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Carotene Content of Sweet Potato (*Ipomoea batatas* Lam.) Roots as Affected by Various Nematicide Treatments¹

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It has been reported (2, 3, 4) that the nematicides Nemagon and Telone C increased carotene content in carrots and sweet corn. Since the carotene content of sweet potatoes is important nutritionally, an attempt was made to extend the observations to this crop and to various nematicides.

The nematicides used and rates applied are presented in Table 1. All experimental plots were located at the Vegetable Research Farm near Salisbury, Maryland, on Norfolk sandy loam soil. The cultivar 'Centennial' was used in 1971; 'Centennial', 'Goldmar' and 'Nemagold' in 1972; 'Centennial' and 'Goldmar' in 1973 and 1975 and 'Centennial', 'Goldmar' and 'Jewel' in 1976. Treatments were replicated 7 times in 1971, 4 times in 1972, and 3 times in 1973, 1975 and 1976. All nematicides were applied 1-2 weeks before transplanting according to recommended procedures. All plots received fertilizer and irrigation according to recommended commercial practices and were harvested when judged to coincide with commercial harvests.

At harvest, a 10 root sample of No. 1 size roots was obtained from each plot and carotene estimated with a Hunter-Gardner color difference meter according to the procedure of Ahmed and Scott (1). Samples were prepared for measurement by two methods, either by cutting the root longitudinally and reading immediately or by blending 100 g of freshly peeled root with 100 ml of water to which 0.1 g of thiourea had been added.

None of the nematicides except Telone C in 1971 were effective in increasing carotene content (Table 1) according to an F test. Cultivar effects were significant at the 5% level in all years but there were no significant cul-

tivar x treatment interactions. The increase in the Hunter "a" value resulting from the use of Telone C corresponds to approximately a 10% increase in carotene.

On the basis of these data it appears that only Telone C was effective in increasing carotene levels in sweet potatoes. It is unknown why Vorlex and DD

which are closely related compounds were not effective.

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Table 1. Average Hunter "a" value of blended samples and half roots obtained from the several nematicide treatments.

Year	Nematicide ^y	Rate	Avg Hunter "a" value		
			Blend	Half root	
1971	Telone C	73 l/ha	25.9*	27.5	
	Telone C	104 l/ha	25.9*	26.8	
	Control	—	24.4	26.4	
1972	Nemacur 15G	6.8 kg a.i./ha	24.3		
	Mocap 10G	6.8 kg a.i./ha	23.1		
	Mocap 6EC	9 kg a.i./ha	23.2		
	Vorlex	65.5 l/ha	24.3		
	DD	187 l/ha	24.3		
	Control	—	24.3		
1973	DD	187 l/ha	30.8	34.1	
	Mocap 10G	9 kg a.i./ha	29.1	33.7	
	Mocap 6EC	9 kg a.i./ha	29.1	33.4	
	Nemacur 3EC	6.8 kg a.i./ha	29.4	33.6	
	Control	—	29.2	33.4	
1975	Vorlex	65.5 l/ha	26.2		
	Mocap 6EC	9 kg a.i./ha	27.2		
	Mocap 10G	9 kg a.i./ha	28.2		
	Vydate 10G	6.8 kg a.i./ha	27.1		
	Nemacur 3EC	6.8 kg a.i./ha	27.7		
	K Azide 10G	22.4 kg a.i./ha	26.2		
	K Azide 10G	33.6 kg a.i./ha	28.4		
	Control	—	27.4		
	1976	Vorlex	65.5 l/ha	26.0	
		NA 060	65.5 l/ha	28.2	
NA 061		42 l/ha	26.9		
NA 055		65.5 l/ha	27.0		
Mocap 10G		6.8 kg a.i./ha	26.2		
Telone II		112 l/ha	26.4		
Furadan 109		6.8 kg a.i./ha	28.5		
Nemacur 15G		4.8 kg a.i./ha	28.1		
K Azide 10G		33.6 kg a.i./ha	26.5		
Control		—	27.2		

^zChemical names and formulations are as follows: *Telone C* (1,3-Dichloropropene and related chlorinated hydrocarbons) 85%; chloropicrin (trichloronitromethane) 15%. *Nemacur* (Ethyl 3-methyl-4-(methylthio) phenyl (1-methyl-ethyl) phosphoramidate) formulated as 3EC. *Mocap* (0-Ethyl S, S, dipropyl phosphorodithioate) formulated as a 10% granular and 6EC. *Vorlex* (Methylisothiocyanate), 20%; chlorinated C₃ hydrocarbons including dichloropropenes, dichloropropene, dichloropropane and related chlorinated hydrocarbons 80%. *DD* (1,3-Dichloropropene, 1-2, dichloropropane). *Vydate* (Methyl-N¹, N¹-dimethyl-N-[(methyl-carbamox)oxy]-1-thioxamimidate). *K Azide* (10% Potassium Azide). *Furadan* (2,3-dihydro-2,2-dimethyl-7-benzofuranyl methyl-carbamate). *NA 055*, *NA 060* and *NA 061* are formulations of methylisothiocyanate produced by Nor-Am. *Telone II* (1,3-Dichloropropane and related chlorinated hydrocarbons) 92%.

*Significantly different from control (5%).

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