

LAND VALUATION

**LAND VALUATION
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AGRICULTURAL LAND VALUATION

INTRODUCTION

Iowa law provides that in assessing land classified as agricultural realty, (see classification information in Iowa Administrative Rules 701.71.1(3)), the actual value shall be determined on the basis of productivity and net earning capacity of the property determined on the basis of its use for agricultural purposes capitalized at a seven percent rate (7%) as defined in Iowa Code 441.21(1)e. This value shall be applied uniformly among all counties and any formula or method employed to determine productivity and net earning capacity shall be adopted in full by rule. In Iowa Code 441.21(1)f, the law further provides that in counties in which a modern soil survey (1949 and later) has been completed, the assessor shall place emphasis upon the results of the survey in spreading the valuation among individual parcels of agricultural property. The assessor shall use the most current corn suitability rating soil survey as required by code. The assessor shall adjust non-cropland as stated in Iowa Administrative Rule 701-71.3(1)b in the distribution of the productivity valuation to each parcel.

The provisions of Iowa law mentioned above clearly indicate that assessors must be prepared to undertake studies of income and expenses in compliance with the productivity formula in order to properly assess agricultural properties. They must also create a system to identify land use between cropland and non-cropland. After determining the productivity valuation from income, expense and production studies, the assessor applies the results to individual parcels in a uniform process to determine the productivity value of each parcel.

The state equalization process sets the total agricultural value within each assessing jurisdiction. The assessor is charged with equitably distributing the value to each parcel. This section will detail the steps and processes of developing a system for the distribution of the valuation based on the corn suitability ratings for each parcel. The process can be performed on one agricultural parcel or on all agricultural parcels within an assessment jurisdiction.

SOIL MAPS

Agricultural land values differ primarily because of the variation in (a) productivity of the soil, (b) use for buildings, (c) location, and (d) other factors. The goal of the soil scientist in making a soil map is to identify the soils and to record their location on a map. Since each type of soil has a unique use, management, and production capabilities, it follows that the soil map, together with the accompanying interpretations, is a valuable tool in an equitable distribution of the valuation agricultural land as well as provides compliance with 441.21 (1)e and (1)f.

Soil maps are constructed using an aerial photograph as a base map. Soil surveys are made by careful examination of the soil in the field, and delineation of soil mapping units on the aerial base photo. Soil mapping units are presently identified by a three-part symbol. For example 120c2, the 120 portion of the symbol indicates the soil type, Tama silty clay loam, the C indicates the slope group, and the 2 indicates the erosion phase (thickness of "A" horizon or topsoil). Mapping units that have 0 to 2 percent slope and slight or no erosion are group A, erosion phase 1, would be identified only as 120.

Following is a list of symbols used to identify slope and erosion in Iowa

SLOPE

No symbol	0 to 2 and 1 to 3 percent	Level and Nearly Level
B	2 to 5 percent	Gently Sloping
C	5 to 9 percent	Moderately Sloping
D	9 to 14 percent	Strongly Sloping
E	14 to 18 percent	Moderately Steep
F	18 to 25 percent	Steep
G	25 to 40 percent	Very Steep

EROSION

No symbol	None to slight erosion; no evident exposed subsoil when plowed; more than 7 inches of "A" horizon
2	Moderately eroded; usually 3 to 7 inches of total "A" horizon with some mixing of subsoil.
3	Severely eroded; when plowed the "Ap" horizon is predominantly subsoil with less than 3 inches of total "A" horizon remaining.
+	Overwash.

AGRICULTURAL LAND VALUATION (Continued)

SOIL MAPS (Continued)

Slope and erosion phases may have different designations than those given above. Interpretation of a soil map should be made using the soil mapping legend in effect for the time and the area for which the soil map was made. The same statement applies to the soil type number.

The areas mapped in a soil survey are keyed to a classification system. The areas within defined limits have similar physical, chemical, and biological properties as determined by a field and laboratory tests. This procedure makes it possible to predict the behavior of the areas mapped, based on past experience with similar soils under various land uses.

