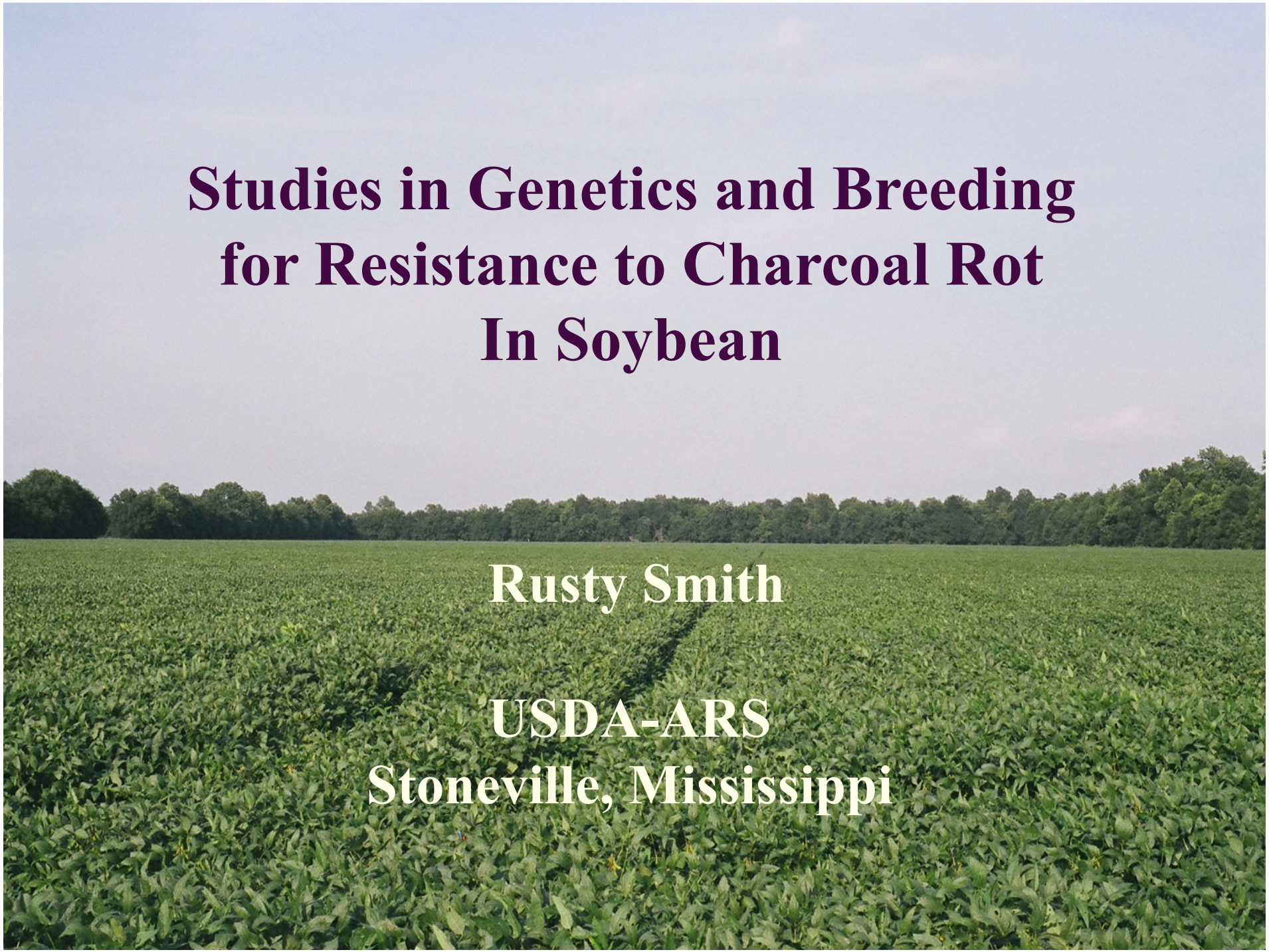

Studies in Genetics and Breeding for Resistance to Charcoal Rot In Soybean

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Development of Population 42

DS97-84-1

- S to charcoal rot.
- R to SCN races 1, 2, 3, 4, 5, and 14.
- MR Reniform nematode.

