Nursery plants are characterized by different crop potentials, which can be evaluated by the detection of inflorescence number and position, while earliness and synchronicity of production can be estimated by observing the developmental stages of the flowers.

In order to base the plant quality evaluation on crop potential, information about the number and position of the inflorescences must be taken into account, along with their developmental phase and the number of differentiated flowers, as the number of differentiated flowers is positively correlated to the final number of fruits (Jemmali and Boxus, 1993; Savini, 2003).

The developmental phase of the inflorescences and their differentiation are also important factors when evaluating the optimal digging time of the plants, especially for programmed production plants that will be cold stored and must have completed the differentiation process.

7.5. Plant Manipulation in the Field

Different plants have specific management needs and a higher or lower ability to produce fruits in different growing contexts. The growing technique is related not only to the plant type and size, but also according to the year of plant production and to origin (nursery), which can all affect the crop load (Faby, 1997). Knowledge about the plant quality (crop potential, plant architecture) allows planning of the planting date and density, the forcing technique and fertilization, allowing manipulation of the plant to obtain satisfactory production results.

The response of the plant to environmental signals, such temperature, varies depending on the physiological phase of the different organs and their relative positions. The date of forcing may significantly modify the plant architecture. For instance, axillary meristems at a maximum level of dormancy do not develop secondary shoots after placing the plants in the greenhouse (Bosc *et al.*, 2012). As the chilling requirement is increasingly satisfied, the axillary meristems initiate new secondary shoots, but if the temperature is too cold (delayed forcing after the end of October), lateral growth can be penalized (Savini *et al.*, 2006b).

Flower removal may promote the production of leaves (Daugaard, 1999) and runners (Scott and Marth, 1953; Robertson and Wood, 1954; Moore and Scott, 1965) in some genotypes. In other cultivars, deblossoming treatment increases runner production only in combination with defoliation, or may have no effect on runner formation (Waithaka, 1993). The removal of runners promotes branch crown development (Hancock, 1999). Transplant defoliation may affect plant growth, reducing the number of crowns and inflorescences (Chandler *et al.*, 1988; Kerkhoff *et al.*, 1988; Albregts *et al.*, 1992; Mohamed, 2002) if there is not enough time to restore the leaf surface area.

Late summer planting may reduce the crop potential, but later planting can also increase the number of flowers and inflorescences in autumn production systems (Palha *et al.*, 2012). Late autumn transplanting reduces the number of crowns, but other factors influence the total yield, affecting the fruit size (Hassell *et al.*, 2007). In remontant cultivars, the number of crowns increases by advancing the planting date and prolonging the growing period, enabling a higher yield if the cultivar is not highly crowned (Ruan *et al.*, 2011), as the inflorescences derive from the apical meristems of the plant. For delayed transplanting in the field, when environmental conditions promoting flower differentiation do not persist, it is necessary to select already differentiated plants from the nursery. For a good crop, planting density can be balanced according to the number of inflorescences per plant (flowers m^{-2}) rather than the plant size, as the former is more strongly related to the crop potential.

Small-sized plants with a few flower buds in addition to the terminal one produce a short harvest season provided by a sequence of fruits ripening inside the terminal inflorescence itself over 1 month and a possible later small production of fruits from the axillary buds. This type of plant is profitable only with high-density planting, mainly in mild climates where the plants can differentiate further flowers on the top of the lateral shoots after the first harvest.

Increasing plant density (by reducing either row or plant spacing) may reduce the crown diameter and early and total yield, with no effects on the number of leaves (Paranjpe *et al.*, 2008). At a low planting density, a higher yield is possible.

Well-differentiated plants, with the terminal inflorescence at a late developmental stage and with many less-developed lateral shoots and buds, start producing from the terminal inflorescence around 40 days after transplanting and continue producing from the other inflorescences before the end of the first production.

When plants bear vampire buds (flower-differentiated buds at the same stage as the main terminal apex) at the base of the crown, these buds can compete with the terminal inflorescence. It is useful to be aware of their presence in order to plan their removal or to adjust the growing technique, allowing a good harvest. The ability of axillary buds to grow out is related to the degree of apical dominance (Sugiyama *et al.*, 2004).

7.6. Architecture Analysis Techniques

Strawberry plants are composed of a short axis (crown) with very close nodes and leaves (rosette), ending with an inflorescence. The plant architecture facilitates the representation of the topology of the vegetative and reproductive organs along the short axis to produce a schematic model of growth (Guttridge, 1955; Savini *et al.*, 2005). Such an analysis of plant architecture detects and records the fate of all the meristems and scores the developmental stages of flower organs. The organization of the plant derives from sequential morphological processes due to the activity of the meristems, and therefore the identity and position of the buds is very important to determine the architecture of the plant. The description of the plant is based on breaking it down into elementary repeating units and on their characterization. The elementary unit of the plant structure is the phytomer, a particular type of segment of the shoot (metamer) (White, 1979), composed of one node with the subtending leaf and internode and one or more buds in the axil of the leaf.

The analysis consists of dissection of the plant, removing each leaf starting from the base of the crown, and identification of all the structures inserted in the axillary position of each node. The sequence position of the nodes can be recognized because each leaf envelops the subsequent internal leaf overlapping the stipules. The characterization proceeds in three steps, starting from identification of the plant elements (meristem fate and leaf characterization).

Leaves are characterized according to the presence of developed and living blades. Bud fates can be classified into main categories, depending on the development into a branch (side crown) or runner (long vegetative shoot), on the condition of the dormant axillary bud, and on the failure or abortion of the meristem (blind node). The fate of the terminal position of the branches and of the apical meristem inside the buds must be also identified as reproductive or vegetative in order to describe the position of the reproductive structures. Buds are enveloped and protected by modified stipules that must be opened using a scalpel and forceps, through a longitudinal and a transversal cut. The internal layers of leaf primordia are counted and removed, turning them outwards in order to expose and observe the meristematic apex under a stereomicroscope at an optimal magnification of ×40. The leaf primordia are also composed of blades and stipules enveloping the smaller primordia. In the second step, for each flower-differentiated apex, the differentiation phase must be scored according to a conventional developmental scale (Fig. 7.1) (Taylor, 2002; Savini, 2003) based on the centripetal appearance of the reproductive organs (sepals, petals, stamens, receptacle) on the primary flower of the inflorescence. The first stage (stage 0) of the scale indicates the vegetative condition of the meristem, underlying the stipules of the least developing leaf layer. At stage 1, a rising dome is