

## Patent Report Information and Map Key

**To Teacher:** Here is the raw data from the US Patent Reports from 1843 to 1850. These locations were used to make the raw data points for the mapping activity. Potato rot data by state appears in the intensity and/or time it appeared (newest data will be at the bottom of the list.) Answer key [Figure A] and additional map information is provided.

Year	Information	Location
1843	<p>Failure and disease is mentioned on pages 60-63, 136. Student Readings on page 68 and 69.</p>	<p><u>Eastern New York:</u> Rot first reported in Cattaragus &amp; Chautauque Counties. Rot also reported in Otsego and Schoharie County.</p> <p><u>Pennsylvania:</u> Delaware and Philadelphia are cited for experiencing potato rot.</p> <p>Mention of rot near the river in <u>New Hampshire, Connecticut and New Jersey.</u></p> <p>Failure had occurred near along the <b>port cities</b> of NYC and Philadelphia and has moved inland to the largest potato producing state of New York. Suggesting a <b>relocation diffusion</b> pattern.</p>
1844	<p>This year is the most prolific in reporting of the Potato Rot.</p> <p>There is a map of Counties for <b>New York state</b> [Fig B] at the end of the document that advanced students may plot.</p> <p>There is a note that it has not extended more than 45N or 37N.</p> <p>This article makes reference that this rot has been known in <b>Nova Scotia</b> for years. (pg. 79-85) On page 207 there is mention of shipments from Nova Scotia to Boston.</p> <p>Page 217, it is noted that imported Irish potatoes have no</p>	<p><u>New York:</u> Reports of rot from Buffalo, Utica, southern towns of Eric County, Genessee County, Wyoming, Lake Champlain (Northeast and North), Oswego, Madison, Onondaga, Salem, Thompkins, Chemung, Yates, Stueben, Allegany, Cayuga, Cortland, Oneida, Schoharie, Rensselaer, Ulster, Delaware, Dutchess, Putnam, Westchester, Rockland, Long Island and Orange Counties. There are some reports of rot along the Great Lakes Border. Has penetrated <b>west</b> across the state. There are reports of slight Rot in Niagara, Cattaragus and Columbia.</p> <p>In New York State, there is a <b>contagious diffusion</b> pattern of epidemic spread of the disease.</p> <p><u>Pennsylvania:</u> Rot found in Columbia, Luzerne, Dauphin, Schuylkill, Beaver, Washington, and central counties. The upward spread of the rot ends in Armstrong and Clearfield counties. <i>(Note: There is Lesser Rot than last year.)</i></p> <p><u>New Hampshire:</u> Rot reported in Claremont, Central and Central West, near River, and South. Many reports that all potatoes in NH are very rotten.</p> <p><u>Massachusetts:</u> Rot found near the ocean and in Hampden, Hampshire, Franklin Counties, Greensfield, Barre, Pittsfield, and Westfield near the Connecticut River. There is no rot reported in the North East.</p> <p><u>Vermont:</u> Rot is reported from Green Mountain and Berkshire to Canada</p> <p><u>Connecticut:</u> Rot central &amp; southwest, worst near the river. (Hampden, Hampshire, Franklin)</p> <p><u>New Jersey:</u> Rot found Central and near the River. <i>(Note: There is Lesser Rot than last year.)</i></p> <p><u>Ohio:</u> Rot in Twinsberg &amp; upper locations only, Northwest near Indiana. Reported along the outline of the Great Lakes and western edge of Cleveland and northeast corner of Trumbell.</p> <p><u>Maine:</u> Some rot found in Piscataquis County, but generally <b>no rot in Maine.</b></p> <p>NO ROT MENTIONED IN: Indiana, Illinois, Michigan, and Wisconsin.</p> <p>As it spreads from state to state, students should see spread via <b>hierarchical diffusion.</b></p>

