k-state extension AGRONOMY e-Updates

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1. Mustard species in Kansas

Tansy mustard and flixweed

Tansy mustard and flixweed are two similar mustard species common in central and western Kansas. These weeds emerge in the fall and grow as a rosette with finely lobed compound leaves. Tansy mustard and flixweed bolt in the spring. Small orange seeds are produced in long, narrow seed pods. Seed pods of tansy mustard are usually about 1/2 inch long and thicker than flixweed seed pods, which are generally 1 to 1 1/2 inches long.

Tansy mustard **(***Descurania pinnata*) is a native winter annual. The plant is covered with fine hairs. The stem is erect, branched and 4 - 30" high. The flowers are small, pale yellow, and occur in small clusters. Tansy mustard spreads by seed from early to late summer.

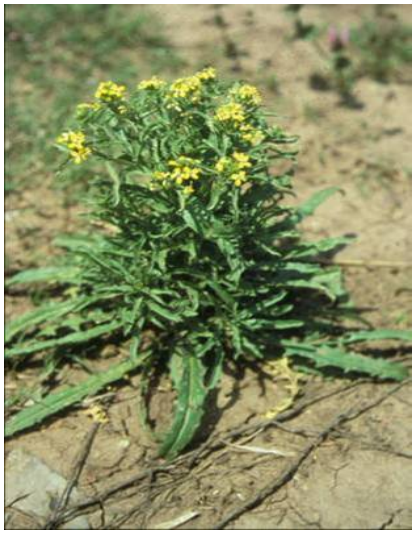
Tansy mustard. (All photos by Dallas Peterson, K-State Research and Extension)

Flixweed (*Descurainlia sophia*) is very similar to tansy mustard, and often confused with it. It is an introduced annual or winter annual which reproduces by seed. Stems are erect, branched, and 4 - 40" high. Flixweed often grows taller than wheat, while tansy mustard generally does not. Leaves have a lacy appearance. The stem and leaves are covered with fine hairs. Flowers are small, pale yellow, and grow in small clusters. Flixweed is one of the first weeds to appear in spring.

Flixweed.

Bushy wallflower (treacle mustard)

Bushy wallflower, or treacle mustard, (*Erysimum repandum*) is a common weed in central and eastern Kansas. It is native to Eurasia. It usually emerges in the fall and forms rosettes with long narrow leaves and irregular leaf margins. Most vegetative growth occurs during the spring. Bushy wallflower rosettes bolt in the spring and bear bright yellow flowers at the top of the plant, which only grows to about 12 – 18" tall. Seeds are produced in long, narrow seed pods.



Bushy wallflower, or treacle mustard.

Field pennycress

Field pennycress (*Thlaspi arvense*) is native to Eurasia. The seedling develops as a compact, vegetative rosette. If it emerges in the fall, it overwinters either as seed or vegetative rosettes. It can also emerge from seed in the spring. It bolts in the spring and bears white flowers at the top of the plant, which may grow from 1 to 2 feet tall. Field pennycress has a flat, broadly winged seed capsule that looks something like a penny. Field pennycress reproduces solely by seed. It is often found in grain fields, roadsides and other disturbed areas. Once this weed is established in a field, the soil will soon become contaminated with its seeds. It is an aggressive competitor with crops, and can cause significant yield reductions. Field pennycress may produce from 1,600 to 15,000 seeds/plant. The seed shatters readily. Seed dispersal is chiefly by wind. Seeds can remain viable for as long as 6 - 10 years or more in the soil. This persistent viability of field pennycress seeds in the soil, their capacity to germinate when brought to the surface by cultivation, and the very large reservoir of dormant seeds present in the soil of a heavily infested area are all factors that contribute significantly to the persistence of this troublesome weed. Field pennycress has a strong foul odor, even causing cows to produce bitter flavored milk after eating it. It is sometimes called stinkweed.

Field pennycress in wheat.

Blue mustard

Blue mustard (*Chorispora tenella*) is a winter annual that germinates in the late summer and fall, and produces a rosette similar in appearance to a dandelion. The plant overwinters as the rosette. Blue mustard bolts in the spring. With mild February weather the flower stalk may elongate in early March. Cold weather in February results in late March elongation. It bears purple or blue flowers at the top of the plant, which may grow from 12 – 18" tall. Seeds are produced in long, narrow seed pods 1 to 2 inches long. Viable seed can be produced approximately 10 days after bloom. Blue mustard is a problem in winter annual crops, such as winter wheat, throughout Kansas. Blue mustard was introduced into the U.S. from Siberia.

Blue mustard.

