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M. D. Simons and L. J. Michel[2]

Descriptions of the first 59 races of the crown rust fungus (Puccinia coronata Cda. var. avenae Fraser & Led.) identified on a revised set of 10 standard differential oat varieties were included in a compilation prepared by Simons and Murphy in 1955 (15). These races were numbered from 201 through 259, to avoid confusion with races previously identified on the old set of 13 differential varieties (15). Since that time races numbered 260 through 347, many of which are vitally important in breeding resistant oat varieties, have been identified. The investigators credited with first discovering these races are shown in Table 1. Descriptions of all races known to have been identified throughout the world on the 10 standard differential varieties are shown in Table 2. In the few cases where insufficient data were included in the published reports, additional information was obtained by correspondence. A key to facilitate rapid determination of unknown races is given in Table 3.

Table 1. Discoverers and countries of origin of crown rust races 260 through 347.

Race no.	Discoverer	Country	Ref.	Year published
260-263	Cenoz and Vallega	Argentina	(2)	1955
264	Wahl and Schreiter	Israel	(19)	1953
265-269	Lagos	Brazil	(7)	1955
270	Wahl	Israel	(16)	1954
271-275	Griffiths	England	(5)	1958
276-279	Cenoz and Vallega	Argentina	(2)	1955
280-285	Simons	United States	(8)	1955
286	Baker and Upadhyaya	Australia	(1)	1956
287	Cenoz and Vallega	Argentina	(2)	1955
288	Lagos	Brazil	(8)	1955
289	Cruickshank	New Zealand	(3)	1956
290	Simons, et al.	United States	(10)	1957
291-292	Cenoz	Argentina	(9)	1957
293	Peturson	Canada	(9)	1957
294-295	Simons and Michel	United States	(11)	1958
296	Peturson	Canada	(11)	1958
297	Gustavsson	Sweden	(6)	1959
298-299	Simons and Michel	United States	(12)	1959
300-310	Wahl, et al.	Israel	(18)	1960
311-319	Wahl	Israel	(17)	1959
320	Simons and Michel	United States	(13)	1960
321-325	Simons and Michel	United States	(14)	1961
326-329	Simons and Michel	United States	-	Not published
330-331	Leijestram	Sweden	-	Not published
332	Fleischmann	Canada	(4)	1963
333-337	Simons and Michel	United States	-	Not published
338-343	Fleischmann	Canada	-	Not published
344-347	Simons and Michel	United States	-	Not published

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[2]Pathologist and Research Technician, respectively, Crops Research Division, Agricultural Research Service, United States Department of Agriculture.

Table 2. Average reactions[a] of ten standard differential varieties of oats to races of the crown rust fungus (*Puccinia coronata* var. *avenae*).

