

PRELIMINARY RESULTS OF IRRIGATION WATER SAMPLING

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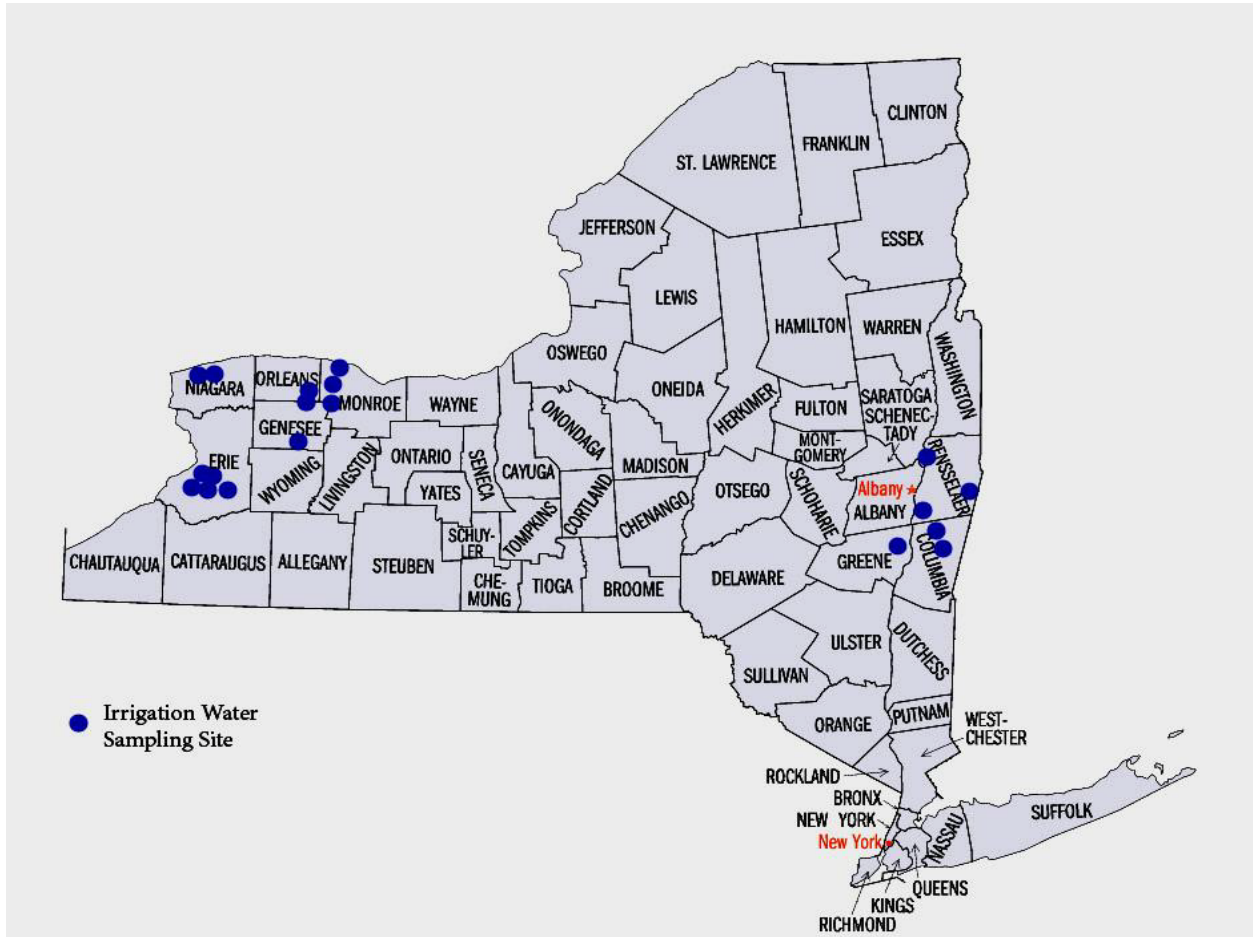
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Water is critical to the production of fruit and vegetable crops. In some years, supplemental water is required and growers often use water that is sourced from ponds, stream, rivers, and canals to irrigate their crops. This water is open to the environment and susceptible to plant and foodborne pathogen contamination. When this water is applied overhead, the contamination can move from the source water directly to the fresh produce. In a survey of New York vegetable growers that we conducted in 2008, 60% of respondents stated that they used surface water during crop production as either an irrigation or spray mix source. Plant pathogens from every major group, bacteria, viruses, fungi, nematodes, and water molds have been found in irrigation water sources. The plant pathogens *Phytophthora capsici*, the cause of Phytophthora Blight, and *Pseudomonas syringae* pv. *tomato*, the cause of Bacterial Speck of Tomato, have been found in irrigation water in several parts of the country. The goal of this project is to investigate if these and other vegetable pathogens are present in surface irrigation water sources in New York State. Additionally, we are testing the feasibility of using ultraviolet (UV) light as a means to decontaminate irrigation water, preventing the spread of pathogens.

In May 2010 monthly sampling of irrigation water from about 20 vegetable farms located throughout the state of New York began. The locations of sampling sites are shown on the map. Water samples were analyzed for multiple pathogens (listed in the table on the next page), including those that are known to be found in irrigation water and are a significant problem on vegetables in New York. Hundreds of potential pathogen isolates have been cultured from irrigation water and are currently being identified. Along with plant pathogens, we are working with colleagues in food science to test for indicator organisms for the potential human pathogens *Escherichia coli* and *Salmonella enterica*. The presence and spread of human pathogens in irrigation water is a growing food safety concern.

An ultraviolet (UV) treatment system will also be evaluated as a potential means to treat water found to be infested with the pathogens. A commercial UV processing unit used for unfiltered cider that is capable of continually adjusting for solids content and turbidity will be used to carry out the treatment. There are high hopes for this UV system to treat irrigation water because of the similar qualities of unfiltered juices and irrigation water, qualities such as high turbidity, color and the presence of large amounts of particulate matter. The system will be tested with multiple surface irrigation water sources and in the presence of multiple pathogens.

Current Irrigation Water Sampling Sites



Current plant pathogens that are being investigated in irrigation water

PATHOGEN	DISEASE
<i>Phytophthora capsici</i>	Phytophthora Blight
<i>Clavibacter michiganensis</i> subspecies <i>michiganensis</i>	Bacterial Canker and Wilt of Tomato
<i>Pseudomonas syringae</i> pv. <i>tomato</i>	Bacterial Speck of Tomato
<i>Xanthomonas campestris</i> pv. <i>campestris</i>	Black rot of Cole Crops
<i>Xanthomonas campestris</i> pv. <i>vesicatoria</i>	Bacterial Spot of Pepper