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2. Control of mustards in wheat

Mustards are a common broadleaf weed in wheat throughout Kansas. Unfortunately, producers often do not notice these weeds in their fields until they start to bloom in the spring. As a result, producers often don't think about control until that time. Although it is still possible to get some control at that time with herbicides, mustards are much more difficult to control at that stage and often have already reduced wheat yields by then.

To keep yield losses to a minimum, mustards should be controlled by late winter or very early spring, before the plants begin to bolt, or stems elongate. If winter annual broadleaf weeds are present in the fall, they can be controlled with any number of ALS-inhibiting herbicides, including Ally, Amber, Finesse, Olympus, or PowerFlex. Huskie, 2,4-D, and MCPA can also provide good control of most mustards if the weeds are at the right stage of growth and actively growing, and if the wheat is at the correct growth stage.

In the later winter or early spring, blue mustard is perhaps the most difficult of the winter annual broadleaf weeds to control because it bolts very early. To be effective on blue mustard, herbicides typically need to be applied to blue mustard in late February or early March. Blue mustard is more difficult to control than tansy mustard with 2,4-D because blue mustard has often already bolted by the time 2,4-D can be safely applied to wheat. Thus, 2,4-D often is applied too late to be effective on blue mustard.

Flixweed and tansy mustard should be treated when they are no larger than two to three inches across and two to three inches tall. As these plants become larger the control decreases dramatically. Ester formulations of 2,4-D and MCPA are more effective on tansy mustard and flixweed than amine formulations. Field pennycress is easier to control than tansy mustard or flixweed. Herbicide applications made before the pennycress bolts are usually effective. Wheat should be fully tillered before applying 2,4-D or tillering will be stopped and wheat yields may be decreased.

Most ALS-inhibiting herbicides control winter annual mustards very well, although there are populations of treacle mustard and flixweed in Kansas now that are ALS-resistant, and cannot be controlled by these products.

Alternative control measures will be needed to control these populations. The best approach is to use other herbicides such as 2,4-D, MCPA, or Huskie as an alternative or in a tank-mix with the ALS herbicides. MCPA can be applied after the wheat is in the 3-leaf stage; but as mentioned above, 2,4-D should not be applied until after wheat is fully tillered -- which often doesn't occur until spring. Huskie can be applied between the 1-leaf and flag leaf stage of growth. None of these herbicides has much residual control, so the majority of weeds need to be emerged and actively growing at the time of treatment.

Some producers commonly apply ALS herbicides with fertilizer in January or February. Unfortunately, MCPA, 2,4-D, and Huskie are most effective when applied to actively growing weeds, so application when weeds are dormant may not provide good control. As a result, if an ALS-inhibitor tank-mix with one of these herbicides is applied to dormant ALS-resistant mustards in the winter, poor control can be expected.

ALS-resistant bushy wallflower seems to be present in a number of fields in central Kansas. ALS-resistant flixweed has only been confirmed in the Saline county area, but may start to show up elsewhere. Producers should watch for cases of poor control, and consider alternative herbicides or herbicide tank-mixes to help prevent or manage ALS-resistant weeds.

Crop rotation with corn, grain sorghum, soybeans, cotton, or sunflowers is a good way of controlling the mustards. Crop rotation will usually result in a gradual reduction of mustard populations in the future as the seedbank in the soil gradually decreases.

