UofA UNIVERSITY OF ARKANSAS
DIVISION OF AGRICULTURE
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Agriculture and Natural Resources

Computer Technical Series

RICESEED

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RICESEED is a computer program which calculates the recommended seeding rates for rice under varying conditions. The **RICESEED** program generates the recommended seeding rate for rice varieties based on research conducted on the effects of various factors, including soil texture, seeding date, seeding method and seedbed condition.

Technical Information

Much of the data upon which this program is based was obtained from research conducted by Wade Faw and R. K. Porter at the Rice Branch Experiment Station in Stuttgart from 1971 through 1973. The results were published as MS-287, *Effect of Seeding Rate on Performance of Rice Varieties*. Additional research conducted by Dr. R. S. Helms and Dr. K. A. Gravois in 1992 has been incorporated into the program for several new varieties. A brief summary follows.

The objectives of Faw and Porter's research were to determine the effect of seeding rate on seedling density, yield components and rough rice yields. Briefly, the results indicated a positive correlation between seeding rates and seedling densities, panicles per square foot and lodging. A negative correlation was found between seeding rates and florets per panicle, grains per square foot and mature plant height. No correlation was found to link rate of seeding to percentage of empty florets or grain weights. An effective maximum grain yield was observed due to the inverse relationship between the number of panicles per square foot and number of grains per panicle.

Helms and Gravois examined the yield response of Adair, Katy and Millie to seeding rate and stand density. Results indicated that Katy and Millie produced higher yields when the stand density was about 25 plants/square foot compared to the previous recommended optimum stand density of 15 to 20 plants/square foot. Based on this research, seeding rate recommendations for Katy and Millie were increased by 20 percent. Thousand seed weights were determined from research tests involving rice variety performance testing by Dr. K. A. K. Moldenhauer, University of Arkansas plant breeder.

Description of Calculations

The percent increase in the optimum seeding rate can be determined by utilizing the description of seeding method and date, soil type and seedbed preparation (Tables 1 and 2). For a particular situation, the percent increase under each factor in

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Table 1. Additive Factors Increasing Optimum Seeding Rate	
Variable	**% Added**
Seeding Method	
Dry seeded-drilled	0
Dry seeded-broadcast	20
Water seeded-broadcast	30
Soil Type	
Sand	0
Silt	0
Clay	20
Seedbed Preparation	
Good	0
Fair	10
Poor	20
Seeding Date	
Early	
Before April 5 (South Arkansas)	10
Before April 10 (Central Arkansas)	10
Before April 15 (North Arkansas)	10
Optimum	
Late (after June 1)	30

Table 2. Factors for Increasing Seeding Rate for Water Seeded Rice	
Variable	**% Added**
Water Seed[1]	30
Seedbed Preparation	
No-till	20
Conventional till	
Good (Grooved)	0
Poor (Ungrooved)	20
Seeding Date	
Early	
Before April 5 (South Arkansas)	10
Before April 10 (Central Arkansas)	10
Before April 15 (North Arkansas)	10
Optimum Dates	
Late (after June 1)	10

[1]Based on optimum seeding rate (Table 3). Factors are additive to a maximum of 60% above optimum.

Tables 1 and 2 is additive. However, the cumulative increase of these factors will cease at 60 percent. Seeding rates 60 percent greater than normal should be sufficient to produce an adequate stand of rice under most environmental and soil conditions.

Utilizing Tables 1 and 2, the following calculations can be made for a given variety of rice:

Equation 1

Seeds/sq ft = (optimum number seeds/sq ft) × (1 + decimal % increase from Table 1 or 2 [cumulative to 60%])

Equation 2

Pounds of seed per acre = [(seeds/sq ft × 43,560 sq ft/acre)/(1,000 × 454 grams/lb)] × (1,000 seed wt in grams from Table 3)

Equation 3

Bushels of seed per acre = (lb seed/acre)/45

Equation 4

Calculation for seed per linear row ft in 6 to 12 inch row spacing: Seeds/row ft = (seeds/sq ft)/(drill row spacing in inches/12)

Water Seeding

The following seeding rate recommendations for water seeding are based on the use of pre-germinated seed (soak 24 to 36 hours and drain 24 to 36 hours before planting).

