size in all the 9 accessions are grouped under Class I as they all weigh more than 50 g and have good shape. Ercan and Akili (1996) classified pepino fruits according to their weight and shade into two classes viz. Class I: Fruits with good appearance and each weighing 50 g each. It is interesting to note that seed set is considerably higher under the Nilgiris climatic conditions. The seed number per fruit varied from few tens to few hundreds. This may be one of the main reasons for the extremely large size of fruits (a maximum weight of 742 g was recorded at Woodhouse farm). Ercan and Akili (1996) reported that hand pollinated plants produced fruits with an average weight of 115.48 containing 8 seeds, compared to control which produced seeds less fruits 73.44 g mean weight. Pluda *et al.* (1993) observed marked fruit quality variations with change in nutrient composition and levels of salinity. According to Heyes *et al.* (1994) pepino is a potential research tool for investigation.

Among the fruit and juice quality parameters (Table 3) dry matter content, electrical conductivity, sugar content and titrable acidity showed considerable variation among the accessions but fruit specific gravity, juice pH and juice density showed little variation. Dry matter content of fruits varied from 18.52 per cent (SMu-8) to 27.13 per cent (SMu-5); EC from 2.26mS/cm^2 (SMu-7) to 3.12 mS/cm^2 (SMu-4); sugar content from 6.0 to 6.5% (SMu-7 and 8) to 9.0 to 11.0% (SMu-5) and titrable acidity from 12.8 me/100ml (SMu-5) to 18.0 me/100 ml (SMu-4). These results are in accordance with the reports of Redgwell and Turner (1986), who have reported an elaborate account of chemical quality parameters.

The visual quality attributes such as size, shape, symmetry, colour of rind, colour of flesh, olfactory, physical traits like firmness and structure and chemical attributes like flavour, sweetness, acidity etc., are conducive for consumer preference. Accordingly the accessions SMu-1 and 5 offer better preference for dessert purposes because of the higher dry matter and sugar content, lower titrable acidity and better shape and eye appealing colour. SMu-1 and 7 were found to have higher preference for squash and vegetable purposes. Thus among the 9 accessions SMu-1 which is almost similar to colossal variety of New Zealand, seems to be the most ideal one and the aaccession SMu-55 may be preferred for dessert purposes.

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Standardisation of hydrophylic polymers on growth and yield of tomato

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Abstract : An experiment was conducted at Horticultural College & Research Institute, Tamil Nadu Agricultural University, Coimbatore to standardise the hydrophylic polymers on growth and yield of tomato. Three commercially available polymers *viz.* TerraCottem (TerraCottem International, Belgium), Polyvinyl alcohol (Aquatrols corp. of America, USA) and Polyacrylamide (Viterras, Germany) were chosen for the study and used as soil conditioners for tomato cv.Co.3. The results indicated that TerraCottem 4.5g plant $^{-1}$ (T_{10}) improved the plant height, branches per plant, root length, root dry weight, fruits per plant, fruit weight, yield per plant and dry matter production. The results were on par with higher doses of respective polymers. (*Key words: Tomato, Hydrophylic, polymers, Standardisation.*)

Tomato (*Lycopersicon esculentum* Mill.) is obviously the most important vegetable grown, throughout the world. It tops the list of industrial crops because of its outstanding processing qualities. Though irrigated production is the norm for tomato, to a limited extent, it is also grown under rainfed conditions. Development of management practices to maintain soil moisture and improve physical condition of soil would greatly help sustain productivity of tomato under rainfed conditions. There is a possibility to retain soil moisture within the root zone by using the water retentive materials such as hydrophylic polymers. In recent years, the use of these materials for improving soil physical properties, plant growth development and yield has assumed significant importance. Therefore, the study was conducted to standardise the optimum dose of hydrophylic polymers for growth and yield of tomato cv.Co.3.

Materials and Methods

Three commercially available polymers *viz.* TerraCottem (TerraCottem International, Belgium), Polyvinyl alcohol (Aquatrols corp. of America, USA) and Polyacrylamide (Viterras, Germany) were chosen for the study and used as soil conditioners for tomato cv.Co.3.

A pot culture experiment was conducted during October 1996 to January 1997 in a completely randomized blocks design with three replications. The seedlings were raised in seed pans and 25 day old seedlings were planted in earthern pots containing 1:1:1 red earth, sand and farm yard manure. The seedlings were planted in earthern pots and thinned to one vigorous plant after establishments. The polymers were applied to individual pots just before planting at a depth of 15cm. The treatment details are as follows.

T_1 to T_6 - TerraCottem 1.5, 3.0, 4.5, 6.0, 7.5 and 9.0g plant^{-1}.

T_7 to T_{12}- Polyvinyl alcohol 3.0, 6.0, 9.0, 12.0, 15.0 and 18.0g plant^{-1}.

T_{13} to $_{18}$- Polyacrylamide 2.5, 5.0, 7.5, 10.0, 12.5 and 15.0g plant^{-1}.

T_{19} - Control (1:1:1 red earth, sand and farm yard manure)

Results and Discussion

The effect of different doses of polymers was studied by assessing the plant height (cm), branches per plant, days to 50 per cent flowering, root length (cm), root dry weight (g), fruits per plant, fruit weight (g), yield per plant (g) and drymatter production (g).

The results (Table.1) revealed that all the growth and yield traits were increased significantly by the application of polymers. Among the different doses of polymers, TerraCottem 4.5g, Polyvinyl alcohol 15.0g and Polyacrylamide 10.0g per plant showed increased plant height, branches per plant, root length, root dry weight, fruit weight, fruits per plant, yield per plant, drymatter production and earliness in 50 per cent flowering. Similar results were obtained for plant height, root length and root dry weight in *Lingustum* sp., (Taylor and Halfacre, 1986), for drymatter production and yield per plant in tomato and lettuce (Wallace, 1986) for plant height, branches per plant, early flowering and fruits per plant in tomato and chilli (Dhumal, 1993) and for plant height, early flowering and dry matter production in chrysanthemum (Orzolek, 1993).

