PRECISION NUTRIENT APPLICATION TECHNOLOGIES IN CROP PRODUCTION

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Sustaining high crop production is hindered by soil infertility and many other factors. Yet, conventional supply of nutrients to improve soil fertility is raising concerns. Adoption of precision nutrient supply with a win–win alternative is recommended to ensure sustainability of crop production. Globally, different technologies are developed and utilized, hence there is need to comprehensively understand the advances and technologies used to deliver nutrients to crops. Therefore, the objective of this review was to assess the key technologies used to optimize nutrients supply to crops. Our synthesis revealed that nutrient variable rate technology, fertigation, and foliar fertilization were the common precision nutrient supply technologies used. Variable rate nutrient application delivered nutrients from both mineral and organic fertilisers matching exact crop requirements. Fertigation technologies included fertigation proportional fertilization and quantitative fertilization. In proportional fertilization and quantitative fertilization, rate of nutrient supply depended on the water-drip irrigation rate. Overall, the efficiency of nutrient delivery to crops was high in variable rate technology though it's utilization was hampered by barriers such as costs and inadequate internet coverage. We conclude that even if precision nutrient supply promises to provide a long term remedy to sustainable crop production, its wider adoption is only possible with commercial production of high value crops that ensure that farmers get over breakeven point.