



United States Department of Agriculture



Farmland Soil Classes of Massachusetts



Massachusetts

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Introduction

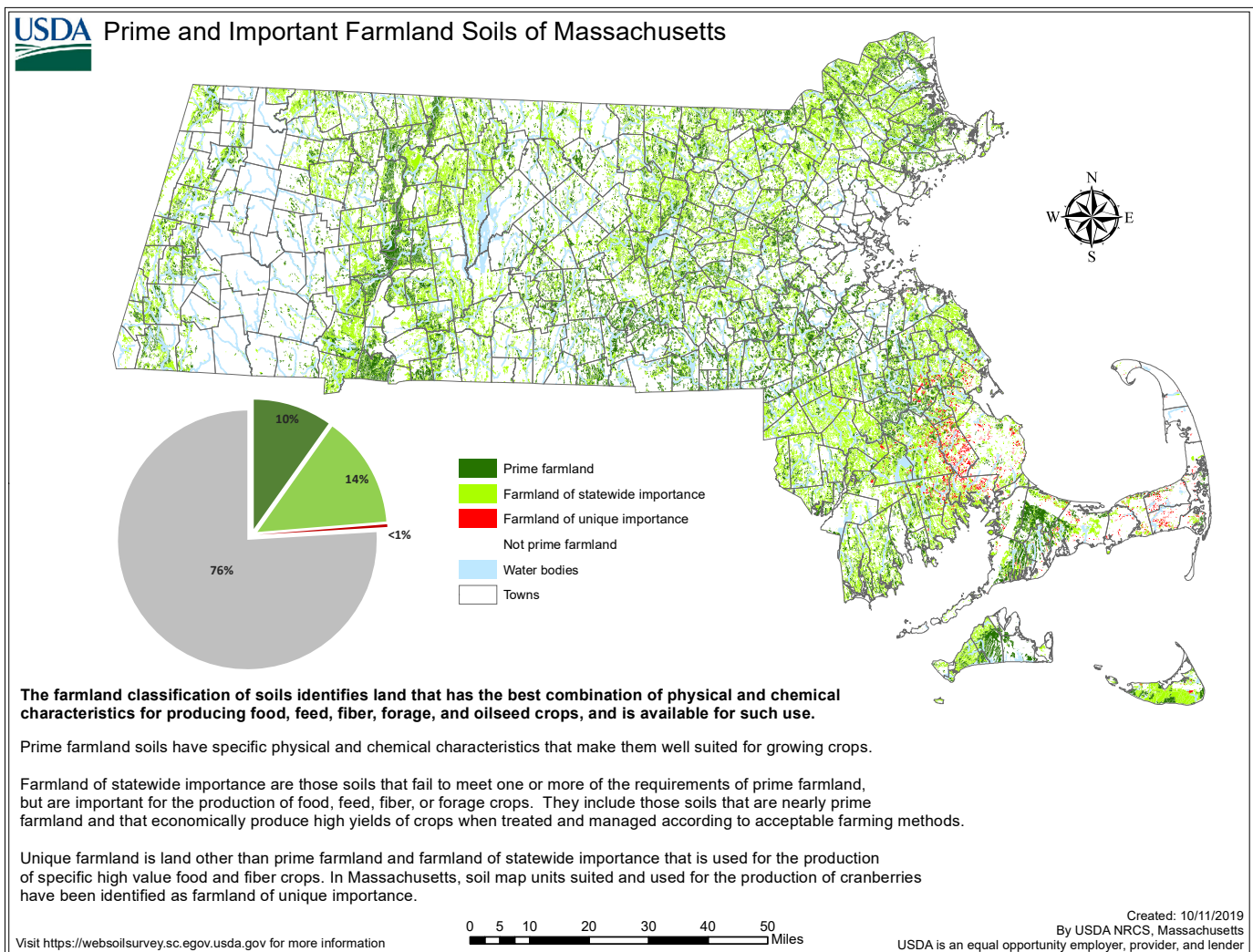
The process of classifying soils as important farmland involves identifying land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, and oilseed crops and is available for such use.