SOIL RATINGS

The CSR (corn suitability rating) is a soil productivity rating for Iowa soils that ranges from a low of 5 to a high of 100. It was introduced in 1971 by Thomas Fenton from Iowa State University. The index has been correlated to crop yields although part of the intent of the index was to establish a system for equitable tax assessment.

The formula for CSR2 is $CSR2=S-M-W-F-D+-EJ$ is more transparent in how Iowa soils are rated as compared to the original CSR ratings. The calculation can be made using publicly available data. The letters in the formula are:

S – is the taxonomic subgroup class of the series of the soil map unit.

M – is the family particle size class.

W – relates to available water holding capacity of the series.

F – is the field condition of a particular MU, for example, slope, flooding, ponding, erosion class, and topsoil thickness.

D – is the soil depth and tolerable rate of soil erosion.

EJ – is an expert judgment correction factor. EJ is normally used with parent materials that have very high bulk density and/or unusually clayey or sandy.

Additional information in regard to CSR2 is available at the Iowa State University Agronomy Department and on their website. The 4-page description of CSR2 is posted on the Soil and Land Use website.

Additional postings include an article about CSR2 in the ICM Newsletter. ISU does not anticipate changes to the description in the near future. However, ISU will review annually and update if required. Therefore assessors may need to ascertain if updated information is available at the time of reading.

The assessor should use the most modern soil survey and the most current corn suitability ratings for their jurisdiction. These figures are available from the USDA Natural Resource Conservation Service web site.

LAND USE ADJUSTMENT

Iowa Administrative Rule 701-71.3(1)b requires the assessor to distribute the productivity valuation, as defined in Rule 701-71.3(a), and shall adjust non-cropland as defined in this rule. The adjustment shall be applied to non-cropland with a corn suitability rating that is greater than 50 percent of the average corn suitability rating for cropland for the county. The adjustment shall be determined for each county based on the five year average difference in cash rent between non-irrigated cropland and pasture land as published by NASS. In extreme or unusual cases, other adjustments may be necessary on a per parcel basis.

DEFINING LAND USE

Before the assessor can apply the adjustment to the land designated as non-crop delineation of cropland and non-cropland is required. Below is a list of items to assist the assessor in determining the land use differentiation between cropland and non-cropland.

CROPLAND

1. Land that at some time has been in production and is capable of crop production.
2. Land currently enrolled in an active conservation reserve program receiving payments for land that was once in crop production.
3. Land that consists of manmade grass waterways or crossable waterways and is capable of crop production.
4. Land that consists of manmade terraces, buffer strips, or similar manmade objects.
5. Tillable pasture or vineyards.

If the land is presently being cropped, or has been cropped in the past and is still capable of being cropped, it should be designated as cropland. If the status is questionable, the assessor's best judgment is required until support for non-cropland is provided by the taxpayer and a more precise determination can be made.

AGRICULTURAL LAND VALUATION (Continued)

DEFINING LAND USE (Continued)

NON CROPLAND

1. Building Sites including driveways or access roads.
2. Non Crossable streams or waterways.
3. Forest or Timber ground.
4. Dedicated ponds or dam area (not occasional ponding in field).
5. Permanent Pasture.
6. Land under permanent easement that precludes any type of crop production.
7. Land with access limitations or limited ability to be cropped.

If the land is precluded from producing a crop it should be considered non-cropland. This could be buildings, trees, water, access or size. Properties with issues such as these should be defined as non-cropland.

SPECIAL CONSIDERATIONS – NON CROPLAND

A foundation of the corn suitability rating system is that the ratings are related to the productivity of the land. Under unusual or unique circumstances the land may require an additional adjustment for the system to be used most effectively. This should be done only in unusual or limited circumstances.

SPECIAL CONSIDERATIONS – CROPLAND

Still other situations may exist warranting adjustments to cropland, which are not specifically shown on the soil map. In these cases, assessor judgment is required, based upon limitations or restrictions to normal crop production. Further investigation is recommended for these types of areas. These areas should be treated as non-cropland.