Race	Anthony	Victoria	Appler	Bond	Landhafer	Santa Fe	Ukraine	Trispernia	Bondvic	Saia
201	R	R	S	S	R	R	R	R	R	R
202	S	R	S	S	R	R	R	R	R	R
203	S	R	S	S	R	R	S	R	R	R
204	R	R	S	S	R	R	S	R	S	S
205	S	R	S	S	R	R	R	R	R	S
206	S	R	S	S	R	R	R	R	S	R
207	S	R	S	S	R	R	S	R	S	R
208	S	R	S	S	R	R	S	R	S	S
209	R	R	R	S	R	R	R	R	R	R
210	R	R	R	S	R	R	S	R	R	R
211	R	R	S	S	R	R	S	R	R	R
212	S	R	R	S	R	R	R	R	R	R
213	S	S	S	S	R	R	R	R	R	R
214	S	S	S	S	R	R	R	R	R	S
215	S	S	S	S	R	R	R	R	S	R
216	S	S	S	S	R	R	S	R	R	R
217	S	S	S	S	R	R	S	R	S	R
218	S	S	S	S	R	R	R	S	R	R
219	S	S	S	S	R	R	S	S	R	R
220	S	R	S	S	R	R	R	S	R	R
221	S	R	S	S	R	R	R	R	S	R
222	S	R	S	S	R	R	S	S	R	R
223	S	R	S	S	R	R	S	S	R	S
224	S	R	S	S	R	R	S	S	S	R
225	S	R	S	R	R	R	R	S	R	R
226	S	R	S	R	R	R	S	R	R	R
227	S	R	S	R	R	R	S	R	R	S
228	R	R	R	R	R	R	S	R	R	R
229	R	R	R	R	R	R	S	R	R	S
230	R	R	S	R	R	R	S	R	R	R
231	S	R	R	R	R	R	S	R	R	R
232	S	R	R	R	R	R	S	R	R	S
233	S	R	S	R	R	R	R	R	S	R
234	R	R	R	R	R	R	R	R	R	S
235	S	R	R	R	R	R	R	R	R	S
236	S	R	S	R	R	R	R	R	R	S
237	S	R	S	R	R	R	R	R	R	R
238	R	R	S	R	R	R	R	R	R	R
239	R	R	R	R	R	R	R	R	R	R
240	S	R	R	R	R	R	R	R	R	R
241	S	R	S	S	R	R	S	R	R	S
242	S	R	S	S	R	R	R	S	S	
243	S	R	S	R	R	R	S	S	S	
244	S	R	S	R	R	R	S	S	R	
245	R	R	S	S	R	R	S	I	R	
246	R	R	S	R	R	R	S	I	S	
247	R	R	S	S	R	R	S	S	R	
248	S	R	S	R	R	S	S	S	S	
249	R	R	S	R	R	R	S	S	R	
250	S	R	S	S	R	R	S	R	S	
251	R	R	S	S	R	R	R	R	R	S
252	S	R	S	S	R	R	S	S	S	
253	S	S	S	S	R	R	S	S	R	
254	R	R	S	R	R	S	S	I	R	
255	S	R	S	R	R	R	S	S	R	
256	S	R	S	S	S	R	R	R	S	
257	S	R	S	S	R	I	R	R	R	
258	S	S	S	R	R	R	R	R	R	
259	S	S	S	R	R	R	S	R	R	
260	S	R	S	R	S	R	R	R	R	
261	S	R	S	R	S	S	R	R	R	
262	S	R	S	S	S	S	S	S	S	
263	S	R	S	S	S	S	R	S	S	
264	S	S	S	S	S	S	S	S	S	R
265	R	R	S	S	S	S	R	S	S	
266	R	R	S	R	R	R	S	R	S	R
267	R	R	S	R	R	R	R	S	S	
268	S	R	S	R	R	R	S	R	S	R
269	S	S	S	R	R	R	S	S	S	R
270	S	S	S	R	S	S	S	S	S	R
271	S	R	R	R	R	R	S	I	R	S
272	R	R	S	R	R	R	S	R	R	S
