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Cypress: A High Yielding, High Quality Long-Grain Rice Variety

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Introduction

'Cypress' is a high yielding, early maturing, semidwarf long-grain rice variety with excellent grain quality. Cypress was developed at the Rice Research Station in Crowley, Louisiana, and released by the Louisiana Agricultural Experiment Station in cooperation with the Arkansas Agricultural Experiment Station, the Florida Agricultural Experiment Station, the Mississippi Agricultural and Forestry Experiment Station, the Texas Agricultural Experiment Station, and the U.S. Department of Agriculture - Agricultural Research Service.

History

Cypress originated from the cross 'L-202'/'Lemont' made at the Rice Research Station in 1983. The L-202 (8) parent is an early maturing, semidwarf long-grain variety developed by the California Cooperative Rice Research Foundation at the Rice Experiment Station, Biggs, California. The Lemont (1) parent is an early maturing, semidwarf long-grain variety developed by the USDA-ARS in conjunction with the Texas Agricultural Experiment Station at the Rice Research and Extension Center in Beaumont, Texas. Cypress is an F_5 bulk of a single progeny row in the breeding nursery at Crowley in 1986, selection 8621296. It was evaluated in the preliminary yield nursery (experimental designation 8702646) in 1987 and entered into

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the Cooperative Uniform Regional Rice Nurseries (URRN) in 1988 with the designation RU8802051. In the same year, it was entered into the statewide advanced yield (AY) testing program.

Cypress was entered into the statewide commercial variety (CV) and variety x nitrogen (N) testing programs in 1989. In addition, the line was first evaluated for disease reactions, response to gibberellic acid treatments, and herbicide tolerance.

A 500-panicle row increase was planted at the winter nursery in Lajas, Puerto Rico in December 1989. This increase was harvested and returned to the Rice Research Station for planting in May 1990. A breeder seed field was planted and harvested in the summer of 1990. This seed was used to plant a 20-acre field of foundation seed in April 1991. A variety release committee meeting was held in November 1991, and a decision was made to recommend to the Louisiana Agricultural Experiment Station that the experimental line be released as a variety for commercial production. Cypress was officially released on March 1, 1992, and 1,182 cwt of foundation seed were made available to Louisiana producers.

Characteristics

Cypress has a semidwarf plant type and is similar in height to 'Lacassine,' Lemont, and 'Gulfmont.' In the URRN grown in Louisiana, Arkansas, Mississippi, and Texas (1988-91), the average height of Cypress was 38 inches and those of Lacassine, Lemont, and Gulfmont were all 37 inches. By comparison, 'Katy,' a conventional height variety, averaged 46 inches in height in those same tests. The variety, because of its inherent short stature and straw strength, has displayed good resistance to lodging. However, lodging has been observed, especially under high levels of N combined with very strong winds.

The flag leaf blade of Cypress is somewhat narrow, remains upright through physiological maturity, tends to droop as plants approach harvest maturity, and averages 12 inches in length during the booting stage of growth. The leaves, lemma, and palea of Cypress are glabrous. The spikelet is straw-colored and awnless. The apiculus is purple at heading, but the color fades as the grain approaches maturity. The variety is in the early maturity group, and days to heading averages 85 for Cypress, compared with 85 for Lacassine, 87 for Lemont, and 85 for Gulfmont (URRN, 1988-91).

The grains of Cypress are typically very clear in appearance and length/width ratio averages 3.18 for milled grains (Table 1). Additional grain dimensions and weights are given in Table 1. Cypress has displayed

Table 1.--Paddy, brown, and milled grain dimension and weight of Cypress, Lacassine, Lemont, Gulfmont, and Katy rice grown at Crowley, Louisiana, in 1991

