AGR-276

Kentucky Land Capability Classes and Limitations

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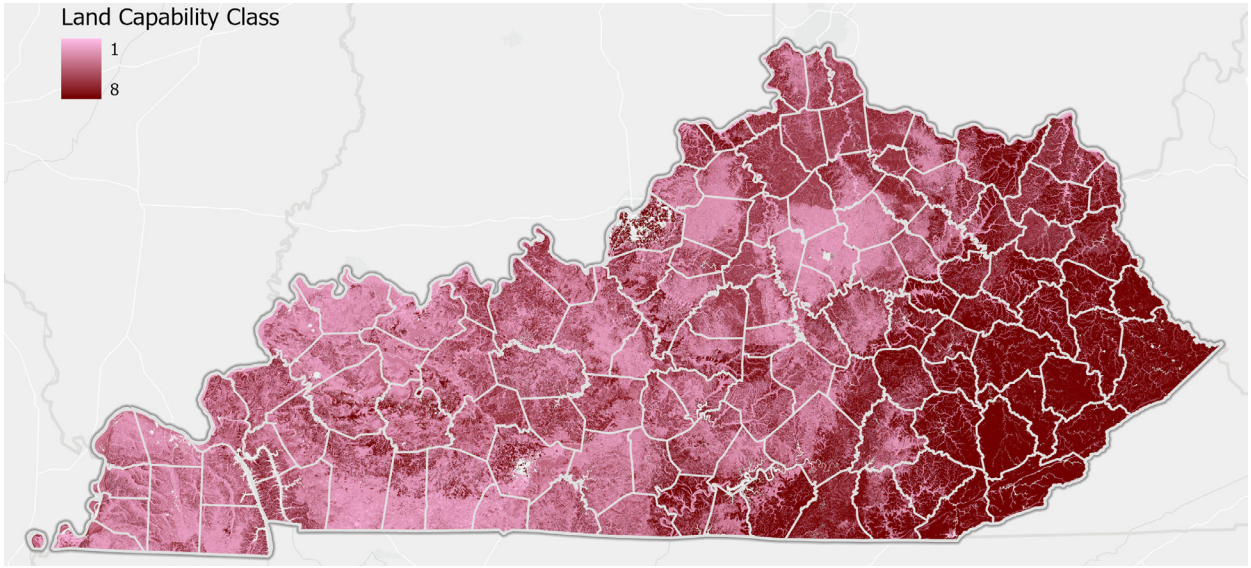

Figure 1. Land capability classes across Kentucky (USDA NRCS). Lighter red colors represent land with fewer limitations for agricultural production.

The USDA NRCS has established a national land classification system (Figure 1) to help landowners and farm operators with land use planning. This system classifies land for agricultural purposes by the intensity with which it can be used for crop production and by the nature of the limiting problem. In general, the better the Land Class (lower numeric values), the less management is necessary to produce a crop while protecting the soil resource and the environment. For example, Class I land has no limitations for agricultural use, while Class VII land is severely limited. Land Class I-IV can produce cultivated crops with good conservation management. Land Classes V through VII are best suited to perennial species but can be used to produce some specialized crops with highly intensive management. Class VIII soils are not suitable for managed vegetative production.

Kentucky can be divided into seven major soil physiographic regions within Kentucky (Figure 2). The majority of row crop agriculture within the state can be found in the western physiographic regions of the Mississippi Embayment, Western Coalfields, and Western Pennyrile. In general, these areas have broader plains, rolling terrain and deeper soils than Kentucky's eastern physiographic regions. The Bluegrass is characterized by relatively shallower soils over limestone. The Knobs region is the highly eroded and dissected limestone parent material of the Bluegrass region. The Eastern Pennyrile is more eroded with steeper slopes than the broader plains of the Western Pennyrile. The Eastern Coalfields are mountainous with steep slopes with few level areas for row crop production. When you compare the soil physiographic region map (Figure 2) with the Land Capability Class map (Figure 1), it is apparent that the better land use classes (Class I-IV) are found in the western part of the Commonwealth.

Table 1. NRCS Land Capability Classification for Kentucky Land Area (USDA NRCS).