Seeding rates for water seeded rice are increased 30 percent over conventional drill seeded rice due to several factors that may influence stand establishment. Water seeded rice is more susceptible to stand reduction from seedling drift, the rice midge and blackbirds compared to dry seeded rice. Soil type has less of an effect on stand establishment in a water seeded system and, therefore, is disregarded in the calculation of optimum seeding rate.

Seedbed preparation is very important since seedling drift can be a major problem with conventional tillage. A good seedbed is defined as one that has been grooved or heavy clay that is rough and cloddy. The groover (implement) packs the soil while making indentations in which the seed will settle, thus reducing potential for seedling drift. Increase

Table 3. Optimum[1] and Maximum Seeding Rates for Rice Varieties							
Variety	Seed Weight[2]	Seeding Rate					
		Optimum	Maximum	Optimum	Maximum	Optimum	Maximum
	grams	seed/sq ft		lb/acre		bu/acre	
AB 647	25.30	40	64	97.1	155.4	2.16	3.45
Ahrent	22.20	40	64	85.2	136.3	1.89	3.03
Alan	21.90	40	64	84.0	134.5	1.87	2.99
Banks	22.90	40	64	87.9	140.6	1.95	3.12
Bengal	27.80	40	64	106.7	170.7	2.37	3.79
Cheniere	22.76	40	64	87.4	139.8	1.94	3.11
CL 121	23.80	40	64	91.3	146.1	2.03	3.25
CL 161	22.00	40	64	84.4	135.1	1.88	3.00
Cocodrie	22.00	40	64	84.4	135.1	1.88	3.00
Cybonnet	24.30	40	64	93.3	149.2	2.07	3.32
Cypress	23.70	40	64	91.0	145.5	2.02	3.23
Dellmont	26.70	40	64	102.5	164.0	2.28	3.64
Dixiebelle	22.40	40	64	86.0	137.5	1.91	3.06
Drew	22.90	40	64	87.9	140.6	1.95	3.12
Earl	27.40	40	64	105.2	168.3	2.34	3.74
Francis	22.75	40	64	87.3	139.7	1.94	3.10
Jackson	24.40	40	64	93.6	149.8	2.08	3.33
Jasmine-85	25.10	40	64	96.3	154.1	2.14	3.43
Jefferson	28.70	40	64	110.1	176.2	2.45	3.92
Katy	20.80	48	76	95.8	151.7	2.13	3.37
Kaybonnet	20.80	40	64	79.8	127.7	1.77	2.84
LaGrue	25.10	40	64	96.3	154.1	2.14	3.43
Lemont	26.21	40	64	100.6	160.9	2.24	3.58
Litton	23.30	40	64	89.4	143.1	1.99	3.18
Madison	22.10	40	64	84.8	135.7	1.88	3.02
Maybelle	23.90	40	64	91.7	146.8	2.04	3.26
Medark	28.50	40	64	109.4	175.0	2.43	3.89
Newbonnet	21.74	40	64	83.4	133.5	1.85	2.97
Nortai	23.20	40	64	89.0	142.5	1.98	3.17
Pirogue	27.30	40	64	104.8	167.6	2.33	3.73
Priscilla	25.90	40	64	99.4	159.0	2.21	3.53
Rexmont	22.73	40	64	87.2	139.6	1.94	3.10
Rosemont	25.20	40	64	96.7	154.7	2.15	3.44
RT7015	22.50	40	64	86.4	138.2	1.92	3.07
Saber	20.65	40	64	79.3	126.8	1.76	2.82
Wells	25.20	40	64	96.7	154.7	2.15	3.44

[1]Assumes good seedbed, drill seeded, silt loam, optimum planting date, conventional tilled.
[2]Grams per 1,000 seed.

the seeding rate 20 percent if the final seedbed has been prepared with an implement such as a field cultivator. The soil surface may become smooth after flooding a loose seedbed, especially on silt loam and sandy soils.

The last factor to consider is seeding date. Seeding date primarily influences the rate of seedling development and stand establishment. Seeding rates should be increased 10 percent for early or late planting. Contact your county Extension agent for additional information.

The computer program is available online at www.aragriculture.org.

For producers that do not have Internet access, the program can be run in the county Extension office after the relevant information has been provided.

For more information on rice seeding rates or other rice management topics, contact your local county Extension office or visit our web page at www.aragriculture.org.

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