

Orchard Management for Hard Cider Production: Influence of Nitrogen Fertilization on Tannin Synthesis, Yeast Assimilable Nitrogen, and Fermentation Kinetics

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Two experiments were carried out using soil and foliar applied nitrogen fertilizers to investigate how nitrogen influences the concentrations and composition of YAN; juice from these experiments were fermented and the production of hydrogen sulfide (H_2S) tracked. Different rates of foliar urea application beginning six weeks before harvest increased YAN by as much as 319% compared to the Control. A high rate of soil applied calcium nitrate fertilizer increased juice primary amino nitrogen (PAN) by 103% relative to the Control. In both fertilizer studies PAN constituted over 90% of YAN. Fertilization increased fermentation rate, but no consistent relationship was found with fertilization rate and H_2S synthesis. There was no influence of nitrogen fertilization on polyphenol concentrations. The increases in YAN demonstrate that nitrogen fertilization is an effective means of increasing juice YAN while not impacting important sensory attributes such as polyphenols.