

Primer3 Output

PRIMER PICKING RESULTS FOR Puccinia_recondita_consensus_consensus_group_1

Template masking not selected
No mispriming library specified
No internal oligo mishyb library specified
Using 1-based sequence positions

OLIGO	start	len	tm	gc%	any_th	3'_th	hairpin	seq
LEFT PRIMER	751	20	58.95	55.00	0.00	0.00	0.00	cgggaattggtatcggagga
RIGHT PRIMER	926	20	58.90	55.00	0.00	0.00	0.00	tgtcactgctaccgatcctc
INTERNAL OLIGO	821	20	60.39	55.00	0.00	0.00	0.00	gggaatgacatgctctggga

SEQUENCE SIZE: 1335
INCLUDED REGION SIZE: 1335

PRODUCT SIZE: 176, PAIR ANY_TH COMPL: 3.86, PAIR 3'_TH COMPL: 0.00

1 ttttaattcatcttgaatcgttctaatcgcttttcggcccggtgcctttaataataaaa

61 ttatacaaatcatcaaaaagactattcacaNctattttacacctatttacattttattata

121 caaattaaatcaataacaagattacaatcaatatgcagtaNtcatcggctatttctcattg

181 ctgcttttcgcagtNactagtgtctttacccatggagtcggttgattctgtcgaaggcgcca

241 atggagtcaccatgccgggtctctcagttgccgacggcaccgccgctgattgcgccagcc

301 ctcgctgcggatctgaggctgatacttctatcatccggaaacgtgagatgggaaccaaca

361 aggccactgcacttggtcgcactcagggcgggtggcccggtcgatgccactaagatgatgg

421 ccatgttcatgggaggtggcggcaatgctacagcgacaaaaggaagcacgggaagttcacg

481 cagccaacgtccttcgtcgaagtcttgagagcgtgcagccaatggaggaaccaagacgc

541 ctaagggcaccttggagactggtgtcaaggctgcagcNggagctggagcNNccagNggca

601 tgccgacttgctcggacgacggcaaggtcaagatgacctaccatcaaatcaaccaagatg

2	LEFT PRIMER	907	20	58.90	55.00	0.00	0.00	0.00	gaggatcggtagcagtgcaca
	RIGHT PRIMER	1099	20	59.26	55.00	0.00	0.00	0.00	gcacacctccttttcggcttc

INTERNAL OLIGO 967 20 59.54 50.00 0.00 0.00 40.03 tatcgaagcgtcactttgco
PRODUCT SIZE: 193, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00

LEFT PRIMER	527	20	59.39	55.00	0.00	0.00	0.00	aggaaccaagacgcctaagg
RIGHT PRIMER	725	20	58.90	50.00	0.00	0.00	0.00	tttgaatgctgctggatcgg
INTERNAL OLIGO	548	20	60.17	55.00	0.00	0.00	45.23	caccttgagactggtgtca
PRODUCT SIZE: 199, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00								

LEFT PRIMER	670	20	59.83	55.00	14.67	7.21	0.00	cattgacggccatggttgac
RIGHT PRIMER	840	20	59.45	55.00	0.00	0.00	0.00	tcccagagcatgtcattccc
INTERNAL OLIGO	751	20	59.88	55.00	0.00	0.00	0.00	cggaattggtatcggaggaa
PRODUCT SIZE: 171, PAIR ANY_TH COMPL: 7.83, PAIR 3'_TH COMPL: 0.00								

LEFT PRIMER	710	20	58.90	50.00	0.00	0.00	0.00	tccagcagcattcaaattcgg
RIGHT PRIMER	871	21	59.34	47.62	12.42	12.42	0.00	acaattgcatacgttctgagc
INTERNAL OLIGO	751	20	59.88	55.00	0.00	0.00	0.00	cgggaattgggtatcggaggaa
PRODUCT SIZE: 162, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00								

LEFT PRIMER	726	20	58.05	45.00	28.99	0.00	0.00	tcggccgaagtaacacaaaa
RIGHT PRIMER	919	20	58.12	55.00	0.00	0.00	0.00	gctaccgatcctccaaatgg
INTERNAL OLIGO	751	20	59.88	55.00	0.00	0.00	0.00	cgggaattggtatcggagga
PRODUCT SIZE: 194, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00								

