

# Sample Container and Storage Temperature for Paclobutrazol Monitoring in Irrigation Water

Paclobutrazol is a commonly used plant growth retardant used in the horticulture industry. Paclobutrazol when used at proper concentrations and application timing can provide growers an efficient method for regulating plant growth and size. However, paclobutrazol is stable in water, and there are concerns that paclobutrazol spray not in contact with target plant canopies can reach nontarget surfaces such as benches and floor, and subsequently result in dried spray residues. During later irrigation events, dried spray residues may dissolve in excess irrigation water and be transported to either a holding tank or retention pond. Reapplication of irrigation water contaminated with paclobutrazol can cause stunting and deformed growth in nontarget floriculture crops. This risk indicates a need for periodic monitoring of accumulated paclobutrazol in ponds and storage tanks. There are established standards for collecting water samples, yet none is specific to the collection of water sample for paclobutrazol analysis. The objective of this research was to determine if the material of the sample container or storage temperature

affects paclobutrazol stability after 3, 14, or 30 d of storage.

In two experiments, paclobutrazol was mixed in concentrations ranging from 0.04 to 0.2 mg·L<sup>-1</sup> and stored in polyethylene, clear glass, or amber glass containers at temperatures of either 4 or 20 °C. Paclobutrazol concentration was measured at 3, 14, and 30 days after the start of each experiment.

Across the two experiments, there were no consistent trends in reduction of paclobutrazol concentration with respect to container material or storage temperature (Table 1). These data suggest that paclobutrazol is stable in collected water samples for at least 30 days, and that either glass or polyethylene containers are suitable for collecting greenhouse water samples for analysis of paclobutrazol concentration. A minimum volume of 100 mL was determined to be the optimum to analyze water samples with diverse paclobutrazol concentrations.

Table 1. Paclobutrazol concentration in collected water samples (200 mL volume) stored for 3 to 30 d at either 4 or 20 °C (39.2 or 68.0 °F), and in either plastic or glass bottles.

Initial concn (mg·L <sup>-1</sup> ) <sup>z</sup>	Temp (°C) <sup>y</sup>	Bottle	Time in storage (d)			
			3	14	30	
			Paclobutrazol concn (mg·L <sup>-1</sup> )			
0.04	4	Glass	0.042	0.040	0.051**	
		Plastic	0.041	0.041	0.046	
	20	Glass	0.041	0.037	0.047	
		Plastic	0.039	0.037	0.045	
	LSD <sub>0.05</sub> <sup>w</sup>		NS	NS	0.004	
	Control <sup>v</sup>		0.041	0.039	0.046	
	Main effects					
	Temp			0.194	0.082	0.064
	Bottle			0.028	0.498	0.033
	Interaction			0.679	0.849	0.202
0.2	4	Glass	0.175	0.178	0.178*	
		Plastic	0.203*	0.196	0.171*	
	20	Glass	0.174	0.185	0.178*	
		Plastic	0.199*	0.169	0.196	
	LSD <sub>0.05</sub>		0.018	0.018	0.016	
	Control		0.170	0.181	0.205	
	Main effects					
	Temp			0.664	0.122	0.032
	Bottle			0.001	0.921	0.326
	Interaction			0.816	0.011	0.025