	2861	54.7	44.0	69.4	
DmB	Dempster silt loam	Droughty Loam (G102CY120NE)	3248	0.818	2656	50.8	40.8	63.7	
DnB	Dempster-Talmo complex	Droughty Loam (G102CY120NE)/ Not suited (G102CY000NE)	3168	0.800	2533	48.4	38.9	52.7	
Do	Dimo clay loam	Subirrigated (G102CY700NE)	4576	0.835	3823	73.1	58.7	73.3	
DsB	Doland loam	Loam (G102AY100SD)	3619	0.824	2981	57.0	45.8	81.8	
DvA	Doland-Bonilla loams	Loam (G102AY100SD)/ Overflow (G102AY500SD)	3889	0.825	3210	61.4	49.3	89.4	
EeB	Egan-Ethan complex	Silty (102BY010SD_2), Loam (G102BY100SD)/ Limy Upland (G102BY400SD)	3778	0.814	3075	58.8	47.3	76.4	
EnA	Enet loam	Droughty Loam (G102CY120NE)	3372	0.824	2778	53.1	42.7	59.8	
EoA	Enet-Dimo complex	Droughty Loam (G102CY120NE)/ Subirrigated (G102CY700NE)	3772	0.832	3137	60.0	48.2	64.0	
ErD	Ethan-Clarno loams	Limy Upland (G102BY400SD)/ Loam (G102BY100SD), Silty (102BY010SD_2)	3069	0.814	2498	47.7	38.4	38.4	
EsD	Ethan-Clarno loams	Not suited (G102BY000SD)/ Silty (102BY010SD_2)	2701	0.810	2188	41.8	33.6	33.6	STONES
EtC	Ethan-Egan complex	Limy Upland (G102BY400SD)/ Silty (102BY010SD_2), Loam (G102BY100SD)	3555	0.814	2894	55.3	44.5	63.1	
ExC	Ethan-Egan complex	Not suited (G102BY000SD)/ SILTY (102BY010SD_2)	3215	0.813	2614	50.0	40.2	40.2	STONES
FaA	Flandreau loam	Loam (G102CY100NE)	3588	0.823	2952	56.4	45.4	78.2	