LEFT PRIMER	171	20	57.44	45.00	0.00	0.00	0.00	attcttcattgctgcttttcgc
RIGHT PRIMER	356	20	58.55	55.00	0.00	0.00	0.00	ggttcccatctcacggtttcc
INTERNAL OLIGO	305	20	59.96	55.00	5.99	0.00	0.00	ctgcggatctgaggctgata
PRODUCT SIZE: 186, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00								

13	LEFT PRIMER	558	18	59.08	55.56	0.50	0.00	0.00	actggtgtcaaggctgca
	RIGHT PRIMER	729	20	58.90	50.00	0.00	0.00	0.00	ccgatttgaatgctgctgga
	INTERNAL OLIGO	618	20	59.82	55.00	2.44	2.44	46.75	gacggcaaggtcaagatgac
	PRODUCT SIZE: 172, PAIR ANY_TH COMPL: 0.63, PAIR 3'_TH COMPL: 0.63								
14	LEFT PRIMER	745	20	58.02	50.00	2.18	0.00	0.00	atgtgccgggaattggtatc
	RIGHT PRIMER	936	19	59.34	57.89	4.27	6.14	0.00	ctgggctttgtgtcactgc
	INTERNAL OLIGO	821	20	60.39	55.00	0.00	0.00	0.00	gggaatgacatgctctggga
	PRODUCT SIZE: 192, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00								
15	LEFT PRIMER	796	21	58.97	52.38	0.00	0.00	0.00	tcccggtagaagtacagatgc
	RIGHT PRIMER	959	20	57.66	50.00	0.00	0.00	0.00	ctcaatggcacgtttcttgg
	INTERNAL OLIGO	915	20	60.03	55.00	9.05	0.27	0.00	gtagcagtgcacaaaagccc
	PRODUCT SIZE: 164, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00								
16	LEFT PRIMER	397	20	58.51	55.00	0.00	0.00	0.00	cggtcgatgccactaagatg
	RIGHT PRIMER	575	18	59.08	55.56	0.00	0.00	0.00	tgcagccttgacaccagt
	INTERNAL OLIGO	455	20	60.03	55.00	0.00	0.00	0.00	gacaaaggaagcacgggaag
	PRODUCT SIZE: 179, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00								
17	LEFT PRIMER	757	20	57.77	50.00	10.38	0.00	0.00	ttggtatcggaggactgtca
	RIGHT PRIMER	929	20	57.64	50.00	4.27	0.00	0.00	ttgtgtcactgctaccgatc
	INTERNAL OLIGO	821	20	60.39	55.00	0.00	0.00	0.00	gggaatgacatgctctggga
	PRODUCT SIZE: 173, PAIR ANY_TH COMPL: 3.86, PAIR 3'_TH COMPL: 0.42								
18	LEFT PRIMER	369	18	58.75	61.11	0.00	0.00	0.00	gcacttggtcgcactcag
	RIGHT PRIMER	546	20	59.39	55.00	0.00	0.00	0.00	ccttaggcgtcttggttcct
	INTERNAL OLIGO	455	20	60.03	55.00	0.00	0.00	0.00	gacaaaggaagcacgggaag
	PRODUCT SIZE: 178, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00								
19	LEFT PRIMER	308	22	59.11	50.00	0.00	0.00	0.00	cggatctgaggctgatacttct
	RIGHT PRIMER	478	20	59.53	50.00	0.00	0.00	0.00	tgaacttcccgtgcttcctt
	INTERNAL OLIGO	415	20	60.32	50.00	27.29	0.00	42.44	tgatggccatgttcatggga
	PRODUCT SIZE: 171, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00								
20	LEFT PRIMER	915	20	59.12	55.00	8.59	0.00	0.00	gtagcagtgcacaaaagccc
	RIGHT PRIMER	1100	18	58.49	61.11	0.00	0.00	0.00	ggcatcctccttttcggc
	INTERNAL OLIGO	967	20	59.54	50.00	0.00	0.00	40.03	tatcgaagcgtcactttgcc
	PRODUCT SIZE: 186, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00								
21	LEFT PRIMER	455	20	59.12	55.00	0.00	0.00	0.00	gacaaaggaagcacgggaag
	RIGHT PRIMER	636	19	57.47	52.63	0.00	0.00	0.00	tcatcttgaccttgccgtc
	INTERNAL OLIGO	548	20	60.17	55.00	0.00	0.00	45.23	caccttgagactgggtgtca
	PRODUCT SIZE: 182, PAIR ANY_TH COMPL: 7.01, PAIR 3'_TH COMPL: 7.01								
22	LEFT PRIMER	937	20	59.69	50.00	0.00	0.00	0.00	ctgccaagaaacgtgccatt
	RIGHT PRIMER	1134	21	57.88	47.62	0.00	0.00	0.00	cttcagcactcttcttggtca
	INTERNAL OLIGO	1080	20	60.17	55.00	0.00	0.00	45.42	gaagccgaaaaggaggatgc
	PRODUCT SIZE: 198, PAIR ANY_TH COMPL: 28.18, PAIR 3'_TH COMPL: 24.14								
23	LEFT PRIMER	803	20	59.82	55.00	0.00	0.00	0.00	agaagtacagatgccagcgg

