DEVELOPMENT OF GROWTH STAGE-BASED FERTIGATION SCHEDULE FOR GREENHOUSE TOMATO [*Lycopersicon esculentum* Mill.) AND GREEN CUCUMBER (*cucumis sativus* L.)

W.A.P. WEERAKKODY, H.P.T.C. WEERASINGHE, A.P. SENAVIRATNE AND T.N.D. SAMARATHUNGA

Department of Crop Science, Faculty of Agriculture, University of Peradeniya

Tomato (*Lycopersicon esculentum* Mill.) and green cucumber (*Cucumis sativus* L.) are two of the most widely grown greenhouse vegetables in Sri Lanka. Since their introduction five years ago, these are fertigated with the standard dosage of Albert's complete fertilizer mixture without adjusting based on the crop, growth stage or climatic conditions. Meanwhile, the method and period of fertigation are highly variable among farmers. As a result, optimum growth and potential yield are never achieved while the fertilizer-use-efficiency is also low.

Therefore, this study was conducted to develop a more efficient fertigation program for these crops, considering growth stage-specific nutrient requirements of each crop. The source and dosage of nutrients and period of application were examined using commercial hydroponic fertilizers and combination of individual plant nutrients.

For the vegetative growth, split application of the standard dosage of Albert's fertilizer mixture resulted the highest dry weight of tomato whereas Hydro fertilizer mixture (KNO_3 347 mg or $Ca[NO_3]_2$ 170 mg with Nutrofol 814 mg in 600 ml per day) gave the highest LAI for green cucumber. The treatment effect on total yield was significant only for tomato. The highest marketable yields were obtained by Hydro mixture for both crops, indicating its contribution for the overall fruit quality. The dosage of Hydro mixture for tomato was $Ca[NO_3]_2$ 515 mg with Krystalon-red 640 mg per day. Meanwhile the standard dosage of Albert's mixture and the combination of individual nutrients (recommended dosage for Autumn crops by the Department of Agriculture, Ontario) showed relatively greater influences in case of different fruit quality parameters.

Hence growth stage-based variable dosages of Hydro fertilizer mixtures performed better yield and fruit quality of greenhouse cucumber and tomato. Average fertigation period of 90 min [900 ml] could be successfully used based on the water and nutrient requirements of the crop. Further intensification of the composition of nutrient formula and the fertigation schedule can be suggested to improve plant nutrition and fertilizer use efficiency of greenhouse tomato and green cucumber.