Physiological studies on flowering and fruit set of le conte pear

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This investigation was carried out during the two consecutive seasons of 1989 and 1990 at the Experiment station of the Faculty of Agriculture, Moshtohor. Forty ”Le Conte” pear trees of 11-year-old budded on (Pyrus communis, L) and nearly similar in their growth vigour were devoted to study the effect of shoot topping and growth regulators treatments as follows : -1-”Tap water” as a control.2-Shoot topping of current season growth via leaving 8 leaves per shoot.3-Alar ”SADH” at 1000 ppm.4-Alar ”SADH” at 2000 ppm.5-Alar ”SADH” at 3000 ppm.6-Cycocel ”CCC” at 1000 ppm.7-Cycocel ”CCC” at 2000 ppm.8-Cycocel ”CCC” at 3000 ppm.Alar and Cycocel sprays were carried out at full bloom, while shoot tepping was done in mid-June.The obtained results could be summarized as follows :-1_ TREE GROWTHa- All treatments induced highly significant reduction in shoot length as compared with the control. This was more obvious with moderate and high concentrations of both ”SADH” and ”CCC”.b-Shoot topping and 3000 ppm ”CCC” treatments caused the highest increase in number of leaves per shoot as compared with the control. Meanwhile, all ”SADH” concentrations and moderate and low concentrations of ”CCC” significantly decreased the number of leaves per shoot.c-The leaves of 3000 ppm ”SADH”-sprayed trees had higher dry weight than those of untreated ones ”control”. However, moderate and low levels of ”SADH” and ”CCC” decreased leaf dry weight.d-Shoot topping treatment obviously inereased leaf surface area. On the contrary, ”CCC” and ”SADH” sprays significantly decreased leaf surface area. However, ”CCC” treatments surpassed ”SADH” treatments in their effects. e-Shoot topping treatment as well as ”SADH” and ”CCC” sprays changes leaf index as they decreased leaf length in relation to its width which led to less oblong leaves than those of the control. 2- TREE FLOWERINGa-SADH-sprayed trees and shoot topped trees as well as ”CCC”-treated ones gave higher number of fruiting spurs than those of the control. Anyhow, ”SADH” and shoot topping treatments were more effective than ”CCC” treatments.b-The effect of different treatments on number of flowered spursand percentage of flowered spurs took the same trend of number of fruiting spurs. c-”SADH”, Shoot topping and ”CCC” treatments increased number offlowers per inflorescence. However, ”SADH” and shoot topping teatments surpassed ”CCC” treatments in their effects. 3— EFFECT OF SADH ON FLOWER BUD DEVELOPMENTThe course of flower bud initiation and differentiation passed through eight distinct stages through the period of April, 22nd, 1989 till March, 1st. 1990. The stages are namely: dome shaped apex ”vegetative or neutral (I), flattening of the apex and inflorescence primordium (II), sepals primordia (III), petals primordia (IV), stamens primordia (V), carpels primordia (VI), full development of floral parts (VII) and differentiation of ovules and pollen grains (VIII).”SADH” sprays greatly affected flower bud initiation and differentiation. Since, ”SADH” treatments acclerated earlier development of stage II by two weeks. Moreover, buds of 2000 and 3000 PPm-srayed trees completed their differentiation and burst into flowers in August, 1st. Baside, buds of 1000 PPm--SADH” sprayed trees completed their course of development and burst into flowers in mid-August compared with those of unsprayed trees which completed their differentiation (stage VIII) in early April of the following year. 4— TREE FRUITINGa-All treatments increased fr/ut set percentage as compared with the control. 2000 and 3000 ppm treatments caused the highest increase in fruit set percentage followed by 2000 ppm and shoot topping treatments.b-Fruit DROPping perecentage was high during the early stage of fruit life (Late April-early May) and it

decreased as fruit age advanced. All treatments decreased fruit DROPpingespecially during the early stage of fruit life. ”SADH- and ”CCC” treatments surpassed shoot topping treatment in this respect. Significant differences between the growth regulators or its concentrations were lacking.c-All treatments increased yield as kg.per tree as compared with the control. 2000 and 3000 ppm ”SADH” were the most effective treatments followed by the same concentrations of CCC. The low cencentrations of CCC and SADH and shoot topping treatment had similar effect on tree yield.d-Shoot topping as well as ”SADH” and ”CCC” treatments increased number of fruits per tree. The high concentration of CCC was the most effective treatment throughout the course of study.e-Number of fruits per inflorescence of treated trees was higher than those of the control. Moderate and high concentrations of ”SADH” and ”CCC” were the most effective treatments.f-Growth regulators treatments (CCC & SADH) and shoot topping treatment increased the yield as kg. per cm2 of trunk cross-sectional area-SADH and CCC treatments were the most effective treatments and exerted statistically similar effects. 5— FRUIT QUALITYI— Friut physical propertiesa- Shoot topping and low concentrations of ”SADH” and ”CCC” increased fruit weight. The moderate and high concentrations of ”SADH” and ”CCC” were the least effective treatments.b-Shoot topped trees and 3000 ppm CCC-sprayed trees gave longer fruits than those of the control. Meanwhile, 2000 and 3000 ppm SADH took the other way around. c-2000 and 3000 ppm CCC treatments decreased the fruit diameter as compared with untreated trees or shoot topped ones. The reverse was true with SADH treatments.d-All treatments increased number of viable seeds per fruit as comppared with those of the control.e-Shoot topping as well as moderate and high concentrotions of ”SADH” and ”CCC” gave more firm fruits.II— Fruit ca.1 prcopertiesa-All treatments increased the percetage of total soluble solids ”CCC” treatments and 1000 ppm SADH were the most effective treatments in this respect.b-Shoot topping and growth regulators treatments greatly decreased fruit acidity 2000 ppm CCC was the most pronounced treatment.c-Starch and total sugars percentages were greatly decreased as a result of different treatments. ”SADH” and ”CCC” treatments surpassed shoot topping in this respect. Significantdifferences between growth regulators used or its concentrations were lacking.from the previous results and under similar conditions of this study, it could be concluded that spraying ”Le Conte” pear trees with 2000 or 3000 ppm Alar or Cycocel improved flowering and fruiting of these trees. However, shoot topping in mid-June was promising in improving flowering, fruiting and fruit quality of ”Le Conte” pear without inducing any residual effect on the trees or the environment. In the meantime, such response could be obtained at a lower cost than Alar or Cycocel treatments.