	RIGHT PRIMER	963	21	57.88	42.86	0.00	0.00	0.00	tgtactcaatggcacgtttct
	INTERNAL OLIGO	915	20	60.03	55.00	9.05	0.27	0.00	gtagcagtgacacaaagccc
	PRODUCT SIZE: 161,	PAIR ANY_TH	COMPL: 0.00,	PAIR 3'_TH	COMPL: 2.05				
24	LEFT PRIMER	1114	21	57.88	47.62	0.00	0.00	0.00	tgaccaagaagagtgctgaag
	RIGHT PRIMER	1291	20	59.83	55.00	0.00	0.00	0.00	tcggtctctgcgtctaaagc
	INTERNAL OLIGO	1177	20	60.02	50.00	0.00	0.00	41.26	ttggatcagcgaccaaggat
	PRODUCT SIZE: 178,	PAIR ANY_TH	COMPL: 0.00,	PAIR 3'_TH	COMPL: 0.00				
25	LEFT PRIMER	1121	22	58.73	45.45	0.00	0.00	0.00	gaagagtgcctgaagatgatgca
	RIGHT PRIMER	1294	20	59.83	55.00	0.00	0.00	0.00	gcttcggtctctgcgtctaa
	INTERNAL OLIGO	1177	20	60.02	50.00	0.00	0.00	41.26	ttggatcagcgaccaaggat
	PRODUCT SIZE: 174,	PAIR ANY_TH	COMPL: 13.64,	PAIR 3'_TH	COMPL: 0.00				
26	LEFT PRIMER	207	21	59.09	47.62	15.22	0.00	0.00	acccatggagtcgttgattct
	RIGHT PRIMER	386	18	58.75	61.11	0.00	0.00	0.00	ctgagtgcgaccaagtgc
	INTERNAL OLIGO	305	20	59.96	55.00	5.99	0.00	0.00	ctgcggatctgaggctgata
	PRODUCT SIZE: 180,	PAIR ANY_TH	COMPL: 0.00,	PAIR 3'_TH	COMPL: 0.00				
27	LEFT PRIMER	821	20	59.45	55.00	0.00	0.00	0.00	gggaatgacatgctctggga
	RIGHT PRIMER	990	18	60.36	61.11	0.00	0.00	0.00	ctcgggcaaagtgcgct
	INTERNAL OLIGO	915	20	60.03	55.00	9.05	0.27	0.00	gtagcagtgacacaaagccc
	PRODUCT SIZE: 170,	PAIR ANY_TH	COMPL: 0.00,	PAIR 3'_TH	COMPL: 0.00				
28	LEFT PRIMER	753	21	57.89	52.38	0.00	0.00	0.00	ggaattggtatcggaggactg
	RIGHT PRIMER	951	19	59.72	57.89	17.12	0.00	0.00	cacgtttcttggcagctgg
	INTERNAL OLIGO	904	20	60.10	55.00	0.00	0.00	34.94	ttggaggatcggtagcagtg
	PRODUCT SIZE: 199,	PAIR ANY_TH	COMPL: 0.00,	PAIR 3'_TH	COMPL: 0.00				
29	LEFT PRIMER	301	18	59.97	66.67	23.03	0.00	0.00	ctcgtgcggatctgagg
	RIGHT PRIMER	480	19	59.14	57.89	0.00	0.00	0.00	cgtgaacttcccgtgcttc
	INTERNAL OLIGO	415	20	60.32	50.00	27.29	0.00	42.44	tgatggccatgttcatggga
	PRODUCT SIZE: 180,	PAIR ANY_TH	COMPL: 1.27,	PAIR 3'_TH	COMPL: 0.00				
30	LEFT PRIMER	260	18	59.04	61.11	10.29	10.29	0.00	tctctcagttgccgacgg
	RIGHT PRIMER	441	19	60.08	57.89	0.00	0.00	0.00	cgccacctcccatgaacat
	INTERNAL OLIGO	305	20	59.96	55.00	5.99	0.00	0.00	ctgcggatctgaggctgata
	PRODUCT SIZE: 182,	PAIR ANY_TH	COMPL: 0.00,	PAIR 3'_TH	COMPL: 4.43				
31	LEFT PRIMER	497	20	59.76	55.00	0.00	0.00	0.00	tcgaagtcttggagagcgtg
	RIGHT PRIMER	690	18	60.36	61.11	13.04	0.00	0.00	cgtcaacctggccgtca
	INTERNAL OLIGO	548	20	60.17	55.00	0.00	0.00	45.23	caccttggagactggtgtca
	PRODUCT SIZE: 194,	PAIR ANY_TH	COMPL: 0.00,	PAIR 3'_TH	COMPL: 0.00				
32	LEFT PRIMER	459	20	59.53	50.00	5.01	0.00	0.00	aaggaagcacgggaagttca
	RIGHT PRIMER	655	22	57.35	40.91	0.00	0.00	0.00	tggttgatttgatggttaggtca
	INTERNAL OLIGO	548	20	60.17	55.00	0.00	0.00	45.23	caccttggagactggtgtca
	PRODUCT SIZE: 197,	PAIR ANY_TH	COMPL: 0.00,	PAIR 3'_TH	COMPL: 0.00				
33	LEFT PRIMER	634	22	57.35	40.91	0.00	0.00	0.00	tgacctaccatcaaataacca
	RIGHT PRIMER	822	20	59.82	55.00	0.00	0.00	0.00	ccgctggcatctgtacttct
	INTERNAL OLIGO	751	20	59.88	55.00	0.00	0.00	0.00	cgggaattggtatcggagga

