RESPONSE OF ROTENONE-BEARING DEVIL'S SHOESTRING, *TEPHROSIA VIRGINIANA* (L.) PERS., TO FERTILIZER APPLICATIONS

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The native legume, *Tephrosia virginiana* (L.) Pers., commonly known as devil's shoestring, is a possible source of a rotenone insecticide. The roots of this plant growing in certain localities contain rotenone and other rotenoids, but throughout most of its natural range the plant contains no such constituents or other traces of them. It is common in many sections of the eastern and southern states and is quite abundant in the Carrizo sands area of Texas, a belt of fine sand of the Norfolk series extending in a northeasterly direction from Dimmit County on the Mexican border to Cass County and thence into Arkansas. The individual plants with the highest insecticidal value found so far were located within this narrow belt.

In connection with an investigation of the possibilities of introducing this plant as a domestic crop for use as an insecticide, it was necessary to determine the effects of certain fertilizers on the plant. Its commercial value depends on the amount of rotenone and the rotenoids in the roots, and the returns to the grower depend on the yield of roots as well as on their quality. This paper reports the results of a replicated plot experiment made to determine the effect of certain fertilizers on the growth and toxicity of the roots of the cultivated plant at Wellborn, located in the Carrizo sand belt in Brazos County, Tex.

Wild plants known by test to contain appreciable amounts of rotenone in their roots were taken from Smith County, Tex., and transplanted into Norfolk fine sand at Wellborn. They constituted the stock which furnished the seed from which the plants used in the plot experiments were obtained to determine the effect of fertilizers on the growth rate and quality of the roots.

EXPERIMENTAL METHODS

In 1939, several hundred plants were grown in a nursery row, from seed of the above-mentioned plants. These 1-year-old seedlings, dug in the winter of 1939-40, constituted the planting stock used in the fertilizer experiments. The seedlings were thoroughly mixed before planting because the parent plants differed considerably in rotenone content.

Fertilizer treatments were arranged according to a complete randomized block design with four replications. The soil type, Norfolk fine sand, is very uni-