273	I	R	S	R	R	R	S	S	R	S
274	R	S	S	S	R	R	S	R	R	R
275	R	R	S	S	R	R	S	R	R	S
276	S	R	S	S	S	S	S	S	S	R
277	S	R	S	R	S	S	R	S	S	R
278	R	R	S	R	S	S	S	S	S	R
279	R	S	S	S	R	R	R	R	R	R
280	S	R	R	S	R	R	R	R	R	S
281	S	R	R	S	R	R	S	R	R	S
282	R	S	S	R	R	R	R	R	R	R
283	R	S	S	R	R	R	S	R	R	R
284	S	R	R	S	R	R	S	R	R	R
285	S	S	R	S	R	R	R	R	R	R
286	S	R	S	R	S	S	S	S	S	R
287	R	R	S	R	S	S	R	S	S	R
288	S	R	S	R	R	R	S	R	S	S
289	R	R	S	R	R	R	R	R	R	S
290	S	R	S	S	S	S	R	R	R	R
291	R	S	S	R	R	R	I	I	R	
292	S	S	S	R	R	R	I	I	R	
293	R	R	S	S	S	S	R	R	R	R
294	R	R	S	S	S	S	S	R	R	R
295	S	R	S	S	S	S	S	R	R	R
296	R	R	R	S	R	R	R	R	R	S
297	R	S	R	R	R	S	R	R	R	R
298	S	R	R	S	S	R	R	R	R	R
299	S	S	R	R	R	S	R	R	R	R
300	S	R	R	S	R	S	R	S	S	R
301	S	R	R	S	R	S	S	S	S	R
302	S	R	S	S	I	R	R	S	S	R
303	S	S	S	R	R	S	R	S	S	R
304	S	R	S	S	R	S	S	S	S	R
305	S	S	S	R	S	S	R	S	S	R
306	S	R	R	R	R	R	R	S	S	R
307	S	R	R	S	R	R	R	S	S	R
308	S	R	S	S	I	S	R	R	S	R
309	S	S	S	S	S	S	S	S	R	R
310	S	R	R	R	R	S	S	R	S	R
311	S	R	S	S	S	S	S	R	S	R
312	R	R	R	S	R	S	S	R	S	R
313	R	S	S	S	R	S	S	S	S	R
314	S	R	S	S	S	S	R	R	S	R
315	S	R	S	R	R	S	R	R	R	R
316	S	S	S	S	R	S	S	S	S	R
317	I	R	S	R	R	S	R	R	S	R
318	S	R	R	R	R	S	S	S	S	R
319	S	S	S	R	R	S	S	R	S	R
320	S	S	R	S	R	R	S	R	R	R
321	S	R	S	S	S	S	R	R	R	S
322	S	R	R	S	S	R	S	R	R	R
323	S	R	S	S	S	R	R	R	R	R
324	S	S	R	S	R	R	S	R	R	S
325	S	S	S	S	S	S	R	S	S	R
326	S	S	S	S	S	S	S	R	R	R
327	S	S	S	S	S	S	R	R	R	R
328	R	R	R	S	S	R	R	R	S	R
329	S	R	R	S	S	S	R	R	R	S
330	R	R	R	S	R	R	S	R	R	S
331	R	R	I	R	S	S	S	S	S	R
332	S	S	S	S	R	R	S	R	R	S
333	S	R	S	S	S	S	S	R	R	S
334	S	R	R	S	S	S	R	R	R	R
335	S	R	S	S	S	R	S	R	R	R
336	S	S	S	S	S	R	R	R	R	R
337	S	R	R	S	S	S	S	R	R	R
338	R	S	S	S	S	S	S	R	R	R
339	R	S	S	S	S	S	R	R	R	R
340	R	S	R	S	R	R	R	R	R	S
341	R	S	R	S	R	R	S	R	R	R
342	R	S	R	S	R	R	S	R	R	S
343	S	S	R	R	R	S	R	R	S	S
344	S	R	S	R	S	S	R	R	R	S
345	S	S	S	S	S	S	S	R	R	S
346	S	S	R	S	S	R	R	R	R	R
347	S	R	R	S	S	R	R	R	R	S