	rot.	
1845	<p>Rot has spread to <b>Northern and Middle States.</b></p> <p>Many reports of Rot tend to follow the <b>Connecticut River</b>, [Fig C] which can be geographically challenging. There is an image of the states that the river flows through.</p> <p>The patent reports also have <b>percentages</b> lost, which could be used as an extension to this activity.</p>	<p><u>New York:</u> The west and Northwest begins to become infected with rot (Albany County, Rensselaer County, Washington and Essex.) The rot has become better in Otsego, Schoharie, Yates, Chemung, Seneca and Wayne.</p> <p><u>Pennsylvania:</u> Rot in Philadelphia, Bucks county, Lehigh, Susquehannah (near Maryland), and in the Southeast (Lancaster and Chester counties).</p> <p><u>Vermont:</u> Reports more failure than last year in the lower part of the state and Northeast due to potato rot. (Albans)</p> <p><u>Massachusetts:</u> There are reports of rot Northeast, Central East and West whereas the central part of the state had been better this year. There had also been less failure along the Southwestern section of the Connecticut River.</p> <p><u>New Jersey:</u> No place data, but reported potato rot.</p> <p><u>Ohio:</u> North and Northeast reported rot, near the Scioto River and Ohio River near PA.</p> <p><u>Maine:</u> Rot reported in the center of the state, near Augusta, Lincoln County and Calais.</p> <p><u>Maryland:</u> Reported rot in the Northeastern part of the state.</p> <p><u>Indiana:</u> Rot had ruined 20% of their potato crop in Will County and the Southeast.</p> <p><u>Michigan:</u> Rot reported in Berrein and Cass Counties ONLY!</p>
1846	<p>Due to massive drought, there is no data from the US Patent Reports.</p>	<p>North and Middle states still report some rot.</p> <p>Since the Oomycete <i>P. infestans</i> requires cool, wet temperature a hot drought removed that part of the disease triangle, so it could not survive and thrive in those environmental conditions.</p>
1847	<p>The Patent Reports that many of the Southern states had been spared from the potato rot. This is not because of climate, rather that these states grew sweet potatoes which are not a host for <i>P. infestans</i>.</p> <p>Late blight is now a large problem in tomatoes in NC (and the south) because</p>	<p><u>New York:</u> The entire state is devastated from rot in all areas. (Cayuga, Wayne, Yates, and Delaware)</p> <p><u>Pennsylvania &amp; New Jersey:</u> Rot has now spread into new areas.</p> <p><u>New Hampshire &amp; Vermont:</u> Still has potato rot is still as bad as it has been previous years. (Charlestown)</p> <p><u>Massachusetts:</u> Reported in Pembroke.</p> <p><u>Ohio:</u> Massive crop failures to the rot all around the state.</p> <p><u>Maine:</u> Crop has been described at this point a “total loss” due to the rot.</p> <p><u>Maryland:</u> Rot now found in the South and Western parts of the state.</p> <p><u>Virginia:</u> Some reports of rot in the West and possibly some in the east, but certainly in Princess Anne County.</p> <p><u>Connecticut:</u> This state is not free from rot, but has reported that this year the rot has</p>

	<p>they are grown here and is a good climate for <i>P. infestans</i> growth, especially when it is cool and wet.</p>	<p>lessened and the potatoes are doing much better.</p> <p>ROT REPORTED IN: Indiana, Iowa, Delaware, Michigan, and Wisconsin.</p> <p>NO ROT REPORTED IN: North Carolina, South Carolina, Tennessee, Kentucky, Louisiana and other southern states.</p>
1848	<p>The potato rot is reported as more local (pg 116)</p> <p>This idea that the rot did not spread across to KY and other areas does have a spatial relationship to the <b>Ohio River</b>. [Fig D] Students may not be aware of the state boundaries created by this river and a map is supplied.</p>	<p><u>New York</u>: Reports of rot in the Northwest, Central and Western parts of the entire state. (Rot reported in Franklin County, Columbia, Newberg, Orange, Queens, Steuben, Chautauque, St. Lawrence and especially bad in Madison County.)</p> <p>This year, the <b>Northwestern states</b> were hit with more rot than ever. The heaviest disease was reported in <u>Ohio, Michigan, Wisconsin, Iowa, Indiana, and Illinois</u>.</p> <p>The worst rot is reported in <u>Ohio</u> is in Licking County. However, no rot is reported south of the Ohio River.</p> <p>Due to tapered potato planting, the rot had lessened in <u>New Jersey, Massachusetts and Connecticut</u>.</p>
1849	<p>Since the pathogen is dependent upon weather conditions, an extension of this activity could relate <b>climate overlays</b> (temperature &amp; precipitation) to determine a correlation between <i>cold/wet years</i> and <i>more severe outbreaks</i>.</p>	<p><u>Pennsylvania</u>: Philadelphia reports rot especially in Delaware County.</p> <p><u>Maine</u>: Has largely rebounded from the loss of 1848.</p> <p><u>New Hampshire</u>: Rot has lessened.</p> <p><u>Massachusetts &amp; Vermont</u>: No Reports of Rot!</p> <p><u>Rhode Island</u>: Reports of rot along the sea (Narragansett Bay.)</p> <p><u>Illinois</u>: Rot reported in Granville (also in 1848.)</p> <p><u>Indiana</u>: No rot reported in Floyd County.</p>
1850	<p>The US Patent Reports also has interesting letters that could make for excellent student readings on the</p>	<p><u>Pennsylvania</u>: Largest cases of state potato rot since 1846. (Page 168) Reported in floral retreat near Columbia and Lancaster County.</p> <p><u>New York</u>: Rot reports in Hamptonburg (Orange County), Wheeler (Stueben County), Hunter (Green Co), basically all over.</p> <p><u>New Hampshire</u>: Rot reported in Rockingham, Greenland, Rye, Newington, and Portsmouth.</p>

