

Aerial Crowns in *Asparagus officinalis* L.¹

Hsu-Jen Yang and W. J. Clore²

Washington State University,

Irrigated Agriculture Research and Extension Center, Prosser

of parent plants or were separated artificially to form new plants (Fig. 1, H).

Asparagus is generally propagated by seed and occasionally by crown division. Crowns are usually formed underground at the base of stem (1, 2, 3, 4). To our knowledge, the formation of crowns at above-ground nodes and plant development therefrom has never been reported. Occurrence of such crowns opens the way to a rapid means of vegetative propagation. Here we describe the morphology of aerial crown formation and subsequent development of these crowns into apparently normal plants.

Seedlings of the University of California (UC) selection 'UC 66' and tissue culture plantlets of 'UC 500W' and 'UC 77', placed in a mixture of 2 parts sandy loam : 1 part peat : 1 part sand in unglazed pots, were held at 27 ± 1°C in a greenhouse having a daily photoperiod of 16 hr under fluorescent light. Moisture in the pots was maintained at a relatively high level by watering daily.

After stem growth ceased, an unusual development of buds at nodes on the basal portion of some stems was observed on seedlings and tissue culture plantlets. At first, a gradual swelling of the bud occurred at a node with or without a branch. When this bud was 2 to 3 mm in length and 2 mm in diam, additional buds formed beside it (Fig. 1, A-E). The formation of new buds continued more or less indefinitely. Eventually, an enlarged aerial crown-like structure was formed (Fig. 1, F-G). As the aerial crowns developed in size and weight, the stems bent until the aerial crowns touched the ground. During the forming of this tissue, shoots and roots

developed from each of the aerial crowns (Fig. 1, F). After the roots were well developed and were serving as an anchor for their shoots, aerial crowns detached naturally from the stem nodes

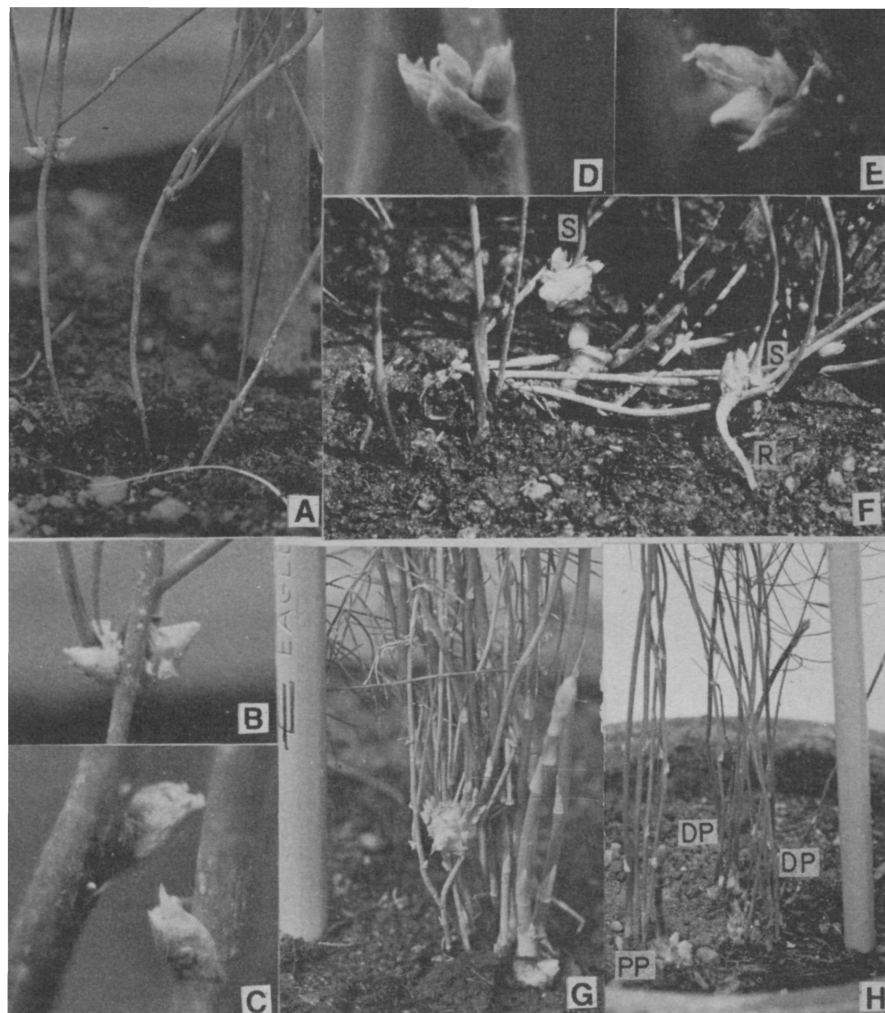


Fig. 1. Aerial crown development in asparagus. (A) Buds formed at the node with branches on the basal portion of asparagus stem. (B) Enlarged buds of A. (C) Two buds at nodes without branch. (D, E) Three buds inside the scale at node. (F) Shoots (S) and roots (R) developed from aerial crowns. (G) A large aerial crown developed on stem. (H) Two newly developed plants (DP) to the right of parent plant (PP).

¹Received for publication October 30, 1972. Scientific Paper No. 3951. Washington State University, College of Agriculture, Research Center, Project No. 1621.

²Research Associate and Horticulturist, Department of Horticulture, respectively.

Diurnal Variation in the Nitrate Concentration of Beets¹

P. L. Minotti and D. L. Stankey²

Cornell University, Ithaca, New York

¹Received for publication June 30, 1972. Paper No. 644, Department of Vegetable Crops, New York State College of Agriculture and Life Sciences. This research was supported in part by Hatch Regional Research Funds as a contributing project to NE-39, "Factors affecting the accumulation of nitrates in soil, water, and plants."

²Associate Professor and Graduate Student, respectively, Department of Vegetable Crops.

Abstract. A pattern of diurnal fluctuation in the nitrate concentration of young field grown beets (*Beta vulgaris* L.) was established. Plants assayed every 4 hours over a 52-hour period in late May showed greater than 2-fold differences with maximum concentrations at 4 AM and 8 AM and minimum concentrations at 4 PM. Thus, adjustments in harvest time may help minimize nitrate levels in vegetables. Moreover, diurnal fluctuations should be

taken into account when predicting the adequacy of soil nitrate levels by tissue analysis.

A consideration of environmental factors affecting nitrate reduction in plants, particularly light and temperature, and the extremes to which plants growing in the field may be exposed, led to the hypothesis that the nitrate content of such plants might vary appreciably over a period of a few hours. If so, adjustments in harvest time could help to minimize nitrate accumulation in crops where nitrate