

Without Cultivation in California, Calif. Agr. Exp. Sta. Bull. 637: 98, 1940), has never been recorded from Texas. It is represented in the Gray Herbarium however by three collections, all from NUECES Co.: Corpus Christi, *Dr. E. Palmer 2087*, Sept. 1879-Oct. 1880. Open ground near Bay, Corpus Christi, *E. J. Palmer 11213*, March 8, 1917. Corpus Christi, *H. C. Benke 5451*, April 4, 1930.

The True Clovers (*Trifolium*) of Texas

*Joe F. Hennen*¹

In Texas the true clovers do not represent a group of as much economic importance as the bur clovers (*Medicago*) and the sweet clovers (*Melilotus*). *Trifolium repens*, however, is widely grown in lawns and pastures. The native species, especially *T. amphianthum*, are of some value in pastures in the eastern half of the state. According to herbarium records, true clovers are lacking in the Panhandle and Southern Plains regions of Texas, and only one species is reported from the Trans-Pecos. It is likely, however, that introduced species do grow in these sections.

The key is based on obvious vegetative characteristics as far as possible, and secondarily on floral characters. Specimens studied are in the Herbarium of Southern Methodist University, and cited specimens are located there if not otherwise stated. Lists from the University of Texas Herbarium (determinations verified by Mr. Robert Van Vleet) and the Missouri Botanical Garden Herbarium (verified by Dr. L. H. Shinnars) were used in making distribution maps.

The flowering periods of the eastern species range from the latter part of March in south Texas to the early part of June in the north.

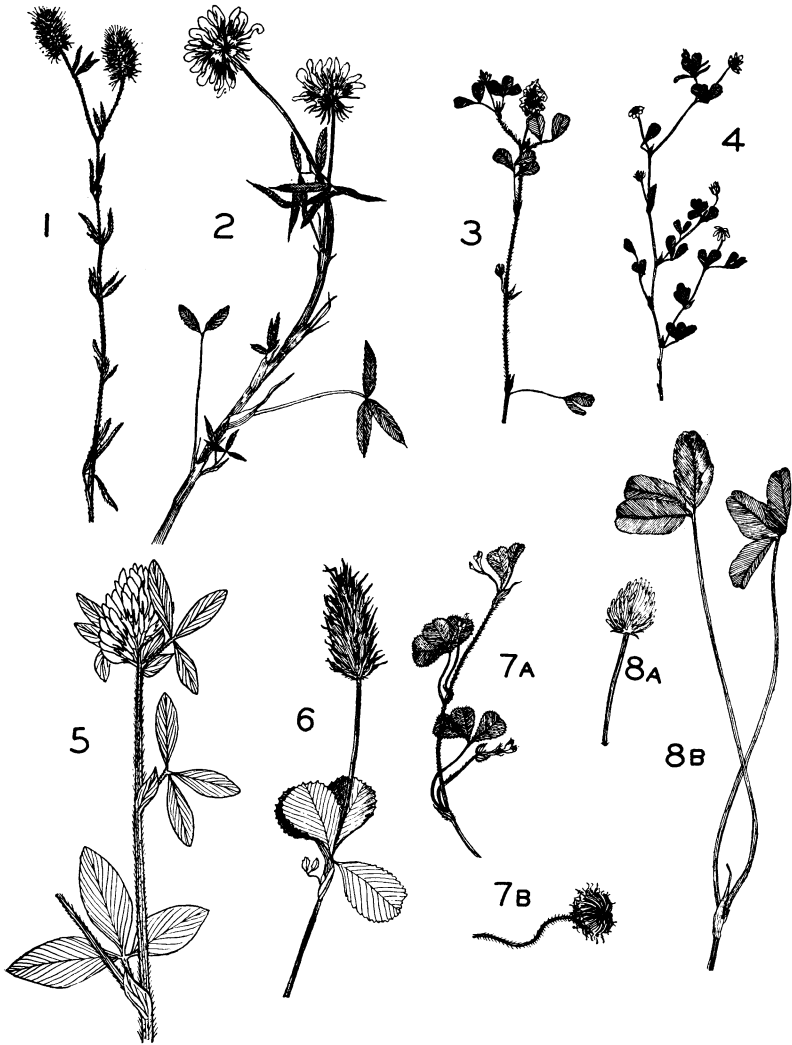
ARTIFICIAL KEY TO TEXAS SPECIES OF TRIFOLIUM

- 1a. Leaflets over three times as long as wide
 - 2a. Plant silky-pubescent; inflorescence villous, elongate, not subtended by bracts; introduced.....1. *T. arvense*
 - 2b. Plant glabrous or nearly so; inflorescence glabrous, globose, subtended by deeply divided involucreal bracts; native in Trans-Pecos.....2. *T. Wormskjoldii*