FaB	Flandreau loam	Loam (G102CY100NE)	3355	0.822	2758	52.7	42.4	73.9	
FmB	Flandreau-Maddock complex	Loam (G102CY100NE)/ Very Droughty Loam (G102CY130NE)	3481	0.815	2835	54.2	43.6	67.4	
Ga	Graceville silty clay loam	Loam (G102CY100NE)	3755	0.823	3090	59.1	47.5	86.5	
GrB	Grovena loam	Loam (G102CY100NE)	3838	0.824	3161	60.4	48.6	85.4	
GvA	Grovena-Bonilla loams	Loam (G102CY100NE)/ Overflow (G102CY500NE)	4014	0.824	3309	63.2	50.9	91.6	
HoA	Houdek clay loam	Loam (G102CY100NE)	3702	0.824	3049	58.3	46.9	82.8	
HoB	Houdek clay loam	Loam (G102CY100NE)	3569	0.824	2939	56.2	45.2	76.2	
HsC	Houdek-Shindler clay loams	Loam (G102CY100NE)/ Limy Upland (G102CY400NE)	3592	0.826	2967	56.7	45.6	63.0	
HsD	Houdek-Shindler clay loams	Loam (G102CY100NE)/ Steep Loam (G102CY109NE)	3215	0.824	2649	50.6	40.7	46.6	
HtD	Houdek-Talmo complex	Loam (G102CY100NE)/ Not suited (G102CY000NE)	3025	0.787	2381	45.5	36.6	36.6	
HuA	Huntimer silty clay loam	Silty (102BY010SD_2), Clayey Subsoil (G102BY210SD)	3870	0.823	3187	60.9	49.0	84.7	
KaB	Kranzburg silty clay loam	Loam (G102AY100SD)	3626	0.824	2987	57.1	45.9	83.9	
KbA	Kranzburg-Brookings silty clay loams	Loam (G102AY100SD)/ Overflow (G102AY500SD)	3826	0.825	3158	60.4	48.5	91.6	
La	Lamo silty clay loam	Subirrigated (G102CY700NE)	5861	0.893	5232	100.0	80.4	80.4	TREES/WATER
Lb	Lamo silty clay loam	Subirrigated (G102CY700NE)	5868	0.782	4589	87.7	70.5	70.5	TREES/WATER/CHANNELING/FENCES DIFFICULT TO MAINTAIN
M-W	Miscellaneous water	No Ecological Pasture Group Assigned	ns/na	ns/na	ns/na	ns/na	ns/na	ns/na	
MfC	Maddock-Flandreau complex	Very Droughty Loam (G102CY130NE)/ Loam (G102CY100NE)	3481	0.809	2816	53.8	43.3	51.2	SANDY
MnB	Moody-Nora silty clay loams	Loam (G102CY100NE)/ Loam (G102CY100NE)	3750	0.824	3090	59.1	47.5	84.2	
MoB	Moody silty clay loam	Loam (G102CY100NE)	3816	0.824	3143	60.1	48.3	88.5	
MtA	Moody-Trent silty clay loams	Loam (G102CY100NE)/ Overflow (G102CY500NE)	4110	0.825	3392	64.8	52.1	96.2	
NcC	Nora-Crofton complex	Loam (G102CY100NE)/ Limy Upland (G102CY400NE)	3532	0.821	2900	55.4	44.6	72.6	
NmC	Nora-Moody silty clay loams	Loam (G102CY100NE)/ Loam (G102CY100NE)	3736	0.823	3075	58.8	47.2	79.7	
Og	Orthents, gravelly	Not suited (G102CY000NE)	1200	0.729	875	16.7	13.4	13.4	SHALLOW
Or	Orthents, loamy	Not suited (G102CY000NE)	2900	0.810	2349	44.9	36.1	52.4	SHALLOW
Sa	Salmo silty clay loam	Saline (G102BY895SD)	4680	0.830	3885	74.2	59.7	59.7	
ShE	Shindler-Houdek clay loams	Not suited (G102CY000NE)/ Steep Loam (G102CY109NE)	3293	0.824	2714	51.9	41.7	41.7	
Tr	Trent silty clay loam	Overflow (G102CY500NE)	4722	0.830	3919	74.9	60.2	100.0	
W	Water	No Ecological Pasture Group Assigned	ns/na	ns/na	ns/na	ns/na	ns/na	ns/na	
Wa	Wakonda-Chancellor silty clay loams	Subirrigated (G102CY700NE)/ Subirrigated (G102CY700NE)	4408	0.828	3650	69.8	56.1	75.0	
WcA	Wentworth-Chancellor-Wakonda silty clay loams	Loam (G102BY100SD), Silty (102BY010SD_2)/ Subirrigated (G102BY700SD)/ Subirrigated (G102BY700SD)	4480	0.793	3553	67.9	54.6	84.0	
WeB	Wentworth-Egan silty clay loams	Silty (102BY010SD_2), Loam (G102BY100SD)/ SILTY (102BY010SD_2), Loam (G102BY100SD)	3920	0.820	3214	61.4	49.4	83.8	
WhA	Wentworth-Trent silty clay loams	Silty (102BY010SD_2), Loam (G102BY100SD)/ Overflow (G102BY500SD)	4166	0.819	3412	65.2	52.4	92.0	
Wo	Worthing silty clay loam	Not suited (G102BY000SD)	6688	0.521	3484	66.6	53.5	53.5	TREES/WATER

ABBREVIATIONS USED in TABLE 1

Abbreviation – Meaning
Adj – adjusted
AUM – animal unit month
Avg – average
bu/a – bushels/acre
Capab – capability
lb/a – pounds/acre
Pct (%) – percent
Prod – productivity
Rtg – rating
t/a – tons/acre
SPR – Soil Productivity Rating
WSS – Web Soil Survey
Yld – yield

Crop/Range:
ns/na – soil not suited or not adapted

Ecological Sites:
NE – Nebraska
SD – South Dakota

* Yields are based on the best information available at the time of publication. Yields are for average management and climatic conditions. The yields in this publication may differ from those given on Web Soil Survey or found in the published soil survey report for Moody County.

\+ Forage Use Value – used to convert total range production into useable pounds.

++ A simple array, not adjusted. The best range producing soil has a rating of 100%.

Adjusted Range Rating = Range Rating × Balance Point Factor. The Balance Point Factor used = 0.804 (based on Class 4 soils mapped in South Dakota).

