

## INTRODUCTION

Apple fruits (*Malus sp.*) have great economical, commercial, and nutritional importance. The calculated net return from apple growing is very high in relation to other fruit crops. For instance, net return from Anna apple orchard under Egyptian conditions for 8 successive years reached 10.34, while Peach was 6.42 and 2.16 Egyptian pounds for Navel orange (Stino, 1987). In addition, the success in producing high yield with a pleasant fruit quality of Anna and Ein-Sharnir apple cultivars in A.R.E. encouraged the unlimited demand as well as increased horizontal extension of these cultivars. Thus, total cultivated area of apple (according to the latest agricultural statistics, 1997\*) reached 74004 feddans. From this area 59156 Feddans have bearing trees produced 412321 metric tons. More than 72% of the total area are concentrated in newly reclaimed soils in which agricultural labors were rarely available.

On this concern, different soil management systems are practiced in apple orchards for controlling weeds. Clean cultivation is one of these systems, which is commonly used but has a detrimental effect on hairy roots and soil organic matter content beside, its high expenses. Thus, herbicides application were used as alternative tool but the residual effect and high costs of these materials forced apple growers to use another practice i.e. mulch treatments without any health hazard. In deed, mulch has many advantages since it increases soil organic matter content and allow roots to penetrate in the soil (Marks, 1993). Moreover, it eliminates

---

\* Agricultural Economic reports (1997), Ministry of Agriculture, Dokki , Giza

the residual effect of the herbicides. On this concern, different sources of mulch are used. Rice straw is one of these sources commonly used in the orchard but it is recently consumed, after some modifications, as food for agricultural animals in the farm as well as in paper manufacturing ...etc.

Thus, using of field crop residues beside rice straw as mulch materials. Fruit growers accustomed to consider field crop residues as wastes.

Anyhow, the aims of this investigation are to study the effect of different soil management systems: clean cultivation, different herbicides and different mulch sources on weeds control in apple orchard besides tree responses regarding growth, fruiting and fruit quality of bearing Anna apple trees. Also, microbiological studies were done on mulch materials in this work to throw some light on the rate of decomposition of these materials to determine the best time for adding these materials to trees. Moreover, a study on herbicide residues in the fruits was adopted as an introduction to a several studies in the future in this field.