1. Isolated small areas: Soils that are normally tillable but have use limitations imposed by their small area and/or location. For example, a part of a field may be isolated from the remainder of the field by a drainage way that is not crossable with tillage equipment. The area may be well suited for intensive row crop production, but due to the limited accessibility the use of the land is restricted to pasture. Judgment must be applied to properly evaluate this situation.
2. Areas in which soils requiring artificial drainage cannot be drained due to lack of an outlet or other physical limitation.
3. Areas subject to overflow by streams. The assessor will need to investigate if the CSR2 rating for the area under question has an EJ adjustment for flooding already included in the rating for that geographic location and soil.
4. Areas which may be physically capable of producing income, but due to permanent conservation easements, are legally precluded from all typical agricultural uses.

SOIL SURVEY SYSTEM

The first step for the assessor is to obtain the most current soil survey for the county. The corn suitability rating survey provides the geographic area for each soil mapping unit by soil scientists of the Iowa Agricultural and Home Economics Experiment Station and the USDA Natural Resource Conservation Service. Current Department of Revenue guidelines require the use of the most current corn suitability ratings, as supplied by the United States Department of Agriculture, National Resource Conservation Service. In most counties this would be the CSR2 maps.

The soil inventory process is the steps taken to itemize and measure the amount of each soil type and the associated CSR ratings within each parcel. This same process is then repeated for each agricultural land parcel. Since the early 1990's the process has moved from a paper format to a digital format. While the processing medium has changed due to rapid advances in GIS technology, the basic processes are still the same.

GIS is the acronym for Geographic Information System. It is a computerized mapping system. Computerized mapping has the ability to measure, process, and analyze multiple layers of information providing measured acres of each soil type within each parcel. The inventory also computes the CSR points for each parcel of land based on the composition of the parcel, the soils within the parcels as well as the associated CSR points and acres of each. This information is used in the overall valuation process for the county as well as the distribution of the productivity value to each parcel.

AGRICULTURAL LAND VALUATION (Continued)

DATA

The mapping layers necessary for processing parcel information for valuation purposes include:

- o Parcel Polygons
- o Soil Maps
- o Land Use/Land Exemption

PARCEL POLYGONS

The parcel polygon mapping layer may be in different formats including shape file, personal geodatabase, etc. To be most effective, the map layer needs to be the most up to date reflection of the parcel inventory with divisions (plats or splits) and parcel consolidations completed at the time of processing.

Digital mapping does not represent an official survey of the parcel inventory and as a result there may be differences between the measured acres and the deeded or assessed acres by parcel. This is also the result of imperfections in the digital layers. Gross acres less any right of way acres would result in net Acres. Net acres less any exempted acres would result in taxable acres. Depending on the software application the first steps in processing the parcel inventory include information in regard to the gross and or net acres for each parcel of agriculturally classed property. Property records in regard to assessed acres are the statutory responsibility of the County Auditor and therefore any corrections to these acres needs to be authorized by the auditor. For clarification purposes assessors need to provide information on agricultural parcels based on the following definitions:

- o Gross Acres: Acres that include any right of way, usually represents the acres listed on the deeded documents if any (some deeds do not define the number of acres)
- o ROW: Defined as right of way acres for roads, drainage, railroad, etc.
- o Net Acres: gross acres less right of way acres
- o Exempt Acres: Acres that are not taxable but reported on the abstract such as slough bill, forest/fruit tree exemption
- o Taxable Acres: Acres on which taxes are actually paid.

SOIL MAPS

Original paper soil maps have been converted into an electronic layer which can be utilized by a digital geographic information system. They are available for downloading at the link provided below. A review of the soil layer in conjunction with the parcel layer should be done to illuminate any line discrepancies between the layers along the county borders. The assessor should consult with GIS professionals to resolve these issues.

The CSR2 ratings can be downloaded at the link provided below, and should be incorporated into the process according to the soils processing software requirements.

Information can be found at the Web Soil Survey from the NRCS.

LAND USE LAYER / EXEMPTION LAYER

The assessor may utilize the USDA FSA-published Common Land Unit digital data, or other reliable sources, and current aerial imagery. Or alternatively, other methods to develop the land use layer may be used. Since 2008, the USDA Farm Service Agency crop/non-crop designations are no longer available to the public so this particular data source may not reflect the current status of properties within the county.