¹Formerly Student, Southern Methodist University; now Graduate Assistant in agricultural botany, Purdue University.

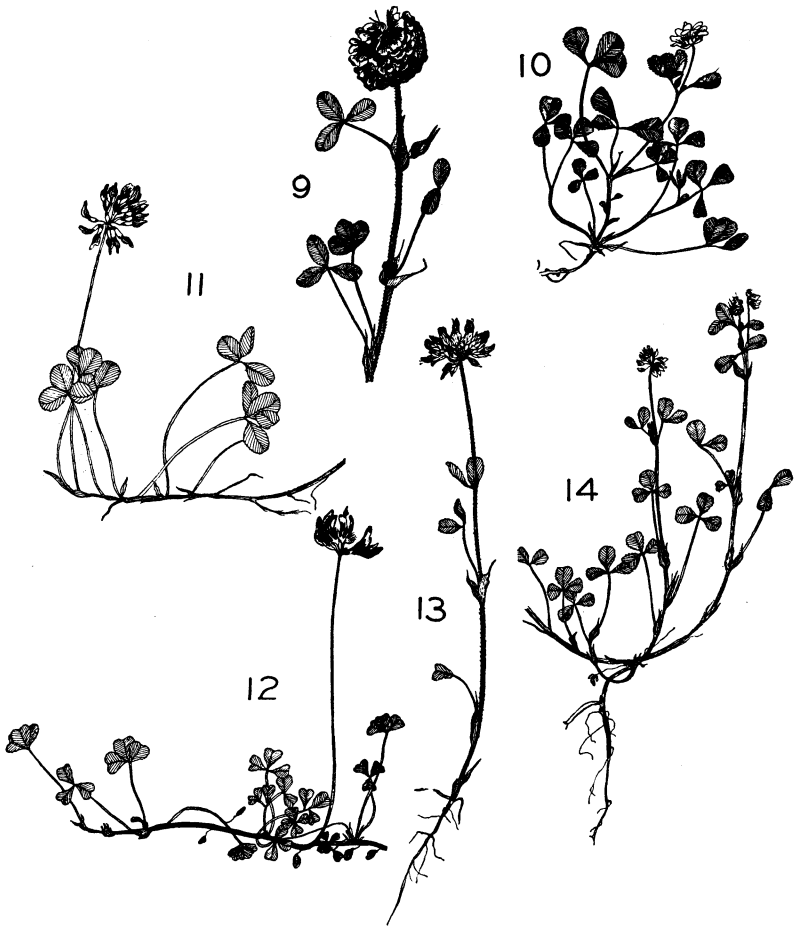
- 1b. Leaflets rarely over twice as long as wide, usually 1 to 1.5 times as long as wide
- 3a. Leaves pinnately trifoliolate (lateral leaflets sessile, terminal one stalked)
- 4a. Inflorescence 25-40-flowered, about 1 cm. long (except on dwarf plants).....3. *T. campestre*
- 4b. Inflorescence 9-18-flowered, usually about 0.5 cm. long
—4. *T. dubium*
- 3b. Leaves palmately trifoliolate (all leaflets sessile)
- 5a. Flower heads sessile or nearly so at the ends of main branches (peduncles less than 0.5 cm. long), subtended by large foliaceous stipules resembling involucre bracts
—5. *T. pratense*
- 5b. Flower heads on peduncles 1 cm. or more long; stipules present at base of peduncles, but not immediately under flowers and not resembling involucre bracts
- 6a. Inflorescence at least twice as long as wide, spike-like
—6. *T. incarnatum*
- 6b. Inflorescence usually about as long as wide, umbellate or capitate
- 7a. Inflorescence subtended by bracts
- 8a. Leaflets pilose over the surface; inflorescence developing into an underground bur.....7. *T. subterraneum*
- 8b. Leaflets pilose on the veins only; inflorescence not developing into an underground bur
—8. *T. fragiferum*
- 7b. Inflorescence not subtended by bracts
- 9a. Peduncles about as long as or a little longer than the petioles of the leaves which subtend them; inflorescence usually more than 2 cm. across
—9. *T. reflexum*
- 9b. Peduncles 2.5 times or more as long as the petioles of the leaves which subtend them; inflorescence usually not more than 2 cm. across.
- 10a. Florets sessile or nearly so; peduncles less than 2 cm. long (usually about 1 cm.).....10. *T. resupinatum*
- 10b. Florets pedicelled (pedicels 3 mm. or more long); peduncles usually more than 2 cm. long
- 11a. Inflorescence short-racemose, the pedicels arising along a distance of 2-5 mm. at the end of the peduncle.....11. *T. repens*
- 11b. Inflorescence umbellate, the pedicels all arising at the end of the peduncle
- 12a. Peduncles arising from creeping stolons; plants bearing cleistogamous flowers and fruit underground.....12. *T. amphianthum*
- 12b. Peduncles arising from upright stems; plants not bearing cleistogamous-flowers and fruit underground
- 13a. Calyx lobes about as long as wide
—13. *T. bejariense*
- 13b. Calyx lobes three times or more as long as wide.....14. *T. carolinianum*