APPENDIX

Table A1. Forage Value Rating (FVR[1]) for South Dakota Range Plants

Common Name or Species	NRCS Plant Symbol*	Species*	FVR**
Alkali Bluegrass (Sandberg Bluegrass)	POJU	*Poa juncifolia*	7
Alkali Cordgrass	SPGR	*Spartina gracilis*	4
Alkaligrass (Nuttail)	PUCCI	*Puccinellia nuttalliana*	3
Alkali Sacaton	SPAI	*Sporobolus airoides*	6
American Licorice	GLLE3	*Glycyrrhiza lepidota*	3
American Mannagrass	GLGR	*Glyceria grandis*	3
American Pasqueflower	PUPA5	*Pulsatilla patens*	1
American Water Plantain	ALSU	*Alisma subcordatum*	3
Annual Bluegrass	POAN	*Poa annua*	7
Aster	SYMPH4	*Asteraceae sp*	2
Big Bluestem	ANGE	*Andropogon gerardii*	10
Black Samson	ECAN2	*Blacksamson echinacea*	9
Blue Grama	BOGR2	*Bouteloua gracilis*	9
Breadroot Scurfpea	PSORA	*Psoralidium sp.*	2
Canada Wildrye	ELCA4	*Elymus canadensis*	7
Chairmaker's Bulrush	SCAM6	*Schoenoplectus americanus*	2
Common Rivergrass	SCOLO	*Scolochloa festucacea*	8
Common Spikerush	ELPA3	*Eleocharis palustris*	2
Curlytop Knotweed	POLA4	*Polygonum lapathifolium*	2
Dotted Gayfeather (Dotted Blazing Star)	LIPU	*Liatris punctata*	9
Dropseed (Prairie)	SPHE	*Sporobolus heterolepis*	6
False Boneset	BREUC	*Brickellia eupatorioides*	6
Fendler's Threeawn	ARFE4	*Aristida purpurea*	2
Flat-top Goldentop	EUGR5	*Euthamia graminifolia*	1
Fringed Sagewort	ARFR4	*Artemisia frigida*	5
Green Needlegrass	STVI4	*Nassella viridula*	7
Hairy Grama	BOHI2	*Bouteloua hirsuta*	8
Heath Aster	ASER3	*Symphyotrichum ericoides*	2
Hesperostipa spartea (Porcupinegrass)	HESP11	*Hesperostipa spartea*	5
Indiangrass	SONU2	*Sorghastrum nutans*	10
Kentucky Bluegrass	POPR	*Poa pratensis*	9
Little Bluestem	SCSC	*Schizachyrium scoparium*	9
Leadplant	AMCA6	*Amorpha canescens*	4
Louisiana Sagewort (White Sagebrush)	ARLU	*Artemisia ludoviciana*	4
Maximilian Sunflower	HEMA2	*Helianthus maximiliani*	6
Missouri Goldenrod	SOMI2	*Solidago missouriensis*	2
Needle and thread	HECOC8	*Hesperostipa comata*	8
Plains Cottonwood	POSA8	*Populus deltoides*	2
Plains Muhly	MUCU3	*Muhlenbergia cuspidata*	5
Plains Pricklypear	OPUNT	*Opuntia sp.*	0
Prairie Cordgrass	SPPE	*Spartina pectinata*	5
Prairie Dropseed	SPHE	*Sporobolus heterolepis*	6

Table A1. Forage Value Rating (FVR[1]) for South Dakota Range Plants

Common Name or Species	NRCS Plant Symbol*	Species*	FVR**
Prairie Junegrass	KOMA	*Koeleria macrantha*	9
Prairie Sagewort	ARFR4	*Artemisia frigida*	5
Prairie Sandreed	CALO	*Calamovilfa longifolia*	7
Purple Coneflower	ECAN2	*Blacksamson echinacea*	9
Rose	ROSA5	*Rosa sp.*	4
Sand Bluestem	ANHA	*Andropogon hallii*	9
Sedge	CAREX	*Carex sp.*	6
Sideoats Grama	BOCU	*Bouteloua curtipendula*	9
Silver Buffaloberry	SHAR	*Shepherdia argentea*	1
Silverleaf Scurfpea	PSAR2	*Pediomelum argophyllum*	2
Slender Wheatgrass	ELTRT	*Agropyrn subsecundum*	9
Slimflower Scurfpea	PSTE5	*Psoralidium tenuiflorum*	2
Slough Sedge	CAOB3	*Carex obnupta*	3
Stiff Goldenrod	OLRIR	*Oligoneuron rigidum*	3
Stiff Sunflower	HEPAP2	*Helianthus pauciflorus*	8
Switchgrass	PAVI2	*Panicum virgatum*	9
Violet Prairie Clover	DAPU5	*Dalea purpurea*	10
Western Snowberry	SYOC	*Symphoricarpos occidentalis*	2
Western Wheatgrass	PASM	*Pascopyrum smithii*	8
Western Yarrow	ACMIO	*Achillea millefolium*	2
Wormwood	ARAB3	*Artemisia absinthium*	1
Yellow Indiangrass	SONU2	*Sorghastrum nutans*	10

[1] Assumed year-round cattle grazing (excellent palatability = 9-10, good = 6-8, fair = 3-5, poor = 1-2, no palatability = 0)

* Source – USDA Plant Database, 2011 (http://plants.usda.gov/).

** Sources for Forage Palatability information:

– USDA, NRCS. 2011. The PLANTS Database (http://plants.usda.gov).

– Johnson, J.R. and G.E. Larson. 1999. Grassland Plants of South Dakota and the Northern Great Plains. B566.

– Larson, G.E. and J.R. Johnson. 1999. Plants of the Black Hills and Bear Lodge Mountains. B732.

– USDA, FS. 2011. The Fire Effects Information System (FEIS) (http://www.fs.fed.us/database/feis/).