As part of or separate from the land use layer any approved and qualifying exemptions need to be mapped digitally as well. Digital imagery can assist in determining the boundaries of forest reserve and other exemptions. Field reviews may be required on some parcels. Calculating the exempted acres using digital processes and comparing to the exempted acres granted on the exemption application is suggested.

The land use/exemption layer needs to be maintained as the use of the land may change over time. These changes may include removal or adding building sites; land that is cleared for crop production; and other changes. The assessor is responsible for proper distribution of the productivity value based on the use of the property so managing these changes as they occur is required.

AGRICULTURAL LAND VALUATION (Continued)

NON-CROP ADJUSTMENT FORMULA

The assessor is to follow the rule as published in Iowa Administrative Code 701-71.3(1)b and shown by example in 701-71-3(d). Under typical circumstances, this is the only adjustment that should be made to agricultural land identified as “non-crop”. The Iowa Department of Revenue will calculate and publish the adjustment factor for each county based on the five year average differences in cash rent between non-irrigated cropland and pasture land as published in the rule. Under unusual or extreme circumstances an additional adjustment may be necessary.

Assessor judgment will need to be applied to determine if there are extreme or unusual circumstances.

THE PROCESSING STEPS

STEP ONE: The assessor is required to review any differences between the gross, net and taxable acreage and the calculated acreage within the mapping system. Large discrepancies between the two pieces of data may mean the parcel is drawn incorrectly or that the acreage listed by the Auditor needs to be reviewed. This review likely will necessitate researching the deeds and plats for the parcels on the tax rolls to ensure the digital parcels reflect the recorded documents. The recorded documents are the source information and any changes to the mapping system will need to reflect these source documents. Clear discrepancies will need additional research for resolution.

STEP TWO: The various digital layers of information including; parcel polygons; soils, and land use and exemptions layers are used to populate the GIS software application. Additional information required for actual calculation of individual CSR counts on the various parcels includes:

- Average county crop area CSR ratings
- Land use codes
- Land use adjustment percentage (calculated by IDR)

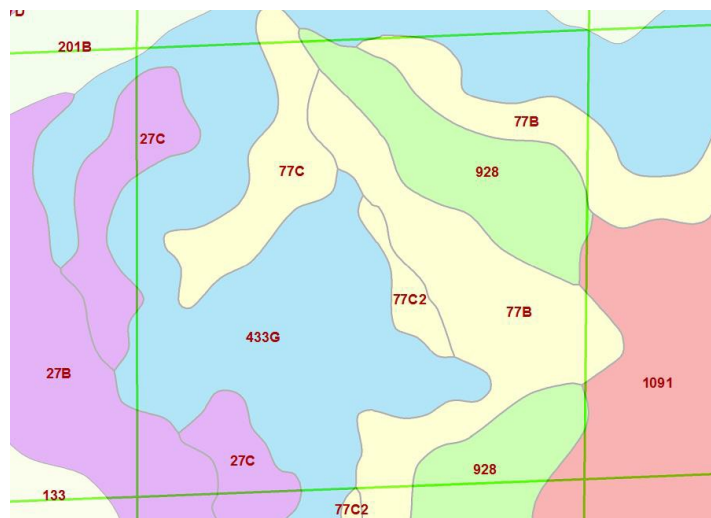
STEP THREE: Processing the aforementioned information with the software application results in:

- Calculated CSR points for each soil per parcel for cropland
- Calculated and adjusted CSR points for each soil per parcel for non-cropland
- Calculation of adjusted CSR points for exempted acres
- Total CSR points per parcel
- Total CSR points for the assessing jurisdiction
- Average cropland CSR rating for the county

A sample parcel map, soil map, land use layer and soil calculation report are shown below.