Cultivar	Length (L)	Width (W)	Thickness	L/W ratio	Weight
		(mm)			-(mg)-
Paddy Rice					
Cypress	9.27	2.47	2.01	3.76	25.1
Lacassine	9.67	2.67	2.03	3.62	27.2
Lemont	9.33	2.80	1.94	3.33	27.4
Gulfmont	9.53	2.87	1.97	3.33	25.2
Katy	9.07	2.53	1.92	3.58	23.7
Brown Rice					
Cypress	7.27	2.27	1.81	3.20	21.0
Lacassine	7.67	2.34	1.82	3.28	22.3
Lemont	7.80	2.47	1.74	3.16	23.4
Gulfmont	7.80	2.40	1.83	3.25	23.6
Katy	7.67	2.27	1.71	3.38	19.0
Milled Rice					
Cypress	7.00	2.20	1.71	3.18	17.9
Lacassine	7.20	2.20	1.85	3.27	19.0
Lemont	7.13	2.33	1.67	3.06	20.3
Gulfmont	7.33	2.26	1.73	3.24	21.4
Katy	6.93	2.07	1.65	3.36	15.4

excellent milling characteristics (Table 2). Milling yields (percent whole kernel: percent total millled) have averaged 61:70, 58:70, 60:69, and 60:71 for Cypress, Lacassine, Lemont, and Gulfmont, respectively (URRN, 1988-91). Results of studies since 1989 have indicated that Cypress possesses a high level of resistance to fissuring (or sunchecking) at decreasing harvest moistures. When grain moisture contents decreased to 14 percent before harvest, percent fissured grains for Cypress and Lemont were 12 and 66, respectively. Such a level of resistance in Cypress allows a greater latitude in timing of harvest and secures an optimum milling quality over a wide range of harvest moistures.

The endosperm of Cypress is non-glutinous and non-aromatic, and it has a light brown bran. The cooking and processing qualities are typical of southern U.S. long-grain cultivars. The variety is characterized as a relatively high amylose, intermediate gelatinizing type.

Cypress has displayed excellent yield potential. Data from multi-year and multi-location testing are presented in Table 2. In the URRN (1988-91), Cypress averaged 6,531 lb/A, compared with 6,810, 6,175, and 6,487 lb/A

Table 2.--Comparative yield and milling tests of Cypress, Lacassine, Lemont, and Gulfmont by researchers from the Rice Research Station and cooperators from adjacent states, 1988-91

		Cypress		Lacassine		Lemont		Gulfmont	
Year	Test-Location	Yield (lb/A)	Milling % Head-Total	Yield (lb/A)	Milling % Head-Total	Yield (lb/A)	Milling % Head-Total	Yield (lb/A)	Milling % Head-Total
1988	URRN[1]-Crowley, LA	7900	63-70	7153	60-70	7058	64-71	7226	63-71
	URRN-Stuttgart, AR	7595	67-73	7156	66-74	6916	67-47	7173	64-74
	URRN-Stoneville, MS	7094	65-70	6937	63-71	6527	63-71	6602	63-70
	URRN-Beaumont, TX	4125	49-66	6706	53-68	5073	54-69	6777	57-70
	AY[2]-Crowley, LA	7062	68-73	6365	58-73	5875	64-75	5870	60-73
	AY-Lake Arthur, LA	6701	58-71	6441	48-71	6489	48-72	6269	49-72
	AY-Cheneyville, LA	8511	66-72	7573	60-72	7642	64-72	7219	69-72
	AY-Epps, LA	7203	67-72	7187	66-73	6990	66-74	6920	62-74
	AY-Jones, LA	9037	68-72	8727	63-72	8590	63-73	8252	63-72
1989	URRN-Crowley, LA	4397	51-65	4984	51-66	4200	55-68	4467	56-68
	URRN-Stuttgart, AR	7683	68-73	7706	61-73	6460	62-74	7670	61-73
	URRN-Stoneville, MS	5865	65-71	6299	55-71	5369	53-71	5609	66-72
	URRN-Beaumont, TX	6162	60-69	7055	61-71	6574	66-71	6813	65-71
	AY-Crowley, LA	5772	58-70	5620	57-71	5398	59-71	----	-----
	AY-Lake Arthur, LA	5219	47-61	5210	45-63	5210	45-63	----	-----
	AY-Cheneyville, LA	6678	63-70	6569	61-70	6605	65-71	----	-----
	AY-Epps, LA	7252	65-71	7200	67-75	7105	67-73	----	-----
	AY-Jones, LA	8476	67-72	8530	63-71	8110	64-71	----	-----
	CV[3]-Crowley, LA	3967	54-65	4846	50-66	4920	58-69	4793	59-68
	CV-Pine Island, LA	4260	47-63	4803	46-65	4457	56-70	4772	54-68
1990	URRN-Crowley, LA	8828	62-72	8429	57-74	7732	62-73	7388	63-73
	URRN-Stuttgart, AR	8346	66-72	8368	59-72	7175	63-73	7832	62-73
	URRN-Stoneville, MS	7218	64-69	6679	61-70	6436	64-70	6024	62-69
	URRN-Beaumont, TX	5371	52-69	6584	50-69	5981	58-69	6459	51-69
	AY-Crowley, LA	8076	58-67	7728	61-70	7186	60-69	----	-----
	AY-Lake Arthur, LA	6806	57-68	7361	61-70	6813	54-68	----	-----
	AY-Cheneyville, LA	6828	60-68	6739	62-72	6470	58-71	----	-----
	AY-Epps, LA	9084	68-72	7724	65-73	8253	68-74	----	-----
	AY-Jones, LA	7797	63-69	8738	60-69	7906	64-70	----	-----
	CV-Crowley, LA	7905	59-68	7410	61-72	7521	61-71	7258	65-73
	CV-St. Joseph, LA	7140	-----	6529	-----	7012	-----	7149	-----
	CV-Pine Island	3365	-----	3429	-----	4133	-----	3475	-----
1991	URRN-Crowley, LA	5597	59-68	5515	55-68	5233	58-69	5106	57-69
	URRN-Stuttgart, AR	7635	67-71	8204	60-72	7431	56-72	7371	57-73
	URRN-Stoneville, MS	6629	69-71	6823	63-71	6144	64-71	6349	65-71
	URN-Beaumont, TX	4060	53-68	4368	46-67	4498	52-69	4920	53-68
	AY-Crowley, LA	6236	62-70	5805	56-72	----	-----	----	-----
	AY-Lake Arthur, LA	5261	55-67	5594	56-70	----	-----	----	-----
	AY-Cheneyville, LA	6017	65-73	6025	65-73	----	-----	----	-----
	AY-Epps, LA	8123	64-70	8004	63-72	----	-----	----	-----
	AY-Jones, LA	7910	65-72	8502	62-71	----	-----	----	-----
	CV-Crowley, LA	6525	62-69	6024	56-69	5931	57-71	5848	58-71
	CV-St. Joseph, LA	6938	-----	6563	-----	6607	-----	5812	-----