DT97-4290

- MR to charcoal rot (Paris et al., 2006).
- R stem canker, SMV, and PRR.
- MR frog eye leaf spot.

Single-Plant Screening Protocol

- Bosket fine-loamy soil.
- Mark rows and infest furrows (1g/ft).
- Hand plant and thin plots (1pl/ft).
- F_2 plants, F_3 lines, parents & checks.
- RCBD.
- RSS ratings (Mengistu et al., 2007).


1316
1315
1314
1313
1312


82

Summary Single-Plant Plots in Stoneville from 2003-2006

- Not a good relationship between single F_2 plants and replicated F_3 families.
- Replicated RILs tested over locations and years are necessary.
- 600+ SSR markers tested for polymorphism between parents of Pop 42; 162 Polymorphic.
- 157 linked SSR markers used to create genetic linkage map.
- Map order verified with composite map. (Shultz et al., 2007).

Growth Stage at the Time of Charcoal Rot Assessment

- Bosket fine-loamy soil, 2005.
- Single-plant plots.
- 4 x 4 factorial, CRD, 16 reps.
- Four soybean lines.
- Four growth stages.

Mean root and stem severity (RSS) ratings at four growth stages across all soybean lines (DS97-84-1, Magellan, A5979, and DT97-4290)

Growth Stage	Mean RSS Scores
R8 + 1 week	3.0 a
R8	2.7 a
R7	1.6 b
R6	1.1 c

Mean RSS scores followed by the same letter are not different at $P \leq 0.05$.

Mean root and stem severity (RSS) ratings of four soybean lines across all growth stages (R6, R7, R8, R8+1 week)

Soybean Line	Mean RSS Scores
DS97-84-1	3.0 a
Magellan	2.1 b
A5979	2.0 b
DT97-4290	1.4 c

Mean RSS scores followed by the same letter are not different at $P \leq 0.05$.

Mean root and stem severity (RSS) ratings according to soybean line and growth stage

Soybean Line	R6	R7	R8	R8 + one week
DT97-4290	1.1 f	1.0 f	1.5 ef	1.9 def
A5979	1.0 f	1.5 ef	3.0 bcd	2.4 cde
Magellan	1.0 f	1.0 f	2.9 bcd	3.3 abc
DS97-84-1	1.2 f	2.8 bcd	3.5 ab	4.4 a

Mean RSS scores followed by the same letter are not different at $P \leq 0.05$.

Single-Row Screening Protocol (2007-2009)

- Bosket fine-loamy and Sharkey clay soils.
- Single-row plots (9 feet).
- 272 RILs, parents, and 40+ checks.
- RCBD with 3 reps, 2008-09.
- Inoculation at time of machine planting (1g/ft).
- Sample 5 pl/plot at R7.2 - R7.8.
- CFU data instead of RSS data (Mengistu et al., 2007).


IRONCLAD


TAKING BACK
SUNDAY

Stoneville ESPS Trials

Entry	2009 bu/a	2009 R8	2007 cfu/g	2008 cfu/g
Y227-1	54.7	23-Aug	200	
Y227-2	53.3	23-Aug	200	
Y163-2	52.5	22-Aug	0	
LD00-3309	51.3	21-Aug		
AG3905	48.7	24-Aug		
Saline	48.1	20-Aug		20,000
DT97-4290	43.9	9-Sep	233	367
DS95-217-1-880	35.5	22-Sep	400	133
5601T	34.6	23-Sep		
Pharaoh		12-Sep	3,333	5,217

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- Reducing soybean yield losses from disease through genetic improvement.

- Genetics and mapping of charcoal rot resistance-USB Project #8245.