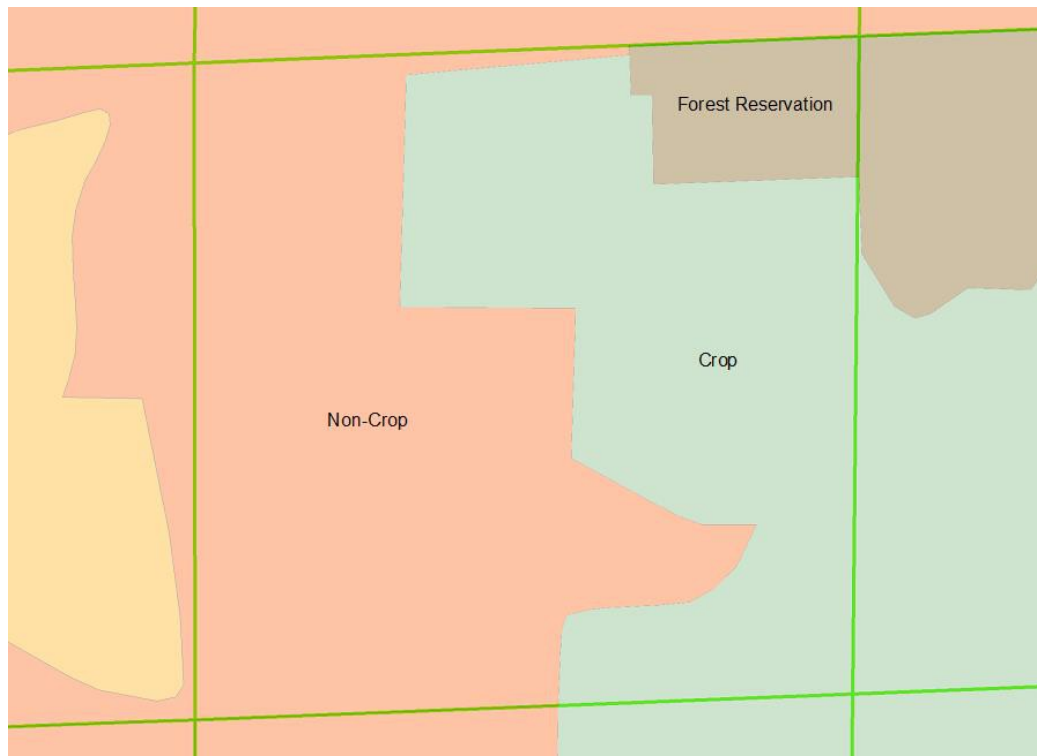
PARCEL MAP



SOIL MAP

AGRICULTURAL LAND VALUATION (Continued)

THE PROCESSING STEPS (Continued)



LAND USE / EXEMPTION LAYER

Description	Soil Symbol	Soil Name	CSR	Net Acres	Unadjusted CSR Points	Adjusted CSR	Adjusted CSR Points
Crop	91	Primghar	77	12.00	924.00	77.00	924.00
Crop	92	Marcus	72	8.00	576.00	72.00	576.00
Non-Crop	92	Marcus	72	5.00	360.00	43.20	216.00
Crop	310B	Galva	67	10.00	670.00	67.00	670.00
Non-Crop	310B	Galva	67	5.00	335.00	23.30	116.50
Total				40.00	2,865.00		2,502.50
					Value / CSR Point	X	\$30.00
					Total Valuation		\$75,075

AGRICULTURAL LAND VALUATION (Continued)

DISTRIBUTION OF ASSESSED VALUE

The aggregated total CSR points for cropland and adjusted CSR points for non-cropland provides the foundation for the distribution of the total productivity value to each parcel. Assessors distribute the valuation throughout the jurisdiction so that each parcel of real estate is assessed at its actual value as defined in Iowa Code 441.21.

Sample calculations:

1. Value per acre as calculated via the productivity formula	2,500
X number of agricultural acres assessed in the jurisdiction	
and reported to the Department on jurisdiction	<u>360,000</u>
= the targeted agricultural land and building value	\$900,000,000
2. Total County Agricultural Value	\$900,000,000
Less County Ag Building Value	
(adjusted by Agricultural Building Factor)	<u>\$100,000,000</u>
= Jurisdiction Ag Land Value	\$800,000,000
3. Jurisdiction Ag Land Value	
Divided by Total Adjusted CSR Points	\$800,000,000
(sum of cropland CSR and adjusted non-cropland CSR points)	<u>36,463,081.13</u>
= Assigned Dollar per CSR Point Value	\$21.94

Multiply each parcel's total CSR points by the dollars per CSR = Total Land Value per Parcel