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Many deciduous fruit trees are physiologically adapted to cold winter. They shed their leaves as winter approaches and enter a dormant state in which they are resistant to frost. Dormancy is broken, with the emergence of leaves and flowers, when temperature rise in spring, but only if the buds have experienced a period of low temperature. The amount of chilling required for bud break is specific and associated with cultivars. Apple is one of the most important fruit crop in the world. A major problem of the cultivation of apples in tropical and subtropical conditions is the lack of sufficient cooling hours to permit more and uniform bud break after dormancy. Introducing of the different apple cvs to Egypt had been achieved recently by the Ministry of Agriculture. Most of these varieties had been failed under the Egyptian condition due to their high need of chilling requirements, which is not available under our country conditions. In the last decade, some cultivars accepted to be suitable for mild winter countries, such as Anna, Ein-Shemer and Dorset Golden, had also been introduced and widely cultivated in Egypt. Anna apple cv. which derived from the cross between Golden Delicious and Red Hadassiya apple cvs., has a good fruit quality and the important one of all introduced cultivars as recommended by Stino and El Fakharani (1985). Although, Anna require relatively a small amount of chilling for breaking bud dormancy, but it also suffer from inconsistent bud break, flowering and delayed cropping in such Egypt conditions (Stino, 1997) specially in the middle Egypt. Since, more than 50% of Anna apple tree buds keep in a dormant phase under Minia governorate conditions (Morsy, 1993). The main problem resulting from inadequate winter chilling and hot dry summer is abnormal plant growth generally referred by serious
phenomena such as delayed and prolonged flowering, insufficient blossom synchronisation between cultivars and pollinators, delayed foliation, insufficient foliage due to poor bud break and weakness the vegetative growth as well as poor in both quantity and quality of the fruit yield. However, chilling is not an absolute requirement for bud break. Since, rest can be broken under certain conditions by using some artificial means such as anaerobic conditions (Erez et al. 1980), hot water (Shulman et al. 1983), bud scale removal (Mizutani et al. 1995) and various chemicals including ethylene chlorohydrin (Lin et al. 1983); mineral oils (Erez, 1987); DNOC (Diaz et al. 1987); potassium nitrate ((George and Nissen, 1988); thiourea (Shikhamany and Reddy, 1989); sodium azide (Nir and Lavee, 1993); thidiazuron (Ragab, 1996); calcium cyanamide (Mizutani et al. 1995) and urea & zinc sulphate (Wassel et al. 1996). Dormex (49% hydrogen cyanamide) which has been developed by SKW Trostberg AG, Germany, has replaced most of these chemicals and widely used as a dormancy breaking agent. This bud breaking regulator, potent in regions with a warm winter, has often a significant effect also in cooler regions (Lavee, 1990) little is known about the mode of action and the effect of the effect of these rest breaking agents on fruit tree physiology. Since, the responses from the application of chemicals are often inconstant between species, cultivars and regions. However, the efficacy of these chemicals appears to depend on rates of chemical applied, time and method of application as well as the prevailing climatic conditions in the treated area specially during and after application.

This investigation was carried out to compare the effect of different concentrations of Dormex, thidiazuron, mineral oil and urea on floral bud break, fruit set, harvest date, yield and fruit quality of "Anna" apple trees. Also, the endogenous hormones level of "Anna"