1. *T. ARVENSE* L. Rabbit-foot Clover. (Fig. 1.) Known from a single Texas collection. MCLENNAN Co.: 0.5 miles southwest of Robinson, Lorena Road, Stinson pasture; colony of over 200 plants, *R. C. Mauldin*, June 6, 1949. Flowers whitish.



2. *T. WORMSKJOLDII* Lehm. (Fig. 2, map 2.) This clover of the Pacific Coast and southern Rocky Mountain regions has been collected in the Davis Mountains of Trans-Pecos Texas. JEFF DAVIS Co.: Davis Mountains, *M. S. Young*, Aug. 14, 1914 (in Herb. University of Texas and Missouri Botanical Garden).

3. *T. CAMPESTRE* Schreb. Hop Clover. (Fig. 3.) This is an introduced European species, first collected in Texas at Houston, HARRIS Co., *George L. Fisher* 19052, April 15, 1919.



Flowers yellow.

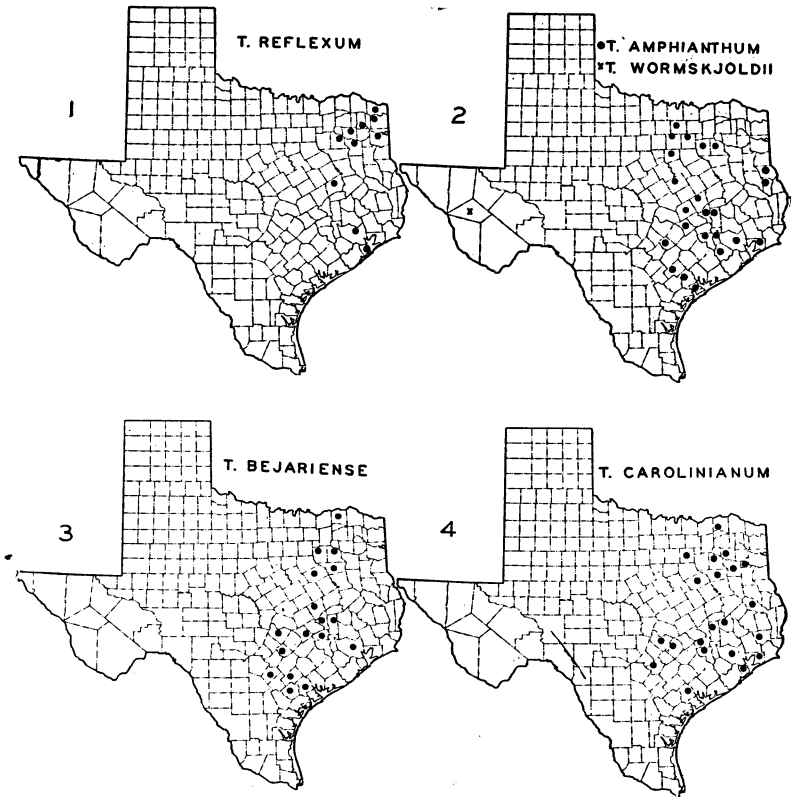
This plant is usually known as *T. procumbens* L. in American floras. Briquet (1913) states, "The Linnaean specific names of our clovers of the section *Chronosemium* ... are all *nomina confusa* in the most complete sense of the term. It is impossible, from the diagnoses and the habitat, to put them in order, and the cited synonyms are most often in disagreement between themselves and with the diagnosis, so that they have undergone the most diverse interpretation. We consider that these names should be completely abandoned, following the judicious counsel of MM. Ascherson and Graebner (Syn. VI, 2, 476 and 477)."²