Code of Federal Regulations (7 CFR Part 657.5) important farmland criteria are applied to the predominant characteristics of soil survey map units, as mapped by the National Cooperative Soil Survey. The current and official soil survey data is published by the USDA Natural Resources Conservation Service (NRCS) and can be accessed through the Web Soil Survey (<https://websoilsurvey.sc.egov.usda.gov>).

In FY2020, Massachusetts revisited and revised the farmland criteria for soils in the state. These changes resulted in the following changes to the Farmland Class Ratings:

- ➔ 3,200 acres changed from Farmland of Statewide Importance to “meets no important farmland class”
- ➔ 6,100 acres changed from Prime Farmland to Farmland of Statewide Importance
- ➔ 800 acres changed from Farmland of Statewide Importance to Prime Farmland
- ➔ 125,500 acres changed from “meets no important farmland class” to Farmland of Statewide Importance
- ➔ 254,000 acres changed from Farmland of Unique Importance to “meets no important farmland class”

The most significant changes include the removal of Histosols that are not used in cranberry agriculture from the Farmland of Unique Importance category and the addition of map units on 8 to 15% slopes with stony and very stony surface phases to the Farmland of Statewide Importance category.



There are four farmland classes assigned to soil survey map units of Massachusetts that are identified in Web Soil Survey: Prime Farmland, Farmland of Statewide Importance, Farmland of Unique Importance, and Not Prime Farmland. In addition, certain lands are designated Farmland of Local Importance. These lands are designated on a town-by-town basis and are listed in the NRCS Massachusetts Field Office Technical Guide (<https://efotg.sc.egov.usda.gov/#/state/MA>).

Prime Farmland

Prime Farmland soils have specific physical and chemical characteristics that make them well suited for growing crops. Criteria for the prime farmland classification in Massachusetts are:

- available water capacity of 3.5 in (8.9 cm) or more¹ within a depth of 40 in (1 m) or the depth to an impermeable layer if less than 40 in (1 m); and
- pH between 4.5 and 8.4 in all horizons within a depth of 40 in (1 m)²; and
- water table, if present, not shallower than 15 in (38 cm) during May through October; and
- infrequent (less often than once in 2 years) or no flooding during May through October; and
- the product of Kw (erodibility factor, whole soil) of the mineral soil surface and percent slope is less than 2.0³; and
- permeability rate of at least 0.06 in (0.15 cm) per hour in the upper 20 in (50 cm); and
- upper 6 in (15 cm) of the soil surface contains less than 10 percent rock fragments by volume coarser than 3 in (7.6 cm) diameter; and
- not more than 0.1 percent of the soil surface is covered by stones 10 in (25cm) to 24 in (60cm) diameter, and/or boulders >24 in (60 cm) diameter; and
- less than 2 percent bedrock exposures.

Farmland of Statewide Importance

Farmland of Statewide Importance are those soils that fail to meet one or more of the requirements of Prime Farmland, but are important for the production of food, feed, fiber, or forage crops. They include those soils that are nearly Prime Farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Criteria for defining this land are determined by NRCS in coordination with the appropriate state agency or agencies.

Soils that do not meet all Prime Farmland criteria are Massachusetts Farmland of Statewide Importance if the following criteria are met (bold font indicates criteria varying from that for Prime Farmland):

- **available water capacity of 2.0 in (5.1 cm) or more within a depth of 40 in (1 m); and**
- pH between 4.5 and 8.4 in all horizons within a depth of 40 in (1 m); and
- water table, if present, not shallower than 15 in (38 cm) during May through October; and
- infrequent (less often than once in 2 years) or no flooding during May through October; and
- **the product of Kw (erodibility factor, whole soil) of the mineral soil surface and percent slope is less than 4.2⁴; and**
- permeability rate of at least 0.06 in (0.15 cm) per hour in the upper 20 in (50 cm); and
- **upper 6 in (15 cm) of the soil contains less than 35 percent rock fragments by volume coarser than 3 in (7.6 cm); and,**
- **not more than 3 percent of the soil surface is covered by stones 10 in (25 cm) to 24 in (60 cm) diameter, and**
- not more than 0.1 percent of the surface is covered by boulders >24 in (60 cm) diameter; and
- less than 2 percent bedrock exposures.

