



CLIMATE-SMART URBAN AGRICULTURE SUPPORTING HISTORICALLY UNDERSERVED PRODUCERS

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ROLE OF NITROGEN

Nitrogen is one of the three most important macronutrients in plant development. Nitrogen is a part of chlorophyll which gives plants their green color. Nitrogen is crucial in protein and enzyme development, additionally water and nutrient uptake. Nitrogen has a direct effect on yield, quality, and encourages uptake of other vital nutrients such as Potassium and Phosphorus.

Vegetative growth (foliage) is dominated by Nitrogen, increasing photosynthetic surface area of plants. There are many forms of nitrogen, being mobile in its Nitrate from (NO3) and immobile as ammonium (NH4).







DEFICIENCY

Nitrogen deficiency can be identified in many ways. Visually, a general yellow discoloration called chlorosis will be seen. Chlorosis is the yellowing of tissue due to the lack of chlorophyll. The lowers leaves of the plant will be the first to show signs of deficiency as nitrogen travels to new growth. Slowed growth and yellowing at the leaf margins can also be signs of deficiency.



(Butterhead Lettuce Nitrogen Deficiency : USDA ARS, 2020)





HYDROPONIC MANAGEMENT

Dry fertilizers are a common way to add Nitrogen to your system. A NPK blend, Ca(NO3)2, and KNO3 are all compounds used in specific proportions to correctly fertilize for nitrogen. Anhydrous ammonium, and urea are another form fertilizer which are generally cheaper, utilizing less nitrate. Surprisingly using a combination between ammonium and nitrate fertilizers have shown to exhibit better growth (Garcia, 2020). Frequent testing to ensure proper inorganic N levels is important, the chart below shows a guideline in ppm for a few different crops.

Maintaining proper pH is equally as important for N absorption, Nitrogen has a wide band for absorption, but optimal range is between 5.5 and low 6's. This range will also allow for other macro and micro nutrients to be absorbed.

Major Elements, mg/L (ppm)					
Crop	N	Р	к	Ca	Mg
Cucumber	230	40	315	175	42
Eggplant	175	30	235	150	28
Herbs	210	80	275	180	67
Lettuce	200	50	300	200	65
Melon	186	39	235	180	25
Pepper	175	39	235	150	28
Tomato	200	50	360	185	45

Source: Schon. M., 1992. in Proceeding of the 13th Annual Conference on Hydroponics Society of America, ed. San Ramon, CA





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