1 URRN = Cooperative Uniform Regional Rice Nursery (Data provided through the courtesy of Kenneth Gravois and Karen Moldenhauer, Rice Research & Extension Center, Stuttgart, AR; Dwight Kanter, Delta Research and Extension Center, Stoneville, MS; C.N. Bollich and Anna McClung, Texas A&M Research and Extension Center, Beaumont, TX.).

2 AY = Advanced Yield Test (Rice Research Station, Crowley, LA; Lounsberry Farm, Lake Arthur, LA; Bollich Farm, Cheneyville, LA; Perry Farm, Epps, LA; Zaunbrecher Farm, Jones, LA).

3 CV = Commercial Variety Test (Rice Research Station, Crowley, LA; Trahan Farm, Pine Island, LA; Northeast Research Station, St. Joseph, LA).

for Lacassine, Lemont, and Gulfmont, respectively. Ratoon crop data, though limited, indicate that Cypress has a good potential for ratoon cropping.

Variants observed and removed from increase fields of Cypress included any combination of the following: taller, pubescent, earlier, later, intermediate grain, and medium-grain type. The total number of variants numbered less than 1 per 5,000 plants.

Classes of seed will be breeder, foundation, registered, and certified. Breeder and foundation seed will be maintained by the Rice Research Station, P.O. Box 1429, Crowley, Louisiana 70527-1429.

Cultural Management

Agronomic performance of Cypress, as with most semidwarf long-grain varieties, will be highly dependent on cultural management. Grain yields of Cypress are moderately high without intensive water management or high rates of fertilizer N. Maximum yield potential will, however, occur with ideal growing conditions and optimum cultural management, especially with respect to fertilizer N and water management.

Seedling vigor of Cypress is good in a drill-seeded system. Careful attention during stand establishment is still necessary for best performance. Cypress should be planted into weed-free, uniform, and level seedbeds, and should be seeded less than 1 inch deep for best results. Cypress has displayed very good seedling vigor when water-seeded. The seedbed should be prepared in a roughened, cloddy, or grooved condition to minimize seed drift and to promote rapid seedling anchorage and stand establishment. In either cultural system, water management will have a significant influence on stand establishment, early-season plant growth, and grain yield. Fields should be levelled with no more than a 0.2 foot fall between levees. Less fall is desirable as long as drainage is not impaired.