Class	Definition	% of Kentucky Land Area
I	Slight soil limitations that restrict their use.	0.5
II	Moderate soil limitations that reduce the choice of plants or require moderate conservation practices.	22.2
III	Severe limitations that reduce the choice of plants or require special conservation practices, or both.	16.2
IV	Very severe limitations that restrict the choice of plants or require very careful management, or both.	11.3
V	Little or no hazard of erosion but have other limitations, impractical to remove (flooding, stoniness, etc.), that limit their use mainly to pasture, range, forestland, or wildlife habit.	0.2
VI	Severe limitations that make them generally unsuited to cultivation and that limit their use mainly to pasture, range, forestland, or habitat.	16.1
VII	Very severe limitations that make them unsuited to cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.	30.0
VIII	Soils and miscellaneous areas have limitations that preclude their use for commercial plant production and limit their use to recreation, wildlife habitat, water supply or esthetic purposes.	0.7

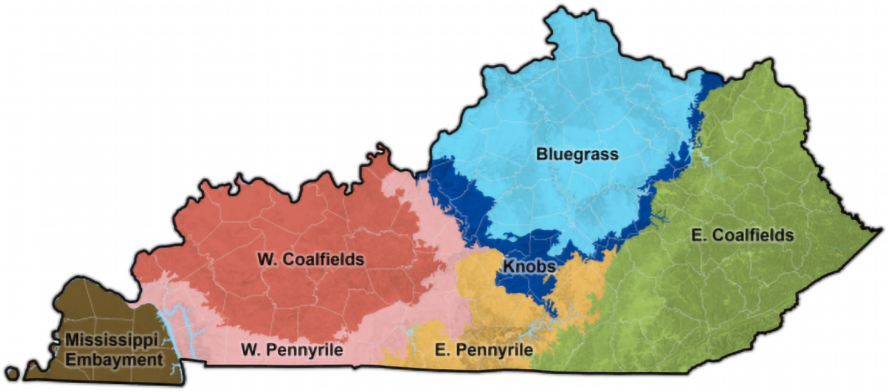

Figure 2. Physiographic provinces across Kentucky (USDA NRCS).

Table 2. Percent Land Class within each Kentucky Physiographic Province.[1]

Physiographic Province	I & II	III	IV	VI	VII & VIII
Mississippi Embayment	47	19	19	10	5
Western Coalfields	38	20	16	17	9
Western Pennyrile	33	26	15	16	10
Eastern Pennyrile	18	25	14	16	27
Knobs	24	23	11	18	24
Bluegrass	24	22	14	28	12
Eastern Coalfields	5	5	5	10	75

[1]Area within each province calculated based on majority of county area. This means that border counties are considered to be 100% within the physiographic province that occupies over half of the county.

Land Subclass

The USDA NRCS goes further to describe limitations associated with Land Class II-VII. Subclass "e" refers to limitations associated with land susceptibility to erosion. Subclass "s" is made up of soils that have soil limitations within the rooting zone due to shallow soils, low moisture-holding capacity, low fertility, or salinity/sodium content. Subclass "w" refers to soil limitations associated with excess water, such as poor soil drainage or a high water-table.

Within Kentucky, the major limitation for approximately 77% of Kentucky soils is erosion. This limitation can be found across all physiographic provinces from the rolling topography of the Mississippi Embayment to the steep slopes of the mountainous Eastern Coalfields.

Of the land capable of growing crops in Kentucky with limitations, Class II-IV, the primary limitation to be addressed is erosion (Table 2). There are several Best Management Practices (BMPs) available, subsidized by the USDA NRCS, and designed to mitigate this limitation (i.e. grass waterways, contour cultivation, cover crops, no-tillage, strip tillage). These BMPs may require significant changes in management practices which may or may not be compatible for the current agronomic production system, land use, or operator management style. It is important to evaluate each BMP carefully to choose which is most suitable for each farm field. It is imperative that soil erosion be addressed to maintain the sustainability of farms in the future. If left unchecked soil erosion rapidly degrades the quality of the soil resource leading to losses in productivity. Contact your local county Cooperative Extension Service office or USDA NRCS office to determine if funding is available to implement BMPs in your area and which BMP might be most suitable for your farming operation. Additional information on Kentucky land potentials may be found in AGR-215: *Evaluating Land Resource Potentials in Kentucky.*

Table 3. Subclasses of soils across Kentucky. [1]

Land Class	Subclass "e"		Subclass "s"		Subclass "w"	
	Acres	% total acres	Acres	% total acres	Acres	% total acres
II	3556283	13.8	62333	0.2	2123849	8.2
III	3350436	13.0	35487	0.1	803784	3.1
IV	2719956	10.5	68346	0.3	134880	0.5
V	0	0.0	0	0.0	54305	0.2
VI	3515055	13.6	674331	2.6	0	0.0
VII	6713873	26.0	1146237	4.4	2189	>0.0

[1]There are no limitations for Land Class I.

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