ABSTRACT: Plant support devices are provided in the form of a multiflanged tubular member having apertures in the flanges to receive tie means, such as string or rope. One end of the device is conical and the flanges are beveled to facilitate driving it in the ground. Apertures are provided in the conical end to permit liquid placed in the tubular section to drain slowly outward into the ground adjacent plant roots. An elaborate support system such as for vines may be provided by connecting a plurality of such devices together with tubular branch connectors. Modifications include outlet openings along the length of horizontal tubes to permit spray patterns of liquid introduced through a branch of one of the branch connectors. Various other modifications are also provided.
SUPPORT FOR GROWING PLANTS

This invention relates to plant support devices and it is more particularly concerned with the provision of means which can be used to hold plants, such as tomato and bean plants, various vines and flowers, in upright position.

An object of the invention is the provision of a plant stake which is resistive to bending in different directions.

Another object is the provision of a plant stake which can be used to water plants in different ways and which may also be used to apply liquid nutrients and insecticides.

A further object is the provision of connectors which can be used with such stakes to form different plant support structures.

These and still further objects and advantages of the invention will appear from the following description considered together with the accompanying drawing.

In the drawings:

FIG. 1 is an elevational view of an embodiment of this invention partly broken away, imbedded in the ground to support an adjacent plant.

FIG. 2 is a cross-sectional view along the line 2-2 of FIG. 1.

FIG. 3 is a cross-sectional view along the line 3-3 of FIG. 1.

FIG. 4 is a cross-sectional view along the line 4-4 of FIG. 1.

FIG. 5 is a perspective view of a structure comprising various features of the invention.

FIG. 6 is a separate perspective view of a member, partly broken away, comprising the structure of FIG. 5.

FIGS. 7, 8, 9 and 14 are perspective views of different tubular branch connectors.

FIG. 10 is a sectional view along the line 10-10 of FIG. 5.

FIG. 11 is a longitudinal sectional view along the line 11-11 of FIG. 1.

FIG. 12 is a perspective view of a fragmentary portion of a modification of the structure shown in FIG. 5.

FIG. 13 is a cross-sectional view along the line 13-13 of FIG. 2.

FIG. 15 is a perspective view of a modified form of one element of the invention illustrating means for extending its length.

FIG. 16 is a sectional view along the line 16-16 of FIG. 15.

FIG. 17 is a perspective view of the connector of FIG. 15.

FIG. 18 is a perspective view of a lower portion of the element of FIG. 15 illustrating a further modification thereof.

Referring with more particularity to the drawings in which like numerals designate like parts, the embodiment illustrated comprises a stake in the form of an elongated tube 11 having a closed conical end 12 and having longitudinally extending flanges 13 on the exterior. These flanges reinforce the stake to resist bending in different directions by wind or colliding objects. On one end, the flanges are beveled as at 14 in alignment with the surface of the conical end 12 to facilitate driving the stake in the ground 15. The flanges 13 are provided with longitudinal rows of apertures 16 for holding a rope or string 17 tied to an adjacent plant 18.

A small slit 19 may be provided as an extension of some or all apertures 16 to act as a detent for a knot 20 of such a string or rope providing different means of attaching the rope or string to and detaching it from the stake. Alternatively, hooks 21 may be struck from one or more of the flanges 13.

By placing such a stake in the ground and filling the tube 11 with water 22 or a liquid plant nutrient, a gradual absorption takes place in the ground through apertures 23 at the bottom of the tube in the vicinity of the plant roots.

Where a more elaborate plant support structure is necessary, such as, for vines, a group of such stakes may be set in the ground at intervals and connected at their upper ends by means of struts 24 having one or more longitudinal flanges 25. The struts 24 may comprise an elongated tube 26 open at either end to receive tubular branch connectors at their open ends. These connectors may be of various shapes including a T-shaped connector 27, a four-way connector 28, a five-way connector 29, or other multiple branch connectors. The ends of the tubes 26 are recessed to receive plastic liners 30 which permit a tight seal with the ends of the tubular connector branches that are adapted to be inserted therein.

