observed earlier impairing the transport of water and minerals (CPCRI, 1985). Hence, the altered mineral metabolism observed in the present study might be due to impairment of absorption and transport of minerals due to root rotting and vascular plugging.

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QUALITY CHARACTERS OF GROUNDNUT KERNEL AS INFLUENCED BY MEPIQUAT CHLORIDE (MC)

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ABSTRACT

Investigations were carried out to study the effect of Mepiquat Chloride (1, 1-dimethyl piperidinium chloride) on certain quality characters of groundnut kernel. Foliar application of MC on 35 days after sowing increased the oil content by 4.6 per cent. Carbohydrate content decreased, and protein content showed no significant change in response to MC.

KEY WORDS: Mepiquat chloride, Kernel, Groudnut quality.

Compounds such as nicotiniums, quarternary ammonium carbamates, hydrazines, phosphoniums, substituted cholines, substituted maleamic and succinamic acids, steroid synthesis inhibitors, limonene derivatives, pyrimidine and pyridones have been found as growth retardants with promising properties (Mary Ritzel Corcoran, 1974). Growth retardation is primarily induced by inhibition of gibberellin biosynthesis between ent-kaurene and ent-kaureonic acid. In addition to this, evidence is available that the growth retardarts interfere with the oxidative metabolism of abscisic acid and phytosterols as well as with the formation of cytokinins and ethylene (Rademacher, 1989) Apart from shortening of internodes and restriction of undesirable vertical and horizontal growth, growth retardants help plants in withstanding drought, disease and cold injury Growth retardants influence the increases in chlorophyll content, shelling percentage, total dry

Table 1. Effect of MC on protein, carbohydrate and oil content in groundnut kernels.

Concentration (ppm)		Protein (%)				Carbohydrate (%)				Oil (%)			
		0	100	125	150	0	100	125	150	0	100	125	150
DAS	25	25.82	25.90	25.79	25.93	20.36	20.28	19.78	19.74	50.48	50.61	50.69	50.68
	35	25.88	26.02	26.31	26.14	20.28	18.62	17.92	17.85	50.47	51.86	52.74	52.72
	45	25.90	25.94	26.00	25.98	20.46	19.29	18.98	18.97	50.40	51.75	51.81	51.77
		CCC	25.93	Control	25.89	CCC	19.34	Control	20.83	CCC	50.93	Control	50.38
		D	C	D X C		D	C	D X C		D	C	D X C	
C.D. (P.0.05)		NS	NS	NS		0.40	0.46	0.80		0.33	0.38	0.66	

DAS : Days After Sowing ; D : Days ; C : Concentration

matter production, yield and oil content. Chlormequat chloride, daminozide, paclobutrazol, ethephon and mepiquat chloride constitute the commonly used growth retardants in agriculture and horticulture.

Mepiquat chloride (1, 1-dimethyl piperi dinium chloride), a plant growth retardant has been found to suppress the excess vegetative growth and increase the yield and quality characters. Since the study on plant growth retardants, except CCC is very limited in groundnut, a field experiment was carried out to study the effect of mepiquat chloride on groundnut kernel quality characters.

MATERIALS AND METHODS

Experiments were conducted at Department of Crop Physiology, Tamil Nadu Agricultural University, Coimbatore during 1991-92. The experimental method included foliar spray of MC on groundnut cv. CO 1 at three concentrations viz., 100 ppm, 125 ppm and 150 ppm and water spray (0 ppm) on three stages viz., 25 DAS (Days After Sowing), 35 DAS and 45 DAS. CCC was sprayed at the stage of 45 DAS alone, for comparison. The experimental design followed was randomised block design with three replications. The type of soil in the experimental field was red sandy loam with available N, P and K of 190.2, 39.5 and 558.2 kg ha^{-1}. Recommended fertiliser dose of 17 : 34 : 54 kg ha^{-1} of N : P : K was applied in the field under irrigated condition. Protein content of the groundnut kernel was estimated following the method of Alikhan and Young (1973) and for total carbohydrate estimation, method suggested by Somogyi (1952) was adopted. Oil content of the kernel was estimated using NMR (Nuclear Magnetic Resonance) unit (Model Minispec P-28).

RESULTS AND DISCUSSION

The present study on the influence of growth retardants on the quality characters of kernel showed that protein content was not altered much by growth retardants. Only a numerical increase was observed by the treatments. MC and CCC. Among the treatments, MC 125 ppm on 35 DAS resulted in higher protein (26.3 per cent), although the difference was not significant from the unsprayed control (25.9 per cent). A similar trend was observed in CCC treatment also. Rajinder Paul *et al.* (1985) reported that foliar spray of CCC 100 ppm after flower initiation increased the protein. A marginal increase in protein was possible due to CCC 100 ppm (Ravikumar and Kulkarni, 1988). Abdel-Al *et al.* (1986) and Hedin *et al.* (1988) showed that application of MC 50 g ha^{-1} resulted in increased protein in seed cotton. Studies on different crops using growth retardants showed positive influence on protein, however the results of the present study indicated no significant difference between the chemical treatments and unsprayed control (Table 1).

Both MC and CCC treatments decreased the carbohydrate content of kernels. Plants treated with MC 150 ppm on 35 DAS resulted in a drastic reduction in carbohydrate. MC at higher concentration (150 ppm) on all the three stages of treatment showed significant reduction in carbohydrate. Application of CCC also reduced the carbohydrate significantly. However, the carbohydrate was significantly reduced by Mc

150 ppm on 35 DAS (17.85 per cent) followed by MC 125 ppm (17.92 per cent). The percent reduction in carbohydrate due to MC 150 ppm on 35 DAS was found to be 13 from the unsprayed control. This reduction in carbohydrate due to growth retardants had been reported by Rajinder Paul *et al*, (1985). Zinsou *et al*, (1987) noted reduced carbohydrate due to CCC on *P. erosus*. The lower carbohydrate content might be due to the higher convestion of carbohydrate for synthesis of oil resulting in higher oil and low carbohydrate content in the kernels.

The growth retardants' influence on oil content showed that MC 125 ppm on 35 DAS increased the oil content (52.74 per cent). There was no significant difference between 125 ppm and 150 ppm of MC on 35 DAS. The increased oil content due to CCC was comparatively lesser than the MC treatments on 35 DAS and 45 DAS. The results of the present investigation are in accordance with the works of Das Gupta (1975) who reported that application of CCC 500 ppm showed a marginal increase in oil content. Gurbakshi Singh and Sharma (1982) also reported similar results in groundnut. Application of MC 50 g ha^{-1} showed increased oil content in cotton (Abdel-Al *et al.*, 1986). The positive influence of growth retardants on oil content might be probably due to increased monoterpene synthesis. Similar results have been observed in oilseeds such as sunflower and mustard due to CCC 3000 ppm and 80 ml ha^{-1} (Pando and Srivastava, 1987 and Saini *et al*, 1987).

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