<p>causes, treatment for and prevention of the potato rot.</p> <p>They give interesting insight to ideas on pathogens long before <b>Koch's Germ Theory of Disease</b> (1890).</p>	<p><u>Massachusetts</u>: Rot reported in Richmond, South Hadley Falls (Hampshire County), West Springfield, Newton, Middlesex, Essex, Plymouth County, Barnstable County, and the Western Parts of the state.</p> <p><u>Rhode Island</u>: Rot reported all over the state.</p> <p><u>Vermont</u>: Some rot reported near Walden and East Montpelier (Washington County.)</p> <p><u>Michigan</u>: Rot reported in Ann Arbour (Washtenaw County.)</p> <p><u>Maine</u>: Rot had lessened for a good year for potatoes. Rot reported in Jonesborough (Washington County)</p>
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## Map Key for Mapping Activity [Figure A]

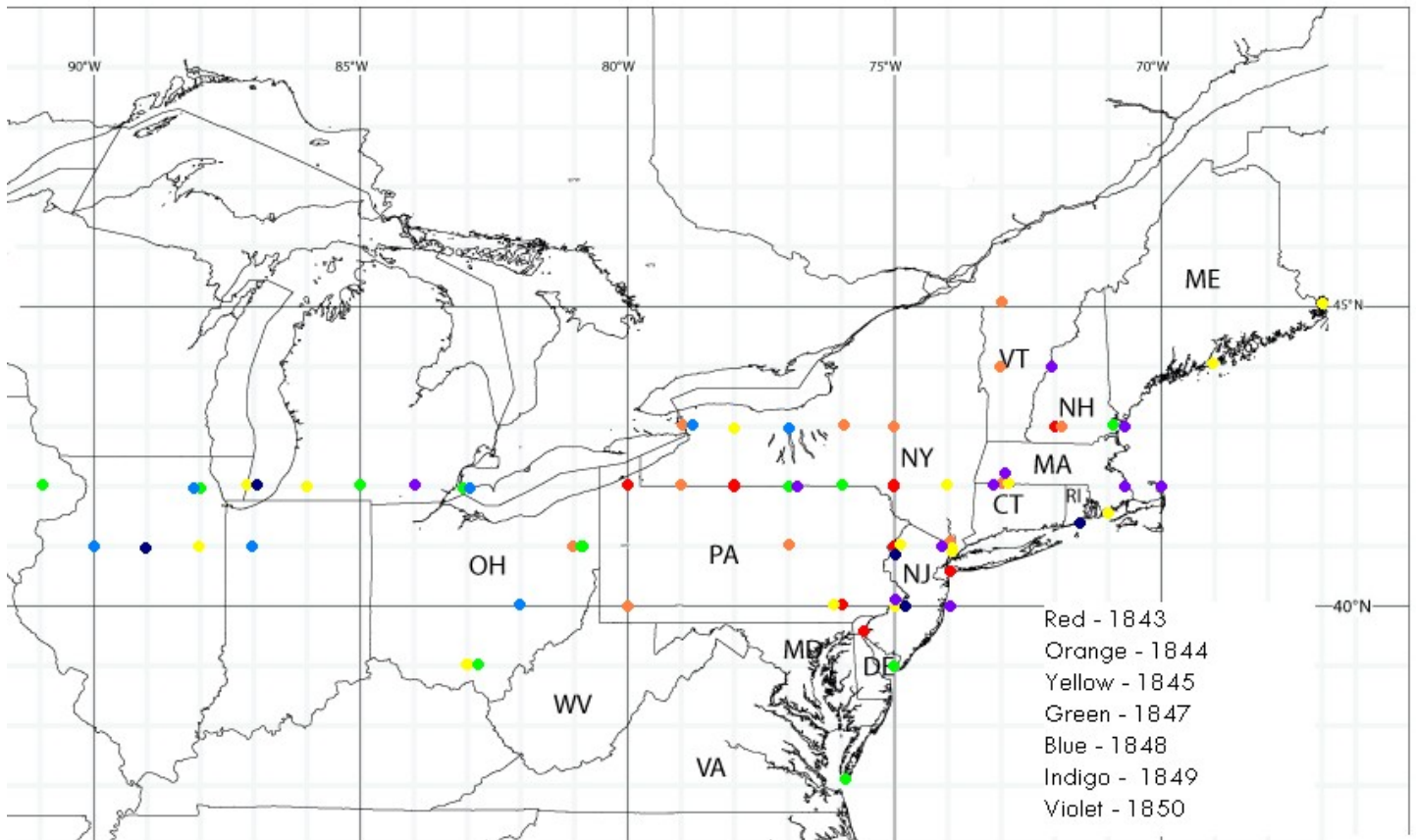


Image from: NOAA, data points plotted by Rebecca Hite.

# Map of Counties in New York City (Current) [Figure B]

**B**

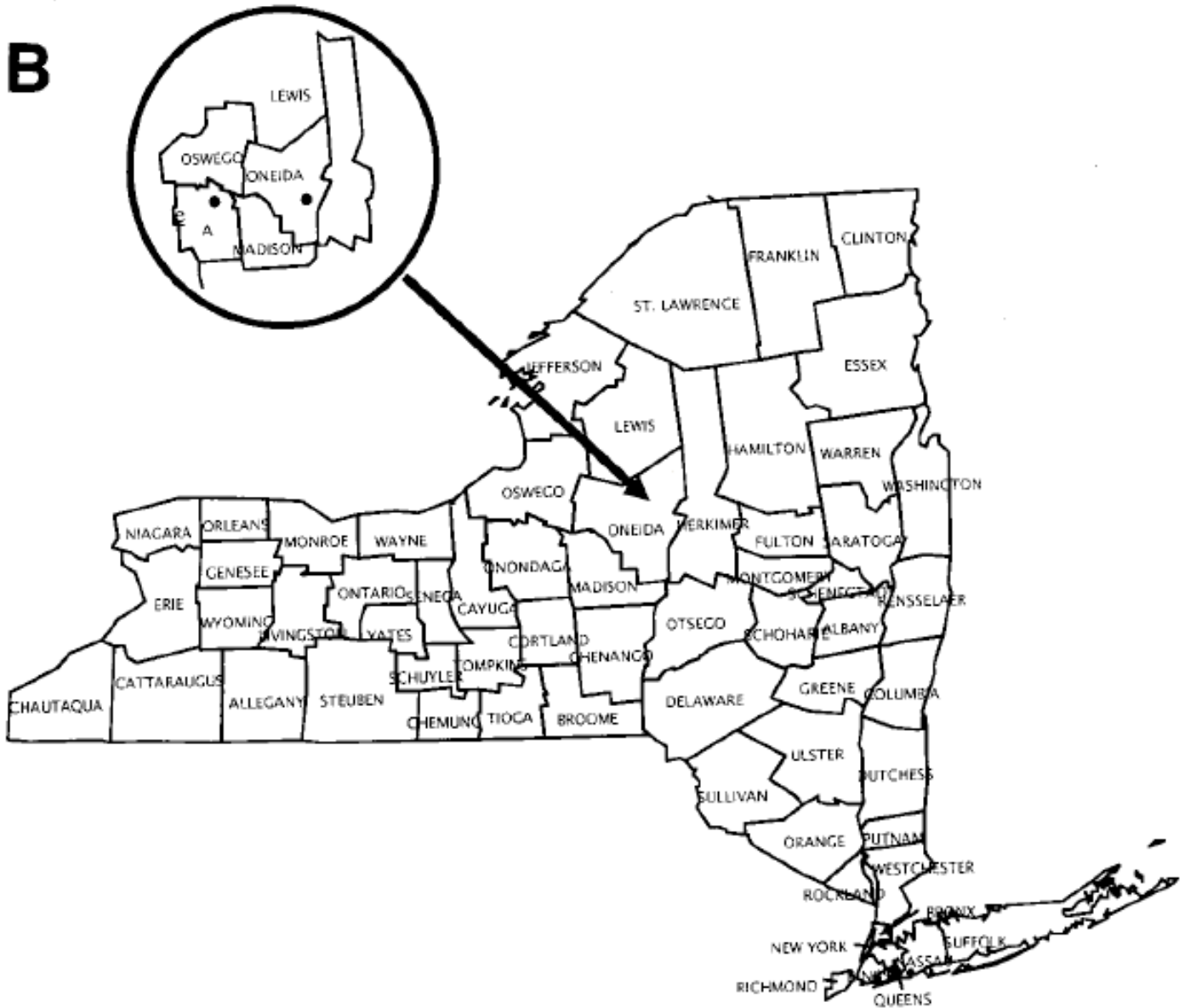


Image from: <http://www.apsnet.org/online/feature/lateblit/0929-01F.pdf>

Archival 1845 map available at <http://digitalgallery.nypl.org/nypldigital/dgkeysearchdetail.cfm?strucID=253285>

