

Puttanasak Rujihan 2007: Antioxidant Activity and Proline Accumulation in Drought Tolerance of Sugarcane. Master of Science (Agriculture), Major Field: Agronomy, Department of Agronomy. Thesis Advisor: Assistant Professor Rewat Lersrutaiyotin, D.Agr. 104 pages.

Antioxidant activity and proline accumulation were studied in sugarcane under drought condition. Experiments were conducted in both nursery and field conditions using 18 Kps sugarcane clones of Cane and Sugar Research and Development Center, Kasetsart University. In nursery, seed canes were planted in 8-inched pots and watering was stopped when seedlings were 3 months old. Antioxidant activity and proline accumulation were evaluated before stop watering and 4 and 7 days after rewatering. Comparative plant height and green leaf area percentage were collected. In field, RCBD with 3 replications and 4-rows plot was used. Antioxidant activity and proline accumulation were evaluated 4 times having different soil moisture contents in 11-months sugarcane. Results revealed that proline accumulations were not significant different while antioxidant activities were significant different in sugarcane clones under normal condition in nursery. Under drought condition, both proline accumulation and antioxidant activity highly increased and significant difference were observed in sugarcane clones. According to correlation coefficient observation, sugarcane clones having high level of proline accumulation under drought condition in nursery tended to be small stem and high yield sugarcane clones with low antioxidant activity in field. The high level of proline accumulation clones also had less green leaf area and less increase of plant height under drought condition in nursery. Sugarcane clones having high antioxidant activity in both normal and drought conditions in nursery tended to have less tillers and stem number in early stage of growth in field. On the other hand, sugarcane clones having high antioxidant activity in field tended to be low plant height clones. Moreover, sugarcane clones that had less difference in increase height between under drought and normal condition tended to be the high stem diameter clones.

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Thesis Advisor's signature

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