1 Available water capacity needs determined from “Conservation Irrigation Guide for Massachusetts, 1981”

2 Entire pH data range is applied to the pH criterion. All soil survey map unit components that otherwise meet prime farmland criteria have mineral horizon pH ranges w/in the CFR criterion. Tillage and accepted agricultural practices negate the pH limitation where attribute relative value is less than 4.5

3 Slope range values applied to this criterion exclude the lowest whole number in the range to separate overlap with the adjacent lower slope phase as follows: 0-3, 4-8, 9-15.

4 Product of K and slope criterion based on historical precedent, MA Soil Conservation Service document, “Additional Farmland of State or Local Importance”, 1/17/1986.



Farmland of Unique Importance

Farmland of Unique Importance is land other than Prime Farmland and Farmland of Statewide Importance that is used for the production of specific high value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods.

In Massachusetts, soil map units suited and used for the production of cranberries have been identified as Farmland of Unique Importance. The soil properties essential for cranberry production are unique; low soil pH, abundant supply of water, the ability to hold water, and access to a source of sand.

Not Prime Farmland

Soils that do not meet the criteria for Prime Farmland, Farmland of Statewide Importance, or Farmland of Unique Importance are classified as not prime farmland. These soils may be in agricultural use but may require more intense management to maintain high agricultural yields.

Farmland of Local Importance

In some local areas there is concern for certain additional farmlands for the production of food, feed, fiber, forage, and oilseed crops, even though these lands are not identified as having national or statewide importance. Where appropriate, these lands are to be identified by the local agency or agencies concerned. In places, additional farmlands of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Disclaimer

Except for the National Soil Characterization Database, soil surveys seldom contain detailed site-specific information and are not designed for use as primary regulatory tools in site-specific permitting decisions, but they are useful for broad regulatory planning and application.

Official Soil Survey Information is public information and may be interpreted by organizations, agencies, units of government, or others based on their own needs; however, users are responsible for the appropriate application of soil survey information.

NRCS will not accept reassignment of authority for decisions made by other Federal, State, or local regulatory bodies. NRCS will not make changes to Official Soil Survey Information or any supplemental soil mapping for purposes related solely to State or local regulatory programs (NRCS General Manual, 430 402.6).

Massachusetts farmland classifications are determined for soil survey map units by NRCS based on recorded soil survey data using the criteria and qualifiers listed below. Because soil characteristics vary within soil survey map units and soil survey is mapped at a specific scale, soil survey information is not designed for site-specific permitting decisions. On-site soil investigation is recommended when the focus is on intensive use of small areas.



Massachusetts qualifiers to criteria for assigning Important Farmland Designations to soil survey map units

In addition to the criteria identified in the sections above, the following qualifiers were applied in assigning important farmland designations for soil map units.

Criteria for the designation Prime Farmland per Code of Federal Regulations (CFR)

The Prime Farmland class is assigned to soil map units, the major component/s relative value data⁵ for which meet prime farmland criteria per 7CFR 657.5, as edited to exclude soil properties and climate not relevant to Massachusetts and to quantify adequate available water holding capacity.

Qualifiers for data application to Massachusetts soil survey map unit Prime Farmland criteria per CFR:

- Map units having a predominance of soils of coarse-loamy or coarse-silty particle size class overlying densic contact on 0 to 8% slopes with available water capacity data values <3.5 in (8.1 cm), and that meet remaining criteria per CFR are designated Prime Farmland. Although attribute data indicates the available water holding capacity minimum of 3.5 in (8.1 cm) is not met, these soils maintain a reservoir of moisture that supports plant growth due to reduced gravitational water loss and meets criteria per CFR of adequate moisture supply for the crops commonly grown. This qualifier is applicable to soil map components with moderately coarse to medium textured mantles overlying lodgment till.
- Where the product of K and slope percent is 2 or less for the lower part of a 3 to 8 percent map unit slope phase range but exceeds 2 for the upper part of the slope range, and remaining criteria per CFR are met, the map unit is designated Prime Farmland.
- Map units that meet all Prime Farmland criteria per CFR except the relative value data representing the predominant components reflects available water capacity of less than 3.5 in (8.9 cm) through the upper 40 in (1 m) but has sufficient available water capacity in the upper profile, are designated Prime Farmland. This qualifier is applicable to soil survey map unit components having moderately coarse to medium textured mantles overlying coarse textured deposits.
- Complexes and Associations - Soil map units with more than 50 percent components that meet any of the above scenarios are designated prime.

