

COPPER DEFICIENCY IN WALNUTS
CORRECTIVE AND INVESTIGATIVE

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ABSTRACT

Copper deficiency was confirmed with tissue analysis. High rates of Kocide 101 applied repeatedly corrected deficiency for the season. Affected trees were dying back, and had essentially no production before corrective measures were attempted.

OBJECTIVE

Determine cause of peculiar growth on walnut trees through tissue analysis. After cause determined, attempt to correct problem. Investigate reason for problem. Evaluate other tissues for sensitivity to analysis.

PROCEDURE

1. Rate 8 trees from no symptoms to severe symptoms, collect leaf samples and analyze to see what nutrient most closely fits symptoms.
2. Apply soil and foliar corrective treatments.
3. Record visual symptoms.
4. Analyze shell and kernel to see how sensitive this tissue is for nutritional analysis.

RESULTS

The leaf sampling procedure outlined above indicated the problem to be copper deficiency. Soil injections of copper sulfate and a chelated copper gave no relief. Five foliar sprays every other week from early April to mid-May of 10 lbs/100 gal. of Kocide 101 gave apparently complete season-long correction. The longevity of this correction method is not known at this time. Nut tissue analysis of the shell and kernel fraction was very sensitive to copper (see Table). Soil analysis seemed to indicate that high soil P may be responsible for tying up soil Cu and making it unavailable to affected trees. Soil Cu was the same in affected and unaffected trees.

<u>NUT TISSUE ANALYSIS</u>				
	B	Shell Fraction		Comments
		Cu	Zn ppm	
Nuts from good trees	18	4.5	0.5	Well formed nuts
Nuts from bad trees	18	1.0	0.7	Misshaped shells
Kernel Fraction				
		Cu	Zn ppm	
Nuts from good trees	--	10.7	30	No shrivel, some dark
Nuts from bad trees	--	1.6	40	All shriveled, all dark