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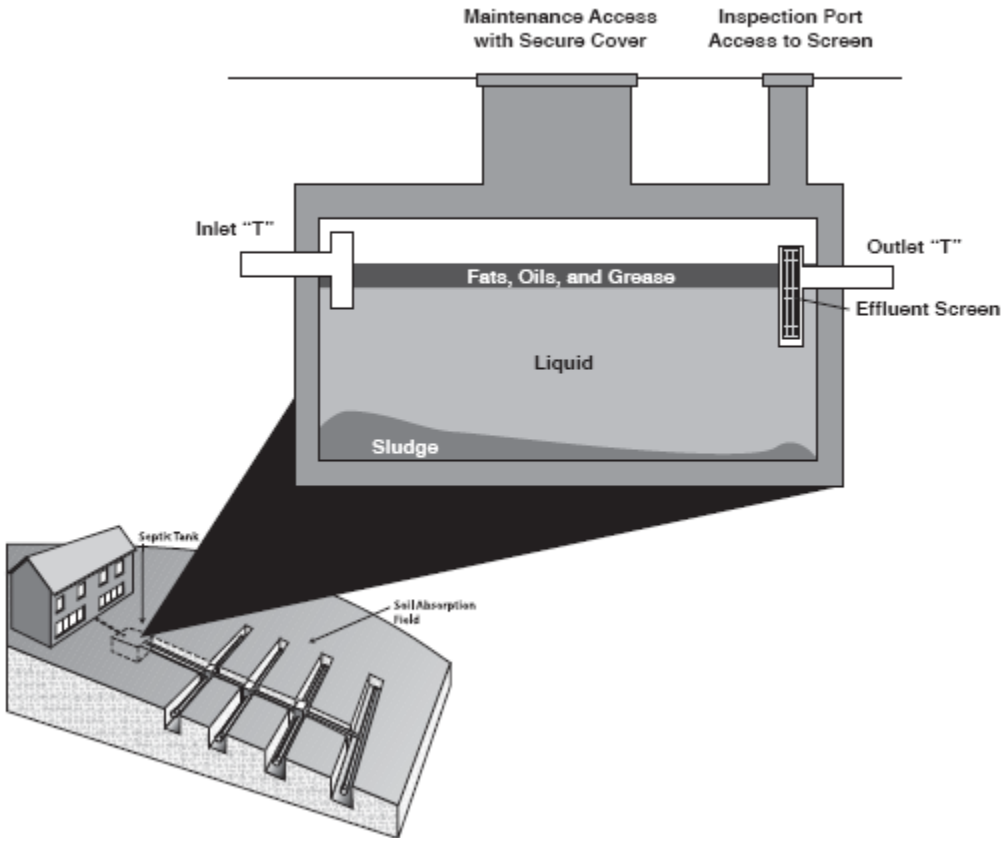
3. What to avoid putting into onsite wastewater treatment systems

When living in the country, septic systems or other onsite wastewater treatment systems are the norm. In 2007, the EPA reported that an estimated 20 percent of total U.S. housing units were served by septic systems. Of these, 50 percent were in rural areas, 47 percent were in suburbs, while 3 percent were found in central cities.

Most onsite wastewater treatment systems consist of a septic tank and some type of soil treatment area. The soil treatment area typically contains gravity laterals, drip field, etc. Whatever soil treatment is used, consideration should be given to the fact that anything placed down the drain potentially could be detrimental to the function or components of the septic system or to groundwater quality.

In the septic tank, three layers develop. The bottom layer is the solids (sludge), which settle out in the tank. The middle layer is the partially clarified water, or effluent. The upper layer is comprised of floating scum, including fats, oils, and greases (called FOG for short). These

materials are lighter than water and float to the surface. Only the effluent from the middle layer should enter the soil absorption field because solids and scum eventually plug the oil pores and lead to slower rates of absorption and potential system failure.



There are two broad categories of items that should not be put into a septic system: "Cloggers" and "Killers"

Cloggers: Diapers, cat litter, cigarette butts, baby wipes, coffee grounds, grease, feminine hygiene products, etc. All of these can contribute to a buildup in either the sludge or FOG layer. Therefore, they should never be flushed or put down a drain. Also, it is not a good idea to put large quantities of food waste at one time into an onsite wastewater treatment system, as this can cause the sludge and/or FOG layer to build up more quickly, and adds more biochemical oxygen demand on the beneficial microbes in the onsite wastewater treatment system.

Killers: Household chemicals, gasoline, oil, paint, pesticides, antifreeze, unused prescription medications, etc. Remember that onsite wastewater treatment systems treat wastewater—they do not dispose of water. If strong chemicals such as those listed above are added to the system, they might temporarily kill off the beneficial microorganisms, resulting in little or no treatment of the wastewater. Also, many of these chemicals are toxic to other biological organisms, and could end up damaging the quality of the groundwater. Whenever possible, use local household hazardous waste programs to dispose of your unused chemicals, so that they might be properly recycled by professionals. Return unused prescription medications to pharmacies, or dispose of

them in the trash. If you're worried about children, animals, or thieves getting medications out of the trash, you could put them inside another container and tape it tightly, or combine it with coffee grounds.

For more information, see K-State publication *Onsite Wastewater Treatment System Additives*, MF-2877, http://www.ksre.ksu.edu/library/h20ql2/mf2877.pdf.

Also, see the Environmental Protection Agency's Septic Systems Fact Sheet, http://www.epa.gov/owm/septic/pubs/septic_systems_factsheet.pdf.

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These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, Agronomy e-Update Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you'd like to have us address in this weekly update, contact Steve Watson, 785-532-7105 swatson@ksu.edu, or Jim Shroyer, Research and Extension Crop Production Specialist and State Extension Agronomy Leader 785-532-0397 jshroyer@ksu.edu