## The Connecticut River [Figure C]

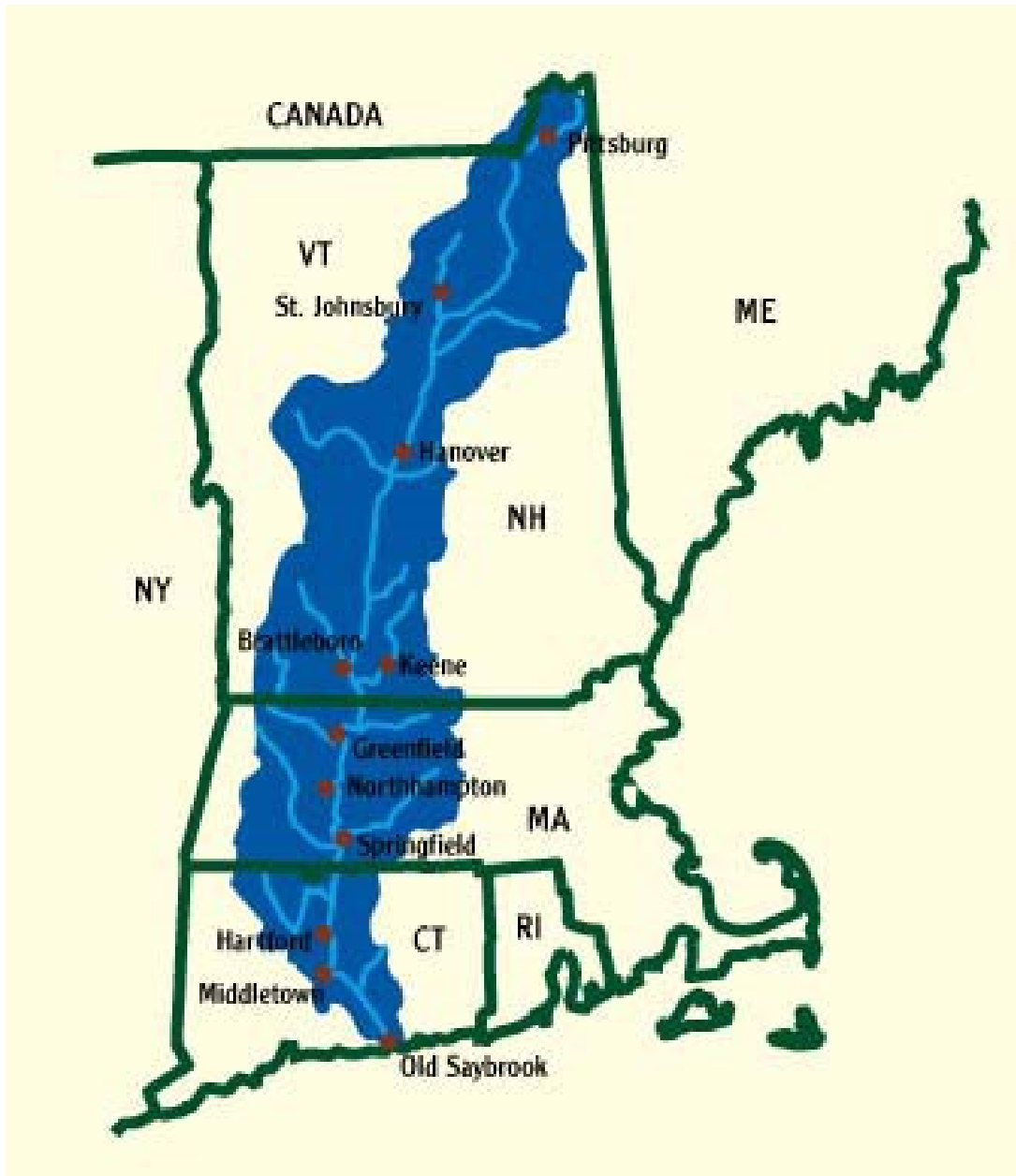


Image from: <http://www.springfieldlibrary.org/images/connriver2.jpg>

## The Ohio River [Figure D]



Image from: <http://upload.wikimedia.org/wikipedia/commons/b/b4/Ohiorivermap.png>