Sheath Blight This important disease of rice is very widespread in Arkansas and easily found in 50-66% of rice fields. It can reach to damaging levels in most long term rice fields growing highly susceptible semidwarf long grain rice varieties. Actual yield loss to sheath blight appears to have lessened somewhat with the development of more tolerant varieties and improved cultural practices employed by many farmers. However, yield losses of 5-15% are still fairly common in many fields. Losses of 50% and greater, reported in the 1980's on Lebonnet and other very susceptible varieties, are now only rarely observed and in most cases are confined to smaller areas of fields. Before 1970, sheath blight was only a curiosity in Arkansas, but with the introduction of shorter and more susceptible varieties during the 1970's - 1980's, the increased use of nitrogen fertilizer for higher grain yields on these varieties, alternate year rice rotations, and reduced tillage practices, sheath blight rapidly became the most widely established rice disease in the state. Sheath blight is more consistent but much less dramatic than blast, causing routine problems and losses in many fields each year. Weather can affect the severity of the disease with hot, humid years resulting in greater damage state-wide than years with cooler summers.

Symptoms - Sheath blight is usually not noticed until late tillering to midseason (panicle differentiation). Early symptoms include oval sheath spots (lesions) at or just above the water line, often at the junction of the leaf and sheath. Early lesions are pale green to offwhite with a narrow purple-brown or brown border, usually 2" or less wide and 1-2" long on most varieties. Lesions may join as the disease moves up the plant. Both sheaths and leaves are commonly attacked and killed as the disease grows upward

Other sheath spot diseases sometimes confused with sheath blight include black sheath rot (Gaeumannomyces graminis var graminis), stem rot (Sclerotium oryzae), aggregate sheath spot (Rhizoctonia oryzae-sativae), and bordered sheath spot (Rhizoctonia oryzae) (Fig.1). The first two diseases have black or gray-black lesions on the leaf sheaths. Aggregate sheath spot lesions are very similar to sheath blight lesions but have a narrow, brown vertical line in the center of the lesion, do not tend to overlap, and the disease rarely attacks the leaf blades. Bordered sheath spot lesions also tend to be separate and distinct, be more brown in color, have wide dark brown borders, and usually only appear on the sheaths

Sheath blight can grow from plant to plant, either across narrow stretches of water or from leaves touching other leaves. The disease may move 1" per day up the plant under ideal conditions of cloudy weather, high temperatures (82 - 90 F), and high humidity (95%+) in the rice canopy. Sclerotia of the fungus are formed on the sheaths and leaves as early as a week after leaf and sheath lesions are seen, but are more typically observed on infected rice in the boot to heading stages. Sclerotia are initially white and slightly fuzzy, rapidly turning brown with an irregular shape. They average about 1/8" in diameter, resembling tiny potatoes with the side next to the plant being flat or concave, and eventually fall to the ground where they survive until the next host crop. On current varieties, the bottom portion of panicles on heavily infected tillers will blank if the disease destroys the flag leaf before grain fill is complete. Sheath Blight can infect the panicle under severe conditions, destroying all grain fill, and stick the panicle together into a vertical "spike" with its hyphae (microscopic fungal threads).

Cause - Sheath blight is caused by the fungus Rhizoctonia solani AG1-1A, also called Thanatephorus cucumeris. This fungus is very widespread in agricultural crops, but exists as many forms under this one name. The form attacking rice can also attack soybeans, causing aerial blight, and persist on other summer crops like corn or grain sorghum. It can also attack many grassy weeds in and around fields under the right environmental conditions. While it can infect these other hosts, the fungus causes the most damage to rice. R. solani overwinters in the soil as long-lived and tough sclerotia, and grows on infected plants as microscopic hyphae (threads). It also forms a sexual stage on rice, which appears as a thin white layer on the lower plant stems that looks like frost, shortly after midseason and then disappears. Little is known about the role of this stage in nature. Disease Cycle - Sheath blight is a modified single cycle disease. This means that the fungus infects a plant and does not produce a new generation on that plant which will attack other plants the same season. This differs from blast, a multiple cycle disease, which infects then produces several generations of spores that in turn infect other plants in the field the same season. Sheath blight grows from plant to plant, however, so an initial infection can spread short distances (usually 3 ft. or less) in the same growing season. Thus, sheath blight is the type of disease that tends to build up via accumulated sclerotia in the same fields or areas of fields, attacking the plants in these areas each time rice is planted, but usually does not spread to uninfected field regions during a single growing season. Sheath blight starts when a sclerotium or a piece of infected plant stem from a previous season floats to the surface of the flood water and comes into contact with a rice stem (Fig.2). The fungus grows out onto the sheath at the flood line and begins growing upwards on the plant, occasionally penetrating the sheath and causing a lesion or spot, and to nearby plants in the row. As the rice plant shifts to the reproductive stage (panicle differentiation or midseason) the disease becomes more aggressive, causing larger lesions and damage and growing upwards more rapidly. The fungus eventually reaches the upper leaves or panicles (blows out the top) resulting in damaged "circles" or patches up to several feet in diameter in the field. These are readily observed from the combine during harvest and are often congregated in lower ends of fields or near levees and field edges where sclerotia and infected plant debris are congregated over time by rainwater between crops or flushing and initial flooding of each rice crop. Factors that increase the disease include consistent use of highly susceptible semidwarf long-grain rice varieties, short rotations (rice each year or every other year), overuse of nitrogen fertilizer, and reduced tillage practices that encourage the survival of the fungus.

Management - There is no "silver bullet" control method for sheath blight. Control is largely based on adopting a rice production system that allows one to "live with" the disease, reducing the inevitable loss as much as possible. We recommend a three-pronged attack against the disease: 1) growing more tolerant varieties; 2) using cultural practices not favorable to the disease; and 3) fungicides when disease levels exceed a threshold level in a particular field. Tolerant varieties are the first option that should be considered. While all varieties are somewhat susceptible to damage under the right conditions, taller, opencanopied types have much less yield loss from sheath blight than the semidwarf varieties. This is probably due to several factors, but the simple fact is that damage is mostly due to the disease destroying the upper two leaves before grain fill is complete - and this is harder for sheath blight to accomplish on a 40-42" tall variety than on one 36" tall or less. The taller types also tend to have a more open canopy for more sunlight penetration and lower humidity than the shorter versions, slowing the disease. Also, long grain varieties are more susceptible than medium grain varieties, so if medium grains can be grown on historical sheath blight fields, so much the better. Many county agents, consultants and farmers have recognized the value of rotating tolerant varieties on sheath blight problem fields for several years now and, when combined with other appropriate cultural practices, this has resulted in more consistent and higher rice yields than before, without the need for fungicides