

*Carthamus lanatus* L., WOOLLY DISTAFF THISTLE. Annual, ± sclerophyllous, spinescent, rosetted, taprooted, typically 1-stemmed at base, mostly unbranched to midplant (branched throughout if canopy of young plant damaged), canopy having a terminal head on each branch, upper branches ascending and overtopping first shoot, erect, in range 35–95 cm tall; shoots with basal leaves and stiff, upward-folded, and arching cauline leaves on rigid stem, basal leaves of springtime becoming lower cauline leaves following elongation of internodes, at flowering lower leaves dead, brittle and somewhat persistent or breaking off above base, lobes of leaves spinelike to spine-tipped, the spines straw-colored, at each node often having an unexpanded axillary shoot = a tuft of blade-lobe spines, glandular-hairy and in range sparsely cobwebby on young growth often aging glabrescent, the glandular hairs abundant, short-stalked, mostly < 0.2 mm long, with colorless heads.

**Stems:** cylindric, to 6 mm diameter, very tough, satiny straw-colored. **Leaves:** helically alternate, mostly deeply 1-pinnately lobed or basal leaves sometimes having lobes with spine-tipped sublobes, with 2–7 pairs of subopposite lateral lobes, the lobes modified as spreading, spinelike teeth, the blade often somewhat folded upward from midrib presenting elevated spines, short-petiolate with narrow wings (the earliest basal leaves) and sessile and clasping with a spiny lobes at blade base (most lower leaves and all cauline leaves), without stipules; petiole flared at base to 5 mm, mostly short and indistinct from blade; blade oblong to lanceolate in outline, in range to 120 mm long, lateral lobes acuminate and often relatively straight, to 23 mm long, with smaller teeth on margin between or along lobes, 3–7-veined at base with principal lateral veins raised on lower surface, glandular-hairy sometimes also with persistent, damaged nonglandular hairs along principal veins on lower surface. **Inflorescence:** heads, each head terminal on a leafy, principal branch in open, cymelike arrays with several heads, head discoid, somewhat concealed by 1–4 ascending to spreading, spinescent leaflike bracts, many-flowered, exerted above involucre forming a cylindric tuft ca. 25 mm across, of ca. 22 flowers, flowers exerted ± 10 mm, bracteate; peduncle hidden by bases of leaves and bracts, 10–100 mm long, bracts triangular to lanceolate with 4–5 pairs of spreading and arching, spiny lobes, 35–60 × 17–30 mm (including spines), 4–8 mm wide between lobes, rigidly and sharply spined on lobe tips, sparsely cobwebby-hairy and with short-stalked glandular hairs, generally spiny-toothed on margins of sinuses and terminal lobe, 7(9)-veined at base with midvein prominent on upper surface and raised on lower surface; **involucre** ovoid, 25–28 mm long, at anthesis 13–15 mm diameter at base (excluding spines) to 7 mm wide at top, phyllaries 28 in 4–6 series, outer phyllaries rigid and leaflike resembling peduncle bracts, 29–37 mm long, 6–7.4 mm wide at base, with 2–5 lateral lobes and 2–5 teeth per side, the lobes spreading, narrowly triangular, 2–7.7 mm long, spinose with the terminal spine 4–4.5 mm long and lateral spines 1–4 mm long; middle phyllaries ovate to lanceolate, 19–22 × 6–7.4 mm, green and rigid with narrow, white-membranous margins, acute or slightly expanded at tip, the expanded tip entire or serrate, spine-tipped or not; inner phyllaries lanceolate, 18–19 × 3–3.8 mm, green with colorless membranous margins, acute and not expanded or with spine at tip; receptacle dome-shaped to conic, without bractlets (paleae), with a dense tuft of scales surrounding each ovary, the scales flattened, 4–13 mm long, whitish transparent. **Flower:** bisexual, radial but most bent outward below throat, 1.8–2.1 mm across; **calyx (pappus)** absent or with several scales (peripheral 8 flowers) or with 85–105 narrow scales in ca. 8 series (central flowers), scales narrowly oblong to linear-

oblanceolate,  $1.5-9.5 \times 0.2-0.5$  mm, increased from short outer scales to longer inner scales except the innermost series ca. 2–3 mm long, pale yellow having the long ones tinged with light purplish red between 1.5–3 mm from base, truncate to narrowly acute at tip, minutely barbed marginally and on lower surface; **corolla** 5-lobed, 25–31 mm long, glabrous; tube cylindric,  $18-23.5 \times 0.6-0.8$  mm, white at base grading to yellow at tip; throat narrowly bell-shaped,  $2.3-2.7 \times 1.3-1.7$  mm, yellow with 5 reddish orange to purplish red veins; lobes oblong,  $4.3-5 \times 0.6-0.7$  mm, bright yellow with 2 purplish red, submarginal veins; **stamens** 5, fused to base of corolla throat, 1.5–2 mm long, light yellow, ca.  $2/3$  from base with a whorl of ca. 12 flattened, transparent hairs; anthers fused into cylinder surrounding style,  $1/2$ -exserted, basifixed, dithecal, 4.2–4.7 mm long, light yellow with purplish red longitudinal stripes, short-tailed at base, with sterile appendages at tip, the appendages ca. 0.6 mm long and narrowly rounded at tip, longitudinally dehiscent; pollen pale yellow; **pistil** 1; ovary inferior, 4-angled,  $3 \times 1.8$  mm, whitish, oblique at base, conically dentate along rim, 1-chambered with 1 ovule; **nectary** at base of style,  $\pm$  barrel-shaped cupped and surrounding style base, ca.  $0.5 \times 0.25$  mm, slightly 5-lobed on rim; style 28–29 mm long, exserted ca. 2 mm above anthers, light yellow, stigmatic 3.9–4.2 mm at tip, 2-branched, the branches ascending but very short,  $\pm 0.3$  mm long, bluntly rounded. **Fruits:** cypsela, dimorphic; cypselae body  $\pm$  top-shaped,  $4.5-5 \times 3-3.5$  mm, of the peripheral flowers rough, brown, and lacking pappus scales, of other flowers rough and brown above midpoint and smooth and light brown below midpoint, with ca. 100 pappus scales, rounded at base, often 4-ribbed, having short teeth along rim, depressed on top of ovary; pappus scales mostly spreading and brown, outer scales from 1.5 mm long increasing to 9.5 mm long, central scales clustered, silvery, and  $\pm$  erect, ca. 3 mm long, minutely barbed on margins. Late May–late July.

Naturalized. Spinescent annual discovered during BioBlitz 2008 in the Cold Creek watershed at Stunt Ranch. *Carthamus lanatus* is an obnoxious weed that is physically dangerous to animals and humans, and attempts were made immediately by the California Native Plant Society to extirpate woolly distaff thistle from the range. Colonizers of this thistle population have been sparsely cobwebby on young growth as well as having abundant, somewhat inconspicuous glandular hairs.

B. A. Prigge & A. C. Gibson