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UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Administration
Bureau of Plant Industry, Soils, and Agricultural Engineering
Division of Tobacco, Medicinal, and Special Crops

A Year-by-year Report on the
Chinese Thunder God Vine,
Tripterygium wilfordii
grown near College Station, Texas, 1943-1952

These plantings were made on a deep, infertile, Norfolk sand on the Royder Farm at Wellborn, Texas, some nine miles southwest of College Station, Texas. Reports from the various years were taken verbatim from the annual reports of the cooperative investigations on plant insecticides conducted jointly by the Division of Tobacco, Medicinal, and Special Crops, and the Texas Agricultural Experiment Station.

- 1943 -

May 8, 1943, received 155 stem cuttings and 29 rooted cuttings through A. F. Sievers. These were set at Wellborn, Texas, the same day, following a rain. Moisture was plentiful thereafter for three weeks, followed by drought.

Cuttings that were rooted had sprouted in the moss used as packing and these sprouts were about 2 inches long. The shipment was made from Bowie, Md., April 27, hence was 10 days enroute.

July 12. All of the above 155 cuttings dead. About 50 percent sent out top growth but this soon died off due probably to late setting and lack of moisture. No roots had formed on any cutting.

Of the 29 rooted cuttings, 8 are dead, the rest making but poor growth. An insect was eating leaves but the pest could not be found--may have been cut ants.

Nov. 15. Eighteen plants appear to have some life. The top growth has been slight.

Dec. 31. All plants examined at ground level and all appear to be dead. However, this is not positive and sprouts may appear in spring of 1944.

- 1944 -

Plants carried over from 1943, that appeared dead on Dec. 31 of that year, were examined on March 3, 1944 and 3 found putting out fresh growth, the remainder appeared dormant. Later in the month 7 other plants had new shoots. All tender growth was frosted on March 29-30, 1944. On July 10, 1944, the 10 plants that survived from 1943 setting were about 24 inches high, healthy in appearance. Some leaf margins were cut by an insect, same as in 1943. Insect not found.

On Jan. 12, 1944, 50 rooted cuttings (PI No. 113644) received and immediately heeled in sand in an unheated greenhouse. Condition on receipt appeared as good, none of the cuttings had sprouted. Warm weather the last of Feb. caused some of these cuttings to sprout, hence on March 2, 1944 all 50 were set in the field at Wellborn, Texas. Before setting, a fertilizer of 4-8-4 composition was placed under each plant. Soil very moist, day cloudy, followed by cloudy days with light rains.

On July 10, 1944 only 2 plants were alive, poor growth on one, fair growth on the other. Very little growth thereafter during the season. These 2 plants had no leaves cut by the insect mentioned above.

- 1945 -

Of the lot set March 2, 1944, only one plant alive on April 6, 1945. By May 15, this plant had made slight growth some leaves showed evidence of necrosis and some margins were cut by carpenter bees. On July 15 this plant had made some growth but not average. It did not grow much during the remainder of the season.

The lot set in 1943 grew better than the individual noted above. On April 6, 1945, nine plants were alive with an average top growth of 24 inches. These plants appear not too vigorous but are healthy. There appeared to be little root development since setting--estimated on April 20 as not over 50 percent. May 15 the top growth averaged from 24 to 40 inches and very few leaves had been cut by the carpenter bee. On May 22, two plants bloomed, small white blossoms in clusters about stem, heads about 6 inches in length. By July 15 these 9 plants had made an average top growth of 15 inches; 5 plants had bloomed but none set seed.

At present this species does not look promising as a crop for the type soil and region at Wellborn.

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- 1946 -

T. wilfordii is extremely hardy in the climate such as we have at Wellborn, Texas. It is deciduous, the leaves falling in early winter or late fall. The plant is a shrub in this section.

April 15. Top growth luxuriant with numerous new sprouts. Well leaved.

May 14. Plants have made 18 to 24 inches growth, spread 3 to 4.5 feet, height to extreme end of new growth 2 to 5 feet.

Blooming. May 29. New growth completed. Bloom in abundance. No seed collected, if any formed it was not noted.

- 1947 -

T. wilfordii flourished during 1947. It is a shrub in this locality hence does not grow much in height after the first two or three years but does spread out to a considerable extent.

Numerous bloom was observed but no seed was formed. The bloom comes on the last of May and flower heads were observed until the middle of June.

If this plant has any economic possibilities in this area it should be investigated intensively.

- 1948 -

Growth of this plant in 1948 was very good. The dry season did not affect growth. As usual numerous blooms came on early in the season (May) but no seed was formed.

Drs. Bishop and Haller of Bureau of Entomology and Plant Quarantine expressed the desire to have our Division grow a substantial amount of roots of T. wilfordii for careful examination. Nothing further was heard from BSEPQ, so no arrangements were made to expand the planting.

