

Weed Biology & Management

Biology and Management of Fall Panicum (*Panicum dichotomiflorum*) in Christmas Tree Production

Fall panicum (Panicum dichotomiflorum) is a serious weed in several cropping systems such as corn, soybeans, nurseries, Christmas trees, alfalfa, and many others. It is commonly known as smooth witchgrass, western witchgrass and belongs to the grass family Poaceae. It is a summer annual weed which emerges in late spring, flowers from July to October and then dies with frost. Fall panicum is known to produce profuse number of seeds which can range up to 500,000 per plant. In Christmas tree production, fall panicum is an important dominant annual grass weed species which needs to be managed well, especially during the establishment phase of the Christmas trees.

Biology of Fall Panicum:

The seedlings of fall panicum often have a purple coloration. First true leaves and the seed leaves are parallel to the ground, linear in shape, and densely hairy on their underside. The true leaves are hairless after the fourth or fifth leaf stage. Mature plants are mostly hairless and can reach up to 5 feet tall. Stems are waxy in texture with irregularly spaced, swollen nodes that give the stem a zigzagged appearance. Hairy ligules are 0.06 inch long, auricles are absent. Sheaths are compressed and hairy. Red to purple sheaths are compressed, smooth, hairless, and generally open at the top. The leaf blades are dull green in color with reddish edges, glossy undersides, and linear shaped ranging from 4-20 inches long by

0.25-0.75 inch wide. Leaves have a pale green to whitish prominent midvein. Since it belongs to the grass family, the root system is fibrous with spontaneous roots developing at lower stem-sheath joints.

The inflorescence is widely-spaced, 4-16 inches long panicle with subdividing branches. The panicles are purplish when mature and are located at stem ends and in leaf joints. There are presence of narrow stiff stems support stalks known as spikelets at the branch tips. The spikelets are dull yellow to purple in color, 0.10-0.12 inch long by 0.08 inch wide, and oval to thumb shaped. Spikelets each can produce a single dull, yellow-brownish colored, 0.06-inch-long seed that shatters soon after ripening.



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Series for Christmas Tree Production



Fall-panicum-seedhead

Propagation is by seeds. Seedling emergence primarily occurs from soil depths of 0 to 2 inches with most emerging at 1/2- to 1-inch soil depths.

Similar species:

Witchgrass (*Panicum capillare*) seedlings have hairs on both the surfaces of leaf blade. Wild-proso millet (*Panicum miliaceum*) is distinguished from fall panicum by its half membranous, half hairy ligule. Yellow foxtail (*Setaria pumila*) is similar at the seedling stage, but it has hairless sheaths and long wispy hairs near the base of the blade.

Management of Fall Panicum:

Non-chemical control: Regulation of weed seed production is the key to successful prevention. Prevention by cleaning equipment and using weed-free and fresh, uncontaminated soil is the best course of action. Regular scouting in the field and controlling weeds along farm roads is always suggested to manage the weed species at an early stage. Avoid soil compaction since this favors fall panicum. Similarly, if the field has drainage problems, drain tile or other measures to improve drainage will increase the competitiveness of crops relative to the weed.

Chemical control: Chemical control includes the application of preemergence and postemergence herbicides. Preemergence

herbicides need to be applied either before germination of the weed seeds or just after the germination, when the seedlings are very small. The following are some of the preemergence herbicides that are labeled for use in Christmas tree production and have shown good control of fall panicum: flazasulfuron (Mission), atrazine (Aatrex), prodiamine (Barricade), pronamide (Kerb), indaziflam (Marengo), pendimethalin (Pendulum Aqua cap) (Zandstra and O'Donnell, 2018). Whereas, s-metolachlor (Pennant magnum) and dimethenamid-P (Tower) have shown excellent control of fall panicum. Postemergence herbicides are applied at later stages, and they are most effective when applied to young actively growing weeds that have not reached their reproductive stages. Glyphosate (Roundup ultra) has shown excellent control of fall panicum (Zandstra and O'Donnell, 2018). Other postemergence herbicides that can provide good control are clethodim (Envoy Plus), fluazifop (Fusilade), and sethoxydim (Sethoxydim). It is highly recommended to read the manufacturer's label of the herbicides before application and make sure the application timing is right and the herbicide is safe for the Christmas tree varieties.

REFERENCE:

Zandstra, B. and J. O'Donnell. 2018. Weed control in Christmas trees. Michigan State University Extension bulletin E3237. ▲