



Weedy Mustards of Oklahoma

November 2017

Josh J. Lofton
Cropping Systems Extension Specialist

Misha R. Manuchehri
Weed Science Extension Specialist

Beatrix Haggard
Plant Science Youth Development

Vocabulary

- Apex (pl. apices):** the tip
Cauline: Of, on, or pertaining to the stem
Dentate: toothed along the margin, the teeth directed outward rather than forward.
Glabrous: lacking hair
Lanceolate: lance-shaped; much longer than wide, with the widest point below the middle.
Oblanceolate: inversely lanceolate, with the attachment at the narrower end.
Orbicular: approximately circular in outline.
Pedicel: the stalk of a single flower
Pinnate: resembling a feather, as in a compound leaf with leaflets arranged on opposite sides of an elongated axis
Pubescence: hairiness
Raceme: an unbranched, elongated inflorescence with flowers maturing from the bottom upwards
Rachis: the main stem
Silicle: fruit (less than twice as long as broad)
Siliqua: fruit (more than twice as long as broad)
Spatulate: like a spatula in shape
Stellate: star-shaped

The vegetative phase of winter canola is particularly sensitive to weed competition as plants take time to produce a canopy that is dense enough to shade out competing weeds. For winter canola, the four leaf to six leaf stage has been identified as the most critical period to control weeds (Aghaalkhani and Yaghoobi 2008). If weeds are not controlled during this time or emerge after the window, significant canola yield loss can be expected. One of the first steps in managing a weed in any cropping system is identification. This fact sheet describes how to identify several economically important mustards that often appear in Oklahoma canola cropping systems. Common herbicides and their efficacy on each species are also described in Table 1.

Camelina microcarpa DC.

Common name: smallseed falseflax
Description: Smallseed falseflax is an annual or winter annual mustard. Leaves clasp the stem, are 1 to 3 inches long

Oklahoma Cooperative Extension Fact Sheets are also available on our website at: <http://osufacts.okstate.edu>



Figure 1. Plant profile of smallseed falseflax. Note the leaves that clasp the stem. Inset: Close-up of the reproductive structure. Note the pear-like structures as compared to the traditional fruits of other mustards.

and have rough surfaces covered with hairs. Stems are also typically pubescent, especially the lower part of the stem. Racemes elongate with maturity and are 2 to 12 inches long. Fruits consist of pear-shaped pods about 0.25 inch long and are borne on a stalk about 0.5 inch long (Figure 1).

***Capsella bursa-pastoris* (L.) Medik.**

Common name: shepherd's-purse

Description: Shepherd's-purse is a winter annual or biennial mustard that can reach up to 1.5 feet tall. Flowering is initiated in the spring and can persist until early summer, depending on weather. Flowers are green or white, very small and difficult to see to the untrained eye. During the first growing season, it appears as a prostrate rosette with deeply lobed leaves and is 2 to 5 inches long and ½ to 2 inches wide (Figure 2). Siliques are distinctly heart-shaped, conspicuously divided into two compartments (Figure 3). The fruit shape is very helpful in distinguishing this species from other similar plants.



Figure 2. Shepherd's-purse basal rosette. Note the deeply lobed leaves and the prostrate growth pattern.



Figure 3. Reproductive growth of shepherd's-purse. Note the small white flowers with the heart-shaped siliques.

***Descurainia pinnata* (Walt.) Britt.**

Common name: tansymustard

Description: Tansymustard is a winter annual member of the mustard family. Flowering begins in March and continues through August. Flowering plants are typically 1 to 3 feet tall. Tansymustard flowers are bright yellow (sometimes whitish) in coloration. Leaves alternate along the stem and often are conspicuously bipinnate, with primary lobes of leaves also being lobed (Figures 4 and 5). Leaves often appear grayish with a dense stellate pubescence. The root system consists of a single taproot with finer, branching fibrous roots. Siliques are ¼ to ½ inch long and less than 1/10 inch wide, with two cells per fruit, each filled with tiny seeds (about 1/10 inch long). Siliques size is the most effective method of determining tansymustard from similar species, namely flixweed (Figure 6).



Figure 4. Bipinnate, lobed leaves of tansymustard. Figure 5. Short siliques of tansymustard.



Figure 6. Complete plant profile of tansymustard.

