



# HEALTHY GARDEN TIPS

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University of California Cooperative Extension – Napa County

## BORON IN IRRIGATION WATERS

Adopted from USDA Technical Bulletin #448

Boron toxicity damage to plants is traceable to the use of irrigation waters with boron content in excess of 1 ppm.\* UC Cooperative Extension uses the following ranges to interpret boron content of irrigation waters:

Below 0.5 mg/l	Satisfactory for all crops.
0.5 – 1.0 mg/l	Satisfactory for most crops; sensitive crops may show injury (may show leaf injury but Yields may not be affected).
1.0 – 2.0 mg/l	Satisfactory for semi-tolerant crops. Sensitive crops are usually reduced in yield and vigor.
2.0 – 10.0 mg/l	Only tolerant crops produce satisfactory yields.

There is no economically feasible method of removing boron from irrigation water. Similarly, there is at present no chemical or soil amendment which can economically be added to the soil to render the boron nontoxic. However, growers in some areas are learning to live with marginal boron and salinity conditions by: 1) Maintaining fertility levels slightly above the usually “optimum,” and 2) By irrigating a little more frequently than “normal.”

### RELATIVE BORON TOLERANCES OF PLANTS

	Sensitive (0.5 to 1.0 mg/L boron)	Somewhat tolerant (1.0 to 2.9 mg/L boron)	Tolerant (2.0 to 10.0 mg/L boron)
least tolerant	Lemon	Lima bean	Carrot
	Grapefruit	Sweet potato	Lettuce
	Avocado	Bell pepper	Cabbage
	Orange	Tomato	Turnip
	Thornless blackberry	Pumpkin	Onion
	Apricot	Zinnia	Broad bean
	Peach	Oat	Gladiolus
	Cherry	Milo	Alfalfa
	Persimmon	Corn	Garden beet
	Kadota fig	Wheat	Mangel
	Grape (Sultanina & Malaga)	Barley	Sugar beet
	Apple	Olive	Palm ( <i>Phoenix canariensis</i> )
	Pear	Ragged robin rose	Date palm ( <i>Phoenix dactyifera</i> )
	Plum	Field pea	Asparagus
	American elm	Radish	Ather ( <i>Tarnarix aphylla</i> )
	Navy bean	Sweet pea	
	Jerusalem artichoke	Pima cotton	
	Persian (English) walnut	Acala cotton	
	Black Walnut	Potato	
most tolerant	Pecan	Sunflower	

**\*NOTE:** It is seldom just boron – usually when boron is high, sodium, chloride or other heavy metals are also present, thus the UC ANR leaflet #2995 is recommended.

May 2012

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