In drill-seeded or dry-broadcast plantings, approximately 15 to 30 units of N per acre should be incorporated prior to planting. This preplant N encourages early growth, more rapid stand establishment, and will often allow for earlier establishment of the permanent flood. On soils requiring phosphorus, potassium, sulfur, or zinc, these applications should also be made preplant. A soil test is an excellent diagnostic tool for determining the nutrient requirements of rice for most nutrients, with the exception of N.

Flushing may be necessary for stand establishment if seedbed moisture is inadequate. Flushing will promote uniform emergence and more rapid stand establishment.

Emergence and seedling growth of Cypress, as with many semidwarf varieties, are increased by gibberellic acid. Evaluations in 1991 and 1992 showed Cypress planted 3 inches deep at 100 lb/A under varying environmental conditions averaged an adequate stand of 12 plants/ft^2 (2,4). With the addition of gibberellic acid seed treatment, the stand of Cypress was increased to 17 plants/ft^2. Stands between 10 and 20 plants/ft^2 are considered necessary for maximum grain yield. In similar evaluations, both Lemont and L-202 (semidwarf parents of Cypress) had marginal stands of 10 plants/ft^2. A satisfactory stand for Lemont and L-202 of 14 plants/ft^2 was obtained with gibberellic acid. Lacassine had suboptimal stands of 7 plants/ft^2 under the same conditions. With gibberellic acid, Lacassine stands were doubled to 15 plants/ft^2. Following emergence, applying gibberellic acid to seedlings (3- to 4-leaf stage) of Cypress and Lacassine increased plant height by 2 inches above normal in 7 days after treatment (3,5). Growth responses of Lemont and L-202 averaged 1 inch.

The use of gibberellic acid seed treatment on Cypress would be an added precaution when dry planting deep to reach available moisture. Planting to moisture takes advantage of available soil moisture for germination and reduces flushing. Following emergence, application of gibberellic acid on Cypress timed with postemergence herbicides provides the extra seedling height needed to establish an early, uniform flood. The extra seedling height may be especially helpful in unlevel fields and when flooding quickly behind a postemergence herbicide application, which enhances weed control and reduces multiple postemergence herbicide applications prior to flood.

By the fourth- or fifth-leaf stage, or about 30 to 35 days after seeding, all or most of the required N should be applied to a preferably dry seedbed just prior to establishing a shallow, permanent flood. Applying fertilizer N into the flood on young seedling rice should be avoided since this is the most inefficient method of N management. Delaying N application and permanent flood establishment should also be avoided since reduced tillering, increased weed problems, lower fertilizer efficiency, and decreased grain yields may occur.

In the water-seeded, pinpoint flood system, all or most of the required N and any other fertilizer nutrient should be preplant incorporated into a dry seedbed. If the field is drained for an extended period after water-seeding and the permanent flood is delayed, N should be applied and managed as in the dry-seeded system.

Regardless of planting method, it is often necessary to apply N at midseason, especially if only a portion of the total N requirement was applied at planting. Generally, 30 to 50 units per acre are adequate, provided

that sufficient basal N was properly applied. The rice crop should be monitored on a regular basis for N deficiency symptoms, and topdress applications should be made during early reproductive growth or when deficiency is apparent. Corrective applications of N should be applied by the panicle differentiation (PD) stage. It is questionable whether yield responses occur when N is applied after PD.

On soils where straighthead is known to occur, water and N management should be modified. Only 50 to 60 percent of the required N should be applied either preplant or preflood, depending on the cultural system. The field should be drained during mid-tillering and allowed to dry. Complete aeration of the soil is necessary to alleviate potential damage due to straighthead. The remaining N should then be applied, and the field reflooded by the panicle initiation (PI) or green ring growth stage. The DD-50 Rice Management Program can be used to predict the dates to drain for straighthead and to reflood at PI (7).

The potential for optimum second crop yields will be greater when Cypress is planted early, when main crop stubble has not been damaged by field rutting at harvest or by disease in the main crop, and when additional N is applied to the second crop. Up to 75 units of N should be applied immediately after main crop harvest, followed by a shallow, permanent flood.

Herbicide tolerance screening indicates that Cypress is not unusually susceptible to rice injury from any labelled rice herbicide application. However, any variety can be injured by certain herbicide treatments under specific environmental conditions.