***Descurainia sophia* (L.) Webb ex Prantl**

Common name: flixweed

Description: Flixweed is a winter or summer annual or biennial mustard that flowers from July to August. Superficially, this species looks very similar to tansymustard in terms of size and color. The upper portion of the stem is densely pubescent, with the lower stem characterized as having stellate hairs. Size of leaf lobes is also characteristic of this species. Leaves of flixweed are more finely lobed than those of tansymustard, which have more conspicuously rounded lobes (Figures 7 and 8). Siliques are more elongated than those of tansymustard, being approximately $\frac{1}{2}$ to $\frac{3}{4}$ inches long and often are less than $\frac{1}{10}$ inch in width (Figure 8).



Figure 7. Bipinnate leaves of flixweed, similar to tansymustard but less lobed.



Figure 8. The reproductive structure of flixweed. Note the long siliques.



Figure 9. Close-up of the elongated siliques of the flixweed.



Figure 10. Full profile of a mature flixweed plant.



Figure 11. Young flixweed plant in the field.

***Erysimum repandum* L.**

Common name: bushy wallflower

Description: A winter annual mustard, bushy wallflower flowers from May through July and can grow up to 2 feet in height. Seedlings have spoon-shaped cotyledons, which are notched at the leaf apex. Leaves are alternate. Leaf blades are linear to lanceolate with coarsely dentate margins, especially in basal leaves. Upper leaves are often more entire (smooth margins) in leaf margins (Figures 12 and 13). Leaf surfaces are covered by two- and three-forked hairs. The root system of bushy wallflower is characterized by a single shallow taproot. The flowers are a bright yellow, with four petals, and often spread at right angles to the rachis. Siliques are 2 to 5 inches long, giving the plant a densely branched look (Figures 14 and 15). The slender siliques are about 2 to 4 ½ inches long and less than 1/10 inch in width.



Figure 12. Bushy wallflower rosette. Note the highly dentate margins.



Figure 13. Bushy wallflower at an early reproductive stage. Note the lanceolate leaves with the smoother margins on the upper leaves and the emerging 4 petal flowers.



Figure 14. Plant profile of bushy wallflower. Note the lanceolate leaves and long siliques.



Figure 15. Up-close view of long, slender siliques of bushy wallflower.

***Lepidium densiflorum* Schrad.**

Common name: greenflower pepperweed

Description: Greenflower pepperweed is a common annual weed of many Oklahoma crops. The plant begins its life cycle as a basal rosette approximately ½ inch across. These basal leaves are obovate in shape and the leaf margins are entire to slightly undulate. The root system consists of a stout taproot. Erect flowering stalks emerge from the basal rosette in late spring. These stems are grayish-green in color due to small, fine hairs. The margins of the upper cauline leaves can be entire, undulate or slightly dentate. Each cauline leaf clasps the stem at the base. The erect stems terminate in a raceme of white flowers and silicles will develop soon after (Figure 16). Each silicle is approximately ¼ inch long, flattened, and is divided into two compartments, each containing a single seed.



Figure 16. Plant profile of greenflower pepperweed during reproductive growth. Notice the circular silicles.



Figure 17. Growth habit of greenflower pepperweed.

***Lepidium virginicum* L.**

Common name: Virginia pepperweed

Description: Virginia pepperweed is an annual or biennial plant that can reach 20 inches in height. Leaves are alternate, and rosette leaf margins are double-lobed. Mature leaves are toothed to entire and are glabrous. Flowers are small and white. Silicles are 1/6 inch long, orbicular, flattened and notched at the top.



Figure 18. Close-up of Virginia pepperweed dentate leaves.



Figure 19. Rounded, flat, and dual-compartmentalized silicles of Virginia pepperweed.

***Sisymbrium altissimum* L.**

Common name: tumble mustard

Description: Reaching heights of 5 feet, tall tumble mustard is the largest wild member of the mustard family in Oklahoma. Most often characterized as a winter annual, tall tumble mustard has a single, large taproot making up its root system. Leaves of tall tumble mustard are alternate with large oblanceolate lower leaves and smaller, pinnately lobed upper leaves (Figure 20). Leaf margins are coarsely toothed with sinuses nearly reaching the midrib in lower leaves. Leaf surfaces are densely pubescent, most notable in lower leaves. A single stem emerges from a basal rosette, terminating in multiple branches above. Stems are also covered in dense pubescence. Siliques are linear, between 3 and 6 inches in length and ¼ to ½ inch in width.



Figure 20. Tumble mustard rosette. Note the coarsely toothed leaf margins.