²Translated by Dr. L. H. Shinnars.

4. *T. DUBIUM* Sibth. Least Hop Clover. (Fig. 4.) Differing from the preceding species chiefly in being smaller in all parts. An introduced species frequent on sandy soils in eastern Texas, first collected at Mineola, WOOD Co., *J. Reverchon*, April 24, 1901. Flowers yellow.
5. *T. PRATENSE* L. Red Clover. (Fig. 5.) Known from a single Texas collection. RED RIVER Co.: 0.2 miles west of Anona, a colony on roadside, *V. L. Cory 56021*, May 12, 1949. Varieties of this clover are common in cultivation farther north.
6. *T. INCARNATUM* L. Crimson Clover. (Fig. 6.) As yet known only in cultivation, well adapted to the eastern part of the State, and to be expected as an escape.
7. *T. SUBTERRANEUM* L. Subterranean Clover (the name commonly shortened to "Sub Clover"). (Fig. 7.) The specimens of this clover that were examined came from lawns on the grounds of Texas A. & M. Substation No. 6 near Denton, DENTON Co. Flowers white.
8. *T. FRAGIFERUM* L. Strawberry Clover. (Fig. 8.) No Texas specimens of this clover have been seen. However, it has escaped from cultivation in California, and may do so in this State.
9. *T. REFLEXUM* L. Buffalo Clover. (Fig. 9, map 1.) This is one of the five native clovers of Texas, found on sandy soils of the pine and oak belts of the eastern part of the State, chiefly in cut-over pine woods, grassed-over fields, and along roadsides and fence-rows. Standard magenta-red, wings and keel whitish.
10. *T. RESUPINATUM* L. Persian Clover. (Fig. 10.) As yet known only in cultivation. Flowers rosy lavender.
11. *T. REPENS* L. Dutch White Clover. (Fig. 11.) One of the most common cultivated species of lawns and pastures, and widely escaped. Flowers white.
12. *T. AMPHIANTHUM* T.&G. Peanut Clover. (Fig. 12, map 2.) A native species of sandy and sandy-clay soils of pastures and fields in the eastern part of the State. This has been called "peanut clover" because of the cleistogamous flowers and underground fruits, suggesting little peanuts. Above-ground flowers deep rose-red.

13. *T. BEJARIENSE* Moric. (Fig. 13, map 3.) A native species of sandy and sandy-clay soils along roadsides, fence-rows, open woods, and prairies in eastern Texas. Petals yellowish white, inconspicuous.

14. *T. CAROLINIANUM* Michx. Carolina Clover. (Fig. 14, map 4.) Another native species of sandy and sandy-clay soils in oak and pine woods, along roadsides and fence-rows in eastern Texas. Petals yellowish white, inconspicuous.



REFERENCES

- BENSON, LYMAN. Nomenclatorial recombinations in *Trifolium* and *Opuntia*. Leaf. West. Bot. 4: 209-210. 1945.
- BRIQUET, JOHN. Prodrôme de la Flore Corse 2: 280. 1913.
- EWAN, JOSEPH. The correct name for the Pacific involucrate *Trifolium*. Leaf. West. Bot. 3: 222-224. 1943.
- HOWELL, JOHN THOMAS. Marin County Flora. 1949. (*Trifolium*, pp. 168-172)