During the season of 1937 Dunbar and Anthony (2) noted what appeared to be definite cases of potash deficiency in certain peach orchards. This deficiency was manifested by the color and curling of the leaf and was apparently overcome quite rapidly by applying soluble potassium salts around affected trees. It seemed possible that, since many growers of both apples and peaches use little or no potash in their fertilizer, the lack of this element might be beginning to show deficiency symptoms and that other orchards showing no visible symptoms at present might be on the verge of a deficiency. With deep-rooted perennials like apples and peaches, a deficiency could exist without noticeably lowering the yield or wood growth and still gradually influence the vigor, longevity, and finally the yield.

It is realized that field comparisons with and without potash provide the best answer to the question and that such comparisons should be made over a considerable period of years to produce valid conclusions. Nevertheless, pending the initiation of such trials and to provide a better basis upon which to make field trials, the following soil studies were planned. These are in a sense preliminary and part of a more comprehensive program of study on the subject of soil potash availability.

The phases of study reported in this paper are as follows:
1. The relative amounts of exchangeable potassium in surface vs. subsoils in Pennsylvania orchards.
2. The relation between the amount of organic matter in orchard soils and exchangeable potassium.
3. A comparison between different soil series in regard to exchangeable potassium.
4. A comparison of rapid tests for exchangeable soil potassium with a routine procedure.
5. Foliage analysis as indicative of deficiency and response.

Forty-seven commercial orchards representing the major fruit sections of the state (Fig. 1) were examined and soil samples taken. Field notes included the type of soil, condition of tree, kind and amount of fertilizer, and lime and manure used, together with the cover cropping or other cultural system. Orchards were selected having high and low organic contents. Some received potash fertilizers, others none. In addition to samples taken in 1938 there were available the orchard soil samples taken by Shaulis and Merkle (9) in their study of the effects of orchard management practices upon the

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2Graduate Assistant in Soil Technology, Professor of Soil Technology and, Professor of Pomology, respectively. This work was done at the suggestion of R. D. Anthony by E. C. Dunkle under the direct supervision of F. G. Merkle.

3Figures in parenthesis refer to "Literature Cited", p. 457.