found in the organic acid fraction when $^{14}CO_2$ was presented to the cluster indicates that fixation of carbon dioxide into malic acid may make important contributions to the acid content of the berry.

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Floral Initiation of *Xanthium* in Response to Application of an Extract from a Day-Neutral Plant

A procedure for the preparation of a floral initiating extract from the leaf tissues of *Xanthium strumarium* has been described in an earlier report[1]. In general, the procedure involves the rapid freezing in liquid nitrogen of fresh leaf material obtained from flowering *Xanthium* plants. The frozen tissue is lyophilized at temperatures below 0° C. In recent work the continuous extraction procedure has been modified and extraction of the dry leaf material is now accomplished by several washings with cold (0–10° C.) absolute methanol. The methanol is removed at a low temperature by evaporation at reduced pressure in a Rinco apparatus. The residue is diluted with 1·5–5 times its weight of lanolin and the mixture applied as a coating to the under surface of the leaves of vegetative *Xanthium* test plants. All treated plants and their corresponding controls are maintained until dissection on strict long-day conditions. Three weeks after treatment the plants are dissected and the extent and degree of flowering is recorded according to a standard procedure[2].

In the intervening year since the original work was reported we have repeatedly demonstrated the activity of the extract in causing initiation of flowers in *Xanthium*. Recently we have found the extract capable of causing floral initiation in *Xanthium* under conditions of continuous illumination of approximately 2,000 foot-candles intensity from a fluorescent light source. In a typical experiment 40 per cent of the treated plants flowered with all the untreated control plants remaining vegetative.

Extracts prepared from the indigenous sunflower *Helianthus annuus*, a day-neutral plant, also have been found capable of initiating flowering in *Xanthium* test plants. Leaves from flowering *Helianthus* were picked in the late summer of 1961 and were processed and extracted in accordance with the previously described method for obtaining *Xanthium* extract. In one of several successful experiments, 200 g of lyophilized *Helianthus* leaf material yielded 34 g of extract residue. The residue was blended with 50 g of anhydrous lanolin and applied to the leaves of 40 vegetative *Xanthium* plants. A group of 40 untreated plants was used as controls. All plants were then maintained on long-day conditions of 18 h of light and 6 h darkness at 25° C. for the subsequent three weeks. The plants were then dissected. All the control plants were vegetative. Twenty per cent of the treated plants flowered; of those flowering the average floral stage[2] at the time of dissection was 1·2.

The initiation of floral development in *Xanthium* in response to application of *Helianthus* extract strengthens the belief that there is a common chemical substance or closely related series of chemical substances governing the transition to flowering in many plants. Although the evidence is as yet incomplete, the active entity in the extracts is presumed to be the flowering hormone, florigen.

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Bud Rot Disease of the Oil Palm

For many years, a pathological condition of the oil palm, *Elaeis guineensis*, in which the spear and bud tissue becomes rotten, has been known, and has been reported from many countries where the palm is in cultivation. In general, the disease is occasional, but in some areas the incidence is high, and it has caused the death of a large number of palms in the plantations in South Congo.

Numerous possible agents have been suggested as causal, but in spite of many attempts at diagnosis, no one has succeeded in reproducing the condition.

The disease has now been shown to be due to a bacterium of the genus *Erwinia* and similar to *E. lathyri* (Manns and Taubenhaus) Holland, but only on palms which have become, or have been made, susceptible.

Continuous growth studies made on a group of palms in the geneological block at Branbanta (South Congo), show that before an attack of bud rot takes place, the growth-rate of the palm slows considerably. Natural rotting commences some three weeks after this in the region below the point of visible emergence of the spears through the funnel formed by the older leaf bases. If, however, the palm is inoculated immediately a slowing of growth is apparent, an attack can be started within two or three days. Rotting has also been induced by inoculation on palms which have remained for long periods on, or just above, the apparent threshold of susceptibility without succumbing to natural attack. Palms maintaining a normal growth-rate, that is, vigorous palms, have been inoculated, but invariably without effect.

Healthy palms can be made susceptible, and attacks of bud rot have been produced by both root and leaf cutting. A tourniquet applied low on a young spear renders that spear susceptible, but only above the tourniquet.