Cities import the majority of their food supply, and the transportation necessary to move food from rural areas to urban centers is a significant source of greenhouse gas emissions. While New York City has attempted to minimize these emissions by increasing its supply of locally grown food, most of these efforts have been applied to increasing the agricultural production of the city’s highly limited ground-level space. As a result, New York City’s abundant rooftop space—much of which is suitable for agriculture—remains unused. Hydroponic greenhouses constitute an effective way to use this space, as they can be placed on rooftops that cannot support the weight of soil-based agriculture, and also produce yields approximately 15 times greater than that of conventional urban farming. While their construction cost does constitute a barrier, Gotham Greens, a New York City-based operator of hydroponic greenhouses, has demonstrated the commercial viability of large-scale hydroponic greenhouses in New York City. Yet hydroponic systems remain underutilized, largely due to a lack of knowledge concerning its suitability. This study aimed to calculate the portion of suitable rooftop space in two zip codes in northern Brooklyn, as well as the amount of New York City’s lettuce demand that could be met by the full use of that area. In addition, policy recommendations designed to encourage the proliferation of hydroponic greenhouses were analyzed and suggested as they pertain to New York City. This paper’s findings present hydroponics as an underutilized yet highly suitable type of urban agriculture for New York City, as well as similar highly urbanized areas.