WRITTEN FINDINGS OF THE
WASHINGTON STATE NOXIUOS WEED CONTROL BOARD
(Updated November 1998)

Scientific Name: *Sorghum halepense* (L.) Pers.

Common Name: Johnsongrass

Family: Poaceae

Legal Status: Class A

Description and Variation:
Johnsongrass is an erect, perennial grass that ranges from 3 feet to 10 feet tall. The stems are solid with prominent, swollen nodes. The leaves are alternate, and range from 12 to 30 inches long and ½ to 1 inch wide, with a noticeable white mid-vein. The stem terminates in a reddish inflorescence of an open, pyramid shaped panicle, from 6 inches to 24 inches long. At each joint of the panicle, two or three branches occur. The flowers, or spikelets, are in pairs at the lower end of this flowering stalk, and in threes at the upper end. The pair includes one spikelet with male flowers, and it has short stalks. The spikelet with fertile, female flowers is sessile – it does not have a stalk. When found in threes, there is one fertile spikelet and two infertile spikelets. The fertile spikelets are usually a purplish black when mature. The mature inflorescence droops with age. Seeds are 1/8 inch to 3/16 inch long, glossy and a mahogany color. The tip of the seed stalk is knob-shaped, a distinguishing characteristic of Johnsongrass from the closely related sudangrass. Johnsongrass has fibrous roots and extensive, creeping rhizomes. The rhizomes are thick and fleshy, and whitish with purple or red, and they are segmented.

Economic Importance:
Detrimental: A serious weed pest in all annual agricultural crops, orchards, vineyards, ditches, roadsides and fence rows. Lands infested with Johnsongrass can produce 7 tons of rhizomes per acre, and 10 bushels of seed per acre (McWhorter 1981). Under conditions of stress, Johnsongrass produces hydrocyanic acid, which is toxic to grazing livestock. It is mentioned as one of the top ten worst weeds in the world (Holm 1969). Johnsongrass is a host for sorghum midge; a pollen contaminant of sorghum for seed; a host of sugarcane mosaic virus; and it's size makes it a safety hazard for roadsides (Monaghan 1978).
Beneficial: Introduced as a forage crop in pastures.

Habitat:
Johnsongrass grows in a variety of soils, and it thrives in fertile lowlands. In the Midwest, Johnsongrass is found along roadsides, waste areas and fields, preferably in moist sites. It is a weed of cultivated fields.

Geographic Distribution:

Johnsongrass is native to the Mediterranean region. The botanical name means "sorghum from Halepa", the origination point in Syria (Haragan 1991). Worldwide distribution is found in major agricultural areas in warm regions (Holm 1969 as cited in Monaghan 1978). This species was introduced and planted as a forage species extensively in the US: Montana, Michigan, South Dakota, Wyoming, Iowa, Nebraska and California. Initially it was thought that Johnsongrass was a serious weed threat only to southern climates, because of an inability to overwinter. However, the range of this species spread northward since the 1960's. Johnsongrass is found in the lower 2/3 of the US, and in Washington, Oregon, northern Idaho, Utah and southwestern Ontario.

History:
Introduced to the United States in the early 1800's as a potential forage crop, or hay. Seeds were introduced from Turkey in the 1830's, and planted in a southern river bottom plantation by a man named Johnson – the plant flourished and spread across the south. By the late 1800's it was widely planted in the United States. The USDA started an organized control program for Johnsongrass in 1900.

Growth and Development:
Johnsongrass is a perennial, producing seed the first year. In cold climates it completes an annual life cycle. Seedlings develop rhizomes 3 to 4 weeks after emergence (McWhorter 1981). The ability for Johnsongrass to survive cold climates depends on how deep the rhizomes are found in the soil. Winter tolerance is based on rhizome depth, not on plant biotypes, or physiological adaptations (Hartzler et al. 1990). Low soil temperatures may be a limiting factor in the spread of Johnsongrass. Seeds can survive lower temperatures than rhizomes, indicating the importance of rhizome development in the establishment and spread of this species (Stoller 1977). A single plant can produce more than 5000 nodes in a growing season (McWhorter 1971).

When Johnsongrass is stressed (wilting caused by drought, frost, herbicide spray), or mechanically injured (trampled) toxic amounts of cyanide is found in the young leaves, and stems. Mature plants have lower toxicity, and cured hay is safe to eat.

Reproduction:
Johnsongrass spreads by seeds and by rhizomes. Old stems will root if they are plowed into moist soils. Each rhizome segment, or node, can produce shoots and roots. 90% of rhizome production is after seed head formation, and one plant can produce 300 feet of rhizomes in one month (McWhorter 1981). Seeds remain dormant in the soil for several years.

Response to Herbicide:
Herbicides will control the upper plant, but they do not always translocate to the dormant buds found on the rhizomes, and these buds remain viable and later germinate (McWhorter 1972a). Preemergent treatment will control seedlings, but not established stands. Ecotypes of Johnsongrass may be responsible for variable control rates of foliar-applied herbicides (McWhorter 1971). For site specific control information, refer to the annually updated PNW Weed Control Handbook.

Response to Cultural Methods:
Cultural control methods in established stands of Johnsongrass are effective only if rhizome development is controlled. Rhizome production is reduced if plants are kept shorter than 12 to 15 inches. Well managed crop rotation provides competition, and it slows the development of rhizomes. Mowing or grazing are considered a control method, and it increases the susceptibility of this weed to other control measures (McWhorter 1981). Flooding is a practical control option in the Mississippi River valley (McWhorter 1972).

Response to Mechanical Methods:
Repeated tillage is an effective control strategy. Smaller rhizome fragments are brought to the soil surface, where they are susceptible to desiccation and freezing winter temperatures. Shoots developing from these rhizome fragments are less vigorous (Lolas and Coble 1980 and McWhorter and Hartwig 1965 as cited in Hartzler et al. 1990). If cultivation is not repeated, the infestation can spread, since broken rhizome segments can produce roots and shoots (Fischer et al. 1985). Fields cultivated every 4-5 weeks offer the best results, and the recommendation is to used several tools - one to cut the rhizomes into small sections, and another to bring the fragments to the soil surface.

Biocontrol Potentials:
None known.

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***References available** from the Washington State Noxious Weed Control Board Office in Kent*

Rationale for Listing:

Johnsongrass is known worldwide as an invasive and competitive species in agricultural lands, waste places, fields and roadsides. At one time considered to be a noxious weed in the southern, warmer climates, evidence indicates that this species is moving northward, and will overwinter in Canada. It spreads by seeds, and rhizomes and by rhizome fragmentation. Prevention is the best control option for this species. Education and awareness will prevent this species from establishment. As a Class A noxious weed, eradication is the goal, and at this time, the distribution is limited in Washington.