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The Vegetative Growth Phases of Apple Shoots and Their Relation to Root Formation

V. T. Stoutemyer
Iowa State College

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THE STROPHIOLE IN SWEET CLOVER AND ALFALFA SEEDS

J. N. MARTIN

A microscopic study of mature seed coats and of the development of the seed coats of sweet clover and alfalfa, does not reveal a structure comparable to a strophiole. The seed coat is much arched and palisade layer doubled at the microphyle, but there are no openings in the palisade layer nor any excrescences or tubercles about the hilum.

At the margin of the hilum where the arching of the seed coat begins abruptly, resulting in a sharp curving of the seed coat, the palisade layer is apparently weaker and more easily broken than elsewhere. This was shown by the fact that in sectioning seeds through the hilum, the seed coat broke at the rim of the hilum much oftener than elsewhere.

DEPARTMENT OF BOTANY,
IOWA STATE COLLEGE,
AMES, IOWA.

THE VEGETATIVE GROWTH PHASES OF APPLE SHOOTS AND THEIR RELATION TO ROOT FORMATION

V. T. STOUTEMYER

Distinctly different growth phases in apple occurred during the course of development from seed to tree. The juvenile condition was recognized by the thinner leaves with much less pubescence. Anthocyanin production was more abundant in juvenile shoots. In some species of apple, the shape of the leaf changed from an entire to a lobed form with the approach of maturity.

Although the juvenile seedling form was transient, this type of growth could be reproduced in trees of any age by starting shoots from adventitious buds on root pieces. A method was devised to encourage the development of adventitious buds on roots. True adventitious buds on stems were found only very rarely. Water sprouts are not adventitious in origin but arise from buried buds.

Greenwood stem cuttings from shoots in the juvenile growth

phase were rooted very easily, but similar cuttings from shoots in the mature stage of growth could not be rooted by ordinary methods. The recognition of different phases of growth aids the interpretation of many of the results obtained by those experimenting with the vegetable propagation of the apple in the past.

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AMES, IOWA.

NOTES ON SEED PRODUCTION IN THE SMOOTH PERENNIAL SOW THISTLE (*SONCHUS ARVENSIS* VAR. *GLABRESCENS* WIMM. AND GRAEB.)

ADA HAYDEN

Sonchus arvensis var. *glabrescens* Wimm. and Graeb. is at present sparsely distributed in Iowa. The patches are often miles apart. In a number of isolated colonies observed in Clay, Palo Alto, Osceola, Dickinson, Story and Hamilton counties seeds are seldom or never found from July to September. Some tests made relative to the fruiting habits of the Smooth Sow Thistle produced the following results. Self or close pollinated flowers from the same head or from heads in the same colony produced no fruits ("seeds"). Flowers cross-pollinated by brushing with flowers from a distant colony produced almost as many seeds as there were flowers in the head. The heads average about 200 flowers each.

DEPARTMENT OF BOTANY,
IOWA STATE COLLEGE,
AMES, IOWA.