For a more detailed discussion of all aspects of rice fertilization and cultural management, refer to the *Rice Production Handbook* (Louisiana Cooperative Extension Service publication 2321)(7).

Pest Reaction

Cypress was rated susceptible to sheath blight, caused by the fungus *Rhizoctonia solani* Kuhn, in inoculated disease nurseries in Crowley, Louisiana. However, sheath blight reactions were consistently less than those of Lemont. Growers are encouraged to avoid dense stands and excessive N fertilizer.

Cypress is moderately susceptible to rice blast (*Pyricularia grisea* Sacc.) races IB-1, IB-49, and IC-17 and highly resistant to the other blast races occurring in the U.S. Under field conditions, Cypress, like Lacassine, does develop rotten neck blast under epidemic conditions and should be monitored

for disease development. To reduce damage from blast, avoid late planting (after May 15), maintain a 4- to 6-inch flood, and do not over fertilize with N.

Cypress was rated moderately susceptible to leaf smut (*Entyloma oryzae* H. & D. Snydow), highly resistant to narrow brown leaf spot (*Cercospora janseana* (Racib) O. Const.), and appears resistant to brown leaf spot (*Cochiobolus miyabeanus* (Ito & Kur) Drech) under natural inoculum pressures in Louisiana disease nurseries. These diseases rarely occur with enough severity to warrant disease control measures. Cypress is moderately resistant to the physiological disorder straighthead.

Fields should be scouted weekly for disease development beginning when the first tillers begin to develop and continuing through heading. Rice should be sampled at several (20 or more) locations throughout the field. The size of the field and the disease distribution will determine the extent of sampling. At each sampling location, 25 to 50 tillers should be examined for disease symptoms. Refer to Louisiana Agricultural Experiment Station Bulletin No. 828, *Rice Diseases and Disorders in Louisiana*, for scouting information (6). Other diseases that require fungicides for control, especially the rice blast disease, must be noted between scouting stops because damaging levels can develop from light infestations that are not detected at the scouting stops. For sheath blight, the percentage of tillers infected at the sampling locations should be averaged to determine the disease incidence for the field. A fungicide application for sheath blight may be necessary on Cypress to maximize yields if infestation exceeds 10 percent of the tillers infected during the jointing stages of growth. Unfortunately, there is no good scouting/prediction system for blast at this time, and when leaf blast is found, preventative sprays at boot and heading are suggested. Consult your Cooperative Extension Agent for the latest information on fungicide usage.

Literature Cited

1. Bollich, C. N., B. D. Webb, M. A. Marchetti, and J. E. Scott. 1985. Registration of Lemont rice. Crop Sci. 25:883-885.
2. Dunand, R., R. Dilly, Jr., and G. Meche. 1991. Gibberellic acid seed treatment rice variety screen. Ann. Res. Rpt., Rice Res. Stn., La. Agri. Exp. Stn., LSU Agricultural Center, 83:170-177.
3. Dunand, R., R. Dilly, Jr., and G. Meche. 1991. Foliar gibberellic acid rice variety screen. Ann. Res. Rpt., Rice Res. Stn., La. Agri. Exp. Stn., LSU Agricultural Center, 83:198-204.
4. Dunand, R., R. Dilly, Jr., and G. Meche. 1992. Gibberellic acid seed treatment variety screen. Ann. Res. Rpt., Rice Res. Stn., La. Agri. Exp. Stn., LSU Agricultural Center, 84:In Press.
5. Dunand, R., R. Dilly, Jr., and G. Meche. 1992. Foliar gibberellic acid rice variety screen. Ann. Res. Rpt., Rice Res. Stn., La. Agri. Exp. Stn., LSU Agricultural Center, 84:In Press.
6. Groth, D. E., M. C. Rush, and C. A. Hollier. 1991. Rice diseases and disorders in Louisiana. LSU Agricultural Center, Louisiana Agricultural Experiment Station Bull. 828. 37 pp.
7. Linscombe, S. D., et al. Rice Production Handbook. LSU Agricultural Center, La. Coop. Extn. Serv. Pub. 2321. 63 pp.
8. Tseng, S. T., H. L. Carnahan, C. W. Johnson, J. J. Oster, J. E. Hill, and S. C. Scardaci. 1984. Registration of L-202 rice. Crop Sci. 24:1213-1214.

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