[a] "R" indicates that the variety is resistant (infection types I, O, 1, and 2) to the race; "I" indicates that the reaction of the variety to the race cannot be clearly classified as resistant or as susceptible; "S" (infection types 3 and 4) indicates susceptibility.

Table 3. Descriptive formulas and key for races of crown rust identified using ten standard differential varieties of oats.

Race	Formula[a]	Race	Formula[a]	Race	Formula[a]
239	1,2,3,4,5,6,7,8,9,10	251	1,2,5,6,7,8,9	232	2,3,4,5,6,8,9
234	1,2,3,4,5,6,7,8,9	245	1,2,5,6,7,(9),10	271	2,3,4,5,6,(8),9
228	1,2,3,4,5,6,8,9,10	211	1,2,5,6,8,9,10	310	2,3,4,5,8,10
229	1,2,3,4,5,6,8,9	275	1,2,5,6,8,9	318	2,3,4,5,6,10
331	1,2,(3),4,10	204	1,2,5,6,8	212	2,3,5,6,7,8,9,10
209	1,2,3,5,6,7,8,9,10	247	1,2,5,6,10	280	2,3,5,6,7,8,9
296	1,2,3,5,6,7,8,9	293	1,2,7,8,9,10	307	2,3,5,6,7,10
210	1,2,3,5,6,8,9,10	265	1,2,7,10	284	2,3,5,6,8,9,10
330	1,2,3,5,6,8,9	294	1,2,8,9,10	281	2,3,5,6,8,9
312	1,2,3,5,8,10	297	1,3,4,5,6,8,9,10	300	2,3,5,7,10
328	1,2,3,6,7,8,10	340	1,3,5,6,7,8,9	301	2,3,5,10
238	1,2,4,5,6,7,8,9,10	342	1,3,5,6,8,9	298	2,3,6,7,8,9,10
289	1,2,4,5,6,7,8,9	341	1,3,5,6,8,9,10	347	2,3,6,7,8,9
246	1,2,4,5,6,7,(9)	282	1,4,5,6,7,8,9,10	322	2,3,6,8,9,10
249	1,2,4,5,6,7,10	291	1,4,5,6,7,(8),(9),10	334	2,3,7,8,9,10
267	1,2,4,5,6,7	283	1,4,5,6,8,9,10	329	2,3,7,8,9
230	1,2,4,5,6,8,9,10	279	1,5,6,7,8,9,10	337	2,3,8,9,10
272	1,2,4,5,6,8,9	274	1,5,6,8,9,10	237	2,4,5,6,7,8,9,10
266	1,2,4,5,6,8,10	313	1,5,10	236	2,4,5,6,7,8,9
254	1,2,4,5,6,(9),10	339	1,7,8,9,10	233	2,4,5,6,7,8,10
273	(1),2,4,5,6,9	338	1,8,9,10	225	2,4,5,6,7,9,10
317	(1),2,4,5,7,8,10	240	2,3,4,5,6,7,8,9,10	255	2,4,5,6,7,9
287	1,2,4,7,10	235	2,3,4,5,6,7,8,9	244	2,4,5,6,7,10
278	1,2,4,10	306	2,3,4,5,6,7,10	243	2,4,5,6,7
201	1,2,5,6,7,8,9,10	231	2,3,4,5,6,8,9,10	226	2,4,5,6,8,9,10
227	2,4,5,6,8,9	222	2,5,6,9,10	292	4,5,6,7,(8),(9),10
268	2,4,5,6,8,10	223	2,5,6,9	259	4,5,6,8,9,10
288	2,4,5,6,8	224	2,5,6,10	269	4,5,6,10
248	2,4,5,6	308	2,(5),7,8,10	303	4,5,7,10
315	2,4,5,7,8,9,10	304	2,5,10	319	4,5,8,10
260	2,4,6,7,8,9,10	323	2,6,7,8,9,10	305	4,7,10
261	2,4,7,8,9,10	256	2,6,7,8,9	270	4,10
344	2,4,7,8,9	335	2,6,8,9,10	213	5,6,7,8,9,10
277	2,4,7,10	290	2,7,8,9,10	214	5,6,7,8,9
286	2,4,10	321	2,7,8,9	215	5,6,7,8,10
202	2,5,6,7,8,9,10	314	2,7,8,10	218	5,6,7,9,10
257	2,5,(6),7,8,9,10	263	2,7,10	253	5,6,7,10
205	2,5,6,7,8,9	295	2,8,9,10	216	5,6,8,9,10
206	2,5,6,7,8,10	333	2,8,9	332	5,6,8,9
242	2,5,6,7,8	311	2,8,10	217	5,6,8,10
220	2,5,6,7,9,10	276	2,10	219	5,6,9,10
250	2,5,6,7,9	262	2	316	5,10
221	2,5,6,7,10	299	3,4,5,6,8,9,10	336	6,7,8,9,10
302	2,(5),6,7,10	343	3,4,5,6,8,9	327	7,8,9,10
252	2,5,6,7	285	3,5,6,7,8,9,10	325	7,10
203	2,5,6,8,9,10	320	3,5,6,8,9,10	326	8,9,10
241	2,5,6,8,9	324	3,5,6,8,9	345	8,9
207	2,5,6,8,10	346	3,6,7,8,9,10	309	9,10
208	2,5,6,8	258	4,5,6,7,8,9,10	264	10

[a]Numbers refer to the varieties as they appear below. The varieties represented by the numbers in a particular race formula are resistant to that race except those indicated by numbers in parentheses, which represent varieties that exhibit an intermediate reaction. 1. Anthony, 2. Victoria, 3. Appler, 4. Bond, 5. Landhafer, 6. Santa Fe, 7. Ukraine, 8. Trispernia, 9. Bondvic, and 10. Saia.

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CROPS RESEARCH DIVISION, AGRICULTURAL RESEARCH SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE AND IOWA AGRICULTURAL AND HOME ECONOMICS EXPERIMENT STATION, AMES, IOWA