- 1949 -

The few plants growing at Wellborn survived the winter of 1948-49 and grew very well during the 1949 season. This plant-known as TWINDLER (GOD VINE) - does not exhibit vine-like characteristics except when the shoots from neighboring plants meet they twine about each other. Growth of shoots is whip-like and often exceeds six feet in length in one season. With age these shoots enlarge in diameter but do not greatly elongate. New shoots come from the crown each year and eventually the individual appears as a dense bush.

1949 (continued)

Cuttings of *T. wilfordii*.

An attempt to root wood cuttings failed. 480 cuttings, 4 to 6 inches long, were taken from one and two year old shoots, placed in a sand cutting bed and kept moist by frequent waterings. In about ten days buds burst and top growth soon became very abundant on most cuttings. Later on this top growth was cut back in an effort to induce callusing and root growth. Very little callusing was observed and only one or two cuttings made small roots before hot weather.

Addendum (from correspondence): On August 30, 1949 air dry samples of stems (278 grams of upper 1/3 of stems, 655 grams of middle 1/3 of stems and 1206 grams of lower 1/3 of stems) and of 1204 grams of leaves were sent to Mr. Sievers for transmittal to the Insecticide Division, BHPQ.

- 1950 -

See 1949 report. Old plants continued to grow satisfactorily at Wellborn. Attempts to root wood cuttings again failed. However, asexual propagation of this species does not seem impossible. During the winter of 1949-1950, a number of young shoots were bent down and sand was heaped over them. This attempt at layering may be successful since roots were formed on the layered shoots. These shoots will be separated from the parent plants and transplanted during February of 1951.

Addendum (from correspondence): On January 19, 1950, approximately five pounds of fresh small roots were obtained from these plants without destroying the plants. These were sent to Mr. Sievers for transmittal to the Insecticide Division, BHPQ.

- 1951 -

See 1950 and previous reports. The old plants in the nursery at Wellborn have gone into a decline. This may be attributed to the severe winter of 1950-1951, and to the fact that cut ants (for the first time) stripped the leaves during 1951. It seems rather surprising that ants should bother this species, because of its known toxic properties; perhaps the toxic properties are confined entirely to the roots. A number of rooted shoots, which resulted from the attempt at layering begun in the winter of 1949-1950 were separated from the parent plants and set in the nursery at Wellborn. At first it seemed that this attempt at asexual propagation would succeed since the cuttings put out leaves and began to make new growth. During the extremely hot dry summer they began to die one by one and by fall only a very few were still alive.

- 1952 -

Nine old plants remain in the nursery at Wellborn (one died after the 1951 decline). In the spring nearly all old top growth appeared dead, but new shoots arose from the crown; these made and sustained excellent growth all summer in spite of one of the most severe droughts on record. These plants averaged about 4.5 feet tall in late September with an average ground cover diameter of about eight feet; crown diameter averaged about one foot. New top growth made in 1952 seems about equal to growth accumulated up to 1951. No cut ant damage noted in 1952, perhaps due to better control of this insect. None of the rooted cuttings (which resulted from layering) set out in the spring of 1951 survived until the spring of 1952. A review of reports from the past years indicates that asexual propagation of this species at College Station, Texas, have always failed with the exception of the original rooted cuttings received from Beltsville. A possible explanation for this is the hot dry summers typical of this area.

Possibilities of Expanding Plantings at College Station, Texas:

The writer's opinion has been asked on the advisability of establishing a one-half to one acre planting of Tripterygium wilfordii at this location. There are a few matters to consider before any decision on this can be reached. Once established this species appears reasonably well adapted and hardy at this location; however, no estimate of the per acre yield of roots can be made at this location. Even digging the nine old plants now available would mean little or nothing from the yield standpoint, since it seems unlikely that any crop would be left so long before harvest. The major difficulty involved in a large scale planting here is the difficulty of establishing a stand. Field propagation of this species by asexual methods have been unsuccessful, and rooting of cuttings in the greenhouse may be impractical because of limited facilities. Even if rooted cuttings can be made available by one means or another, successful establishment would be entirely dependent upon adequate rainfall during the first growing season (no dependency can be placed in rainfall in this area). Such plantings might possibly be placed with cooperators in the southeastern states where rainfall is more dependable.

Before any attempt should be made to establish additional plantings of any kind, some assurance of continued interest and cooperation from personnel of the Bureau of Entomology and Plant Quarantine should be obtained. After a show of interest in 1948, no further interest was shown in expanded plantings here. Also no reports on composition of leaf and stem samples submitted in 1949 or root samples submitted in 1950 have been received at this field activity to date. Before going further into this matter it is suggested that this activity be furnished a complete file on chemical and insecticidal properties of Tripterygium wilfordii, as well as any other pertinent information.

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by Murray L. Rinman
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