Common name: field pennycress

Description: Field pennycress is a winter annual mustard. Mature plants are typically 1 to 2 feet in height. Like most mustards, the belowground root system consists of a single taproot. Rosette leaves are spatulate-shaped, with rounded or blunt apices and coarsely dentate margins. Upper leaves are more elliptical in shape with coarsely dentate margins and clasping petioles (Figure 21). Flowers have four white, spatulate petals (Figure 22). Fruits are orbicular siliques with winged margins, notched apices and separate into two halves (Figure 23). Each silique is ½ to 1 inch in diameter. Field pennycress is quickly distinguished by a combination of leaf shape and silicle size and shape.



Figure 21. Elliptical leaves of field pennycress. Note the shallow dentate on the upper leaves.



Figure 22. Plant profile of field pennycress. Note the white flowers with the uniquely shaped silicle.

References

Aghaalikhani, M and S.R. Yaghoobi. 2008. Critical period of weed control in winter canola (*Brassica napus* L.) in a semi-arid region.



Figure 23. Close-up of field pennycress siliques. Note the wide silicle with the notch at the apex when mature.

Table 1. Selected broadleaf herbicides labeled in winter canola and winter wheat and their efficacy on various mustards.

	Application Timing	Weeds									
		Smallseed falseflax	Shepherd's -purse	Tansymustard	Flixweed	Bushy wallflower	Greenflower pepperweed	Virginia pepperweed	Tumble mustard	Field pennycress	
Canola Herbicides											
Glyphosate PowerMAX	POST	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX
Sonalan HFP	PPI	P	P	P	P	P	P	P	P	P	P
Stinger	POST	P	P	P	P	P	P	P	P	P	P
Trifluralin 4EC	PPI	P	P	P	P	P	P	P	P	P	P
Wheat Herbicides											
Ally XP**	POST	EX	EX	G*	G*	G	EX	EX	EX	EX	EX
Banvel	POST	G*	EX	EX	EX	EX	EX	EX	EX	EX	EX
Beyond**	POST	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX
Finesse Cereal & Fallow**	PP/PRE/POST	EX	EX	G*	G*	EX	EX	EX	EX	EX	EX
Huskie	POST	NA	EX	EX	EX	EX	F	EX	EX	EX	EX
MCPA Ester 4	POST	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX
Olympus**	PRE/POST	EX	EX	EX	EX	G	NA	EX	EX	EX	EX
Outrider**	POST	NA	EX	EX	EX	G	G	EX	EX	EX	EX
Powerflex HL **	POST	G	EX	EX	EX	G	F	EX	EX	EX	EX
Quelex**	POST	EX	EX	EX	EX	EX	F	EX	EX	EX	EX
Sentrallas	POST	F	EX	F	EX	EX	NA	EX	EX	EX	EX
Talinor	POST	G	EX	G	G	NA	NA	EX	EX	EX	EX
2,4-D LV 4	POST	EX	EX	EX	EX	EX	F	EX	EX	EX	EX

Abbreviations: POST, post emergence; PPI, preplant incorporated; PRE, preemergence; PP, preplant; EX, excellent; G, good; F, fair; P, poor; NA, data not available.

* See the specific weed instructions section on the respective herbicide label for more information regarding management.

** ALS herbicides are only efficacious on mustard biotypes that have not developed ALS resistance.

The Oklahoma Cooperative Extension Service

WE ARE OKLAHOMA

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education

for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.

- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.



**SOUTHERN
EXTENSION
RISK MANAGEMENT
EDUCATION**

Appreciation is extended to Southern Extension Risk Management Education for financial support of research.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, and Title IX of the Education Amendments of 1972 (Higher Education Act), the Americans with Disabilities Act of 1990, and other federal and state laws and regulations, does not discriminate on the basis of race, color, national origin, genetic information, sex, age, sexual orientation, gender identity, religion, disability, or status as a veteran, in any of its policies, practices or procedures. This provision includes, but is not limited to admissions, employment, financial aid, and educational services. The Director of Equal Opportunity, 408 Whitehurst, OSU, Stillwater, OK 74078-1035; Phone 405-744-5371; email: eeo@okstate.edu has been designated to handle inquiries regarding non-discrimination policies; Director of Equal Opportunity, Any person (student, faculty, or staff) who believes that discriminatory practices have been engaged in based on gender may discuss his or her concerns and file informal or formal complaints of possible violations of Title IX with OSU's Title IX Coordinator 405-744-9154.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President for Agricultural Programs and has been prepared and distributed at a cost of 40 cents per copy. 1217 GH.