Continuous irrigation may be provided by attaching a water hose 31 to a branch of a connector on top of a stake whereby water or an aqueous insecticide or nutrient solution is delivered through perforations of the tubes. For example, flanged tubular sections 34 may be connected by a tubular connector 35 in horizontal positions to solid stakes 36, that is, stakes having flanges 37 without a tube 11, for overhead watering or spraying of liquid insecticides or nutrients. The tubular sections 34 are provided with perforations 38 to permit the escape of the liquid in a spray pattern along its length. The stakes 36 may be connected by their flanges 37 to flanges 32 of the tubular sections 34 by means of conventional bolts 44.

Additional ground support may be provided by pivotally attaching legs 39 to the flanges 37 (see FIG. 18) which extend outwardly thereby permitting the outer ends to be firmly imbedded in the ground or engaged therewith.

To extend the height of a stake 36, a connector 40 may be provided in the form of a solid cylinder having slits 41 at the bottom to fit over the top end of a flanged stake 36 and similar slits 42 at the top to fit the bottom end of an extension member 43. (See FIGS. 15, 16 and 17.)

The flanges 13 are provided with end ribs 45 and 46 for added strength in resisting torsional stresses. With such an arrangement annular bosses 47 are provided around the bolt holes of the flanges 25 to fit the space between the ribs 45 and 46 and thereby to provide relative rotational movement in order to maintain the stakes in a vertical position in irregular terrain.

Ribs (not shown) similar to the ribs 45 and 46 may, if desired, be provided on the flanges 37.

I claim:

1. A plant support comprising a longitudinal tubular section, longitudinal flanges integral with and extending substantially the length of the said tubular section, said flanges extending radially outward from the exterior surface of the tubular section, said flanges being tapered to a common point at one end of the tubular section, a portion of the tubular section at said end being a continuation of the taper of the flanges to provide a lower support end to be driven into the ground, said portion having apertures for the discharge of liquid from the interior tubular member, said flanges having means for engaging filamental support members.

2. A plant support as defined by claim 1 in which a group of four flanges are provided equally spaced circumferentially.

3. A plant support as defined by claim 1 in which the flanges are provided with apertures for the reception of filamental supports.

4. A plant support as defined by claim 3 in which the flanges contain slits continuous with and extending from the apertures.

5. A plant support as defined by claim 1 in which the flanges are provided with hook members for engaging a filamental object.

6. A plant support as defined by claim 1 and a tubular connector having a plurality of branches, one branch being connected to the upper end of the tubular section.

7. A plant support as defined by claim 6 in which the tubular connector is angular.

8. A plant support as defined by claim 6 in which the tubular connector is T-shaped.

9. A plant support as defined by claim 6 in which the end of the tubular section contains a plastic liner for frictional engagement with a branch of the tubular connector.

10. A plant support as defined by claim 1 in which reinforcing longitudinal ribs are disposed at the ends of the flanges.

11. A plant support comprising sections of vertical ground members having each a plurality of longitudinal flanges extending radially from a common central axis, said sections being joined together by connectors, said connectors comprising a solid member having slits at the top and bottom to receive and frictionally engage adjacent corresponding ends of the sections.
12. A plant support as defined by claim 11 and legs connected to the flanges of the stake and extending outwardly therefrom to contact the ground in which the stake is imbedded.

13. A plant support as defined by claim 11 in which the flanges of the bottom and of the lowermost section are tapered to a common point to facilitate driving it in the ground.

14. A plant support comprising at least two longitudinal tubular sections, each section having longitudinal flanges integral with and extending substantially the length of the said tubular section, said flanges extending radially outward from the exterior surface of the tubular section, said flanges being tapered to a common point at one end of the tubular section, a portion of the tubular section at said end being a continuation of the taper of the flanges to provide a lower support end to be driven into the ground, a tubular horizontal member between the tops of said sections, said horizontal member having a perforated flange extending outwardly and substantially the length of the member, means connecting the ends of the horizontal member with the upper ends of the tubular sections, respectively, the perforations of said flange being adapted for the reception of filamental elements.

15. A plant support as defined by claim 14 in which the horizontal tubular member is provided with apertures for the escape of liquid from the interior.