I. INTRODUCTION

In most areas of the USA, other than California, only supplemental irrigation, if any, is used in commercial strawberry (Fragaria sp.) production. More rainfall is encountered in these areas, and the harvest season is short with low production in comparison with California. Strawberries are produced in California and shipped to local and eastern markets for 10 months out of the year. When strawberry plants are required to produce intensively over such a long period, optimum soil water levels are constantly required. Any water stress during the year reduces the total crop and fruit size, and these losses cannot be recovered. This is especially true when an annual planting system is used.

Experiments in areas other than California (Bell and Dawnes, 1961; Fortier, 1961; Simons, 1958, 1961; Newburg, 1960) have consistently shown that supplemental irrigation is advantageous. This is true if the plants are irrigated only during establishment and harvest, as well as when they are irrigated according to need throughout the season. Optimum soil water level during fruit bud formation is shown to increase the number of fruit bud set during fall months (Naumann, 1964; Rom and Dana, 1962). Irrigation during harvest increased total production and fruit size (Simons, 1958, 1961).

II. PLANT CHARACTERISTICS

The strawberry plant is shallow rooted, with 80% to 90% of the roots in the top 12 inches, but some roots penetrate 2 ft or more (Nielsen and Wilhelm, 1957). When daughter plants are set in the field, the first roots produced are laterals from the original roots. As the plant becomes established, the crown enlarges and multiplies, and adventitious roots arise at the base of the crowns directly above the original root system. In order for the newly initiated roots to penetrate the soil, adequate water and satisfactory soil conditions are necessary. Thus, upon enlargement of the root system more crown growth can be subsequently supported. With the matted-row cultural system, moist soil is also necessary in the surface inch to permit runner plants to set and establish themselves as soon as possible so that the daughter plants can make optimum growth.