The increase of plant height could be attributed to elongation of internode due to the proper supply of water and nutrients (Randhawa *et al.* 1981 and Singh *et al.* 1982), which were enabled by the polymers. The increase in number of branches, number of fruits and drymatter production might be due to increased meristematic activity and increased supply of photosynthates owing to proper supply of nitrogen as stored in polymer along with water (Meyer *et al.* 1973). The general improvment in growth and yield traits due to the gel forming hydrophylic polymers might be the result of favourable effects on water holding capacity of soil and its physical conditions such as bulk density, porosity and cation exchange capacity leading to improved nutritional status of soil (Azzam, 1983), which in turn increased the growth of tomato. The results were on par with higher dose of polymers applied. This could be because of spread of polymers away from the root zone leading to the wastage of water and nutrients from such polymers (Still, 1976).

The standardisation of doses of three hydrophylic polymers revealed that TerraCottem 4.5g plant-1 (T3), Polyvinyl alcohol 15.0g plant^{-1} (T11) and Polyacrylamide 10.0g plant^{-1} (T16) improved the plant height, branches per plant, root length, root dry weight, fruits per plant, fruit weight, yield per plant and dry matter production. The results were on par with higher doses of respective polymers.

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Table 1. Effect of graded level of hydrophylic polymers on growth and yield parameters

Treat-ments	Plant height	Branches per plant	Days to 50% flowering	Root length (cm)	Root dry weight (g)	Fruits per plant	Fruit weight (g)	Yield per plant (kg)	Dry matter production (g)
T1	73.1^{fg}	11.8^{f}	60.4^{a}	26.9^{cd}	16.4^{de}	14.8^{de}	42.8^{abc}	0.535^{d}	40.1^{d}
T2	78.6^{bc}	13.2^{d}	60.5^{a}	36.9^{ab}	18.6^{bc}	17.0^{bc}	43.3^{abc}	0.676^{c}	46.1^{bc}
T3	80.6^{a}	14.5^{ab}	55.6^{bc}	40.6^{a}	21.6^{a}	19.3^{a}	45.2^{a}	0.854^{a}	50.6^{a}
T4	78.8^{bc}	14.5^{ab}	55.5^{bc}	40.3^{a}	20.9^{a}	18.9^{a}	45.1^{a}	0.823^{ab}	48.6^{ab}
T5	80.1^{ab}	14.5^{ab}	57.3^{bc}	40.2^{a}	21.2^{a}	19.2^{a}	44.7^{a}	0.850^{a}	49.9^{a}
T6	80.2^{ab}	14.3^{ab}	55.3^{bc}	31.4^{bc}	21.2^{a}	19.2^{a}	45.2^{a}	0.851^{a}	49.7^{a}
T7	70.9^{h}	10.2^{i}	61.1^{a}	26.3^{cd}	13.9^{f}	13.1^{f}	32.3^{f}	0.434^{f}	33.2^{efg}
T8	74.8^{de}	10.9^{gh}	61.2^{a}	26.0^{cd}	15.0^{ef}	13.8^{ef}	31.6^{f}	0.450^{e}	35.4^{e}
T9	76.5^{d}	10.9^{gh}	60.2^{a}	33.8^{ab}	16.3^{de}	14.4^{def}	35.7^{e}	0.507^{d}	38.7^{d}
T10	78.3^{c}	12.2^{e}	55.8^{c}	35.6^{ab}	18.4^{cd}	16.9^{bc}	41.4^{c}	0.656^{c}	44.5^{c}
T11	79.6^{abc}	13.9^{bc}	55.7^{c}	37.5^{ab}	21.7^{a}	18.7^{a}	45.1^{a}	0.831^{ab}	50.3^{a}
T12	79.5^{abc}	13.7^{c}	52.9^{d}	37.4^{ab}	21.6^{a}	18.4^{ab}	45.1^{a}	0.825^{ab}	49.8^{a}
T13	72.8^{g}	10.6^{hi}	60.3^{a}	26.7^{cd}	15.1^{f}	13.4^{ef}	35.1^{e}	0.459^{ab}	31.7^{fg}
T14	74.3^{ef}	11.3^{g}	60.2^{a}	30.4^{bc}	15.2^{ef}	13.7^{ef}	37.9^{d}	0.516^{e}	33.9^{efg}
T15	78.8^{bc}	12.9^{d}	60.8^{a}	34.0^{ab}	16.9^{cdf}	15.5^{cd}	41.6^{bc}	0.647^{d}	34.6^{ef}
T16	80.2^{ab}	14.5^{a}	57.1^{ab}	37.8^{ab}	21.1^{a}	18.5^{ab}	43.9^{ab}	0.812^{c}	49.7^{a}
T17	80.2^{ab}	14.2^{ab}	56.3^{c}	36.3^{ab}	20.8^{a}	18.4^{ab}	43.0^{abc}	0.800^{ab}	49.4^{ab}
T18	80.2^{ab}	14.1^{abc}	55.9^{cd}	37.7^{ab}	20.6^{ab}	18.2^{ab}	43.5^{abc}	0.806^{ab}	48.9^{ab}
T19	64.3^{i}	7.9^{a}	59.8^{ab}	23.3^{d}	10.4^{g}	12.7^{f}	31.2^{f}	0.394^{f}	30.6^{g}
Mean	76.9	12.7	57.8	33.6	18.3	16.5	40.7	0.669	42.9

In a column, means followed by a common letter (s) are not significantly different at 5 per cent level by DMRT

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