Criteria for the designation Farmland of Statewide Importance

The Farmland of Statewide Importance class is assigned to soil map units, the predominant composition of which does not meet criteria for Prime Farmland and have all the characteristics listed in above sections.

Qualifiers for data application to Massachusetts Farmland of Statewide Importance criteria:

- Where the product of K and slope percent is 4.2 or less for the lower part of an 8 to 15 percent map unit slope phase range but exceeds 4.2 for the upper part of the slope range, and remaining criteria are met, the map unit is designated Farmland of Statewide Importance.
- Complexes and Associations - Soil map units with more than 50 percent components that meet the above criteria are designated Farmland of Statewide Importance.

⁵ Relative value refers to the value assigned to specific data elements in the National Soils Information System. Application of anomalous or non-representative values to important farmland criteria may result in inaccurate class placement. The consideration of the characteristics of the soil map unit as a whole overrides point specific data as determined by Massachusetts NRCS staff.





Important Farmland Soil map unit designation overriding scenarios

Application of anomalous or non-representative data elements to important farmland criteria may result in inaccurate class placement. The consideration of the characteristics of the soil survey map unit as a whole as assessed by Massachusetts NRCS staff overrides point specific data.

K factors and available water capacity data for the same nominal component may vary among soil survey areas resulting in different data-derived farmland classes. The characteristics of the predominant condition based on acreage extent will be applied state-wide for Prime Farmland and Farmland of State-wide Importance designations.

The following address specific scenarios where calculations based on attribute data may inaccurately place a map unit in Prime Farmland or Farmland of Statewide Importance classes. Soil map units having any of the following characteristics are precluded from important farmland designations:

- ➔ A major component that is shallow to lithic contact. Complex slopes, surface stones and boulders associated with these map units, and very shallow components within these landscapes are significant limitations to agriculture.
- ➔ Slope phase range that includes 20 percent or more. Per recommendation from MA NRCS ecological sciences staff, 20 percent slope or greater is limiting for equipment operations.
- ➔ Hydric soil composition greater than or equal to 50 percent.
- ➔ Quartzipsamment composition greater than or equal to 50 percent. These soils are droughty with inherently low fertility.
- ➔ A major component of urban land and/or major component classified to level above series (i.e. Udorthents).
- ➔ Map unit complexes associated with the undulating, rolling, irregular slopes of the Cape Cod terminal moraines.

Soil map units having any of the following characteristics are precluded from the designation Prime Farmland:

- ➔ Composition of soil components in the sandy-skeletal particle size class greater than or equal to 50 percent.
- ➔ Slope phase range that exceeds 8 percent.⁶

Farmland of Unique Importance

Soil survey map units designated as Farmland of Unique Importance are those suitable for, and have an established history of cranberry production. The Farmland of Unique Importance designation is excluded from soil survey areas with few or no lands with cranberry production.

⁶ Based on data, some map units meet Prime Farmland criteria on the lower part of the 8-15 percent slope range. About a dozen map units with available water capacity >3.5 inches and Kw of .1, .2, .15, or .17 were noted, all of which have loamy surface textures and parent material like other map units with higher Kw factors. The decision to exclude slopes greater than 8 percent from Prime Farmland is based on the preponderance of attribute data for similar soils.

Sources for standards and information on describing and interpreting soils

National Soil Survey Handbook, title 430-VI. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_054242

Soil Survey Manual Soil Science Division Staff. 2017. C. Ditzler, K. Scheffe, and H.C. Monger (eds.). USDA Handbook 18. Government Printing Office, Washington, D.C.

The Field Book for Describing and Sampling Soils, version 3.0. Schoeneberger, Wysocki, Benham, and Soil Survey Staff, 2012.





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