PRODUCT SIZE: 189, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00									
34	LEFT PRIMER	669	18	57.98	55.56	14.67	0.00	0.00	ccattgacggccatggtt
	RIGHT PRIMER	860	19	59.49	57.89	14.86	0.00	0.00	gttctgagcgtcgcctact
	INTERNAL OLIGO	751	20	59.88	55.00	0.00	0.00	0.00	cgggaattggtatcggagga
PRODUCT SIZE: 192, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00									
35	LEFT PRIMER	257	18	58.62	61.11	0.00	0.00	0.00	gggtctctcagttgccga
	RIGHT PRIMER	453	18	59.21	61.11	4.70	0.00	0.00	ctgtagcattgccgccac
	INTERNAL OLIGO	305	20	59.96	55.00	5.99	0.00	0.00	ctgcggatctgaggctgata
PRODUCT SIZE: 197, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00									
36	LEFT PRIMER	398	22	58.94	50.00	0.00	0.00	0.00	ggtcgatgccactaagatgatg
	RIGHT PRIMER	562	18	59.65	66.67	0.00	0.00	0.00	ccagtctccaaggtgcc
	INTERNAL OLIGO	455	20	60.03	55.00	0.00	0.00	0.00	gacaaaggaagcacgggaag
PRODUCT SIZE: 165, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00									
37	LEFT PRIMER	372	18	60.74	66.67	0.00	0.00	0.00	cttggtcgcactcagggc
	RIGHT PRIMER	532	19	59.11	57.89	0.50	0.00	0.00	gttcctccattggctgcac
	INTERNAL OLIGO	455	20	60.03	55.00	0.00	0.00	0.00	gacaaaggaagcacgggaag
PRODUCT SIZE: 161, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00									
38	LEFT PRIMER	212	21	59.12	47.62	0.00	0.00	0.00	tggagtcgttgattctgtcga
	RIGHT PRIMER	389	18	60.74	66.67	0.00	0.00	0.00	gccctgagtgcgaccaag
	INTERNAL OLIGO	305	20	59.96	55.00	5.99	0.00	0.00	ctgcggatctgaggctgata
PRODUCT SIZE: 178, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00									
39	LEFT PRIMER	250	18	59.50	66.67	2.18	0.00	0.00	ccatgccgggtctctcag
	RIGHT PRIMER	420	21	57.61	47.62	0.00	0.00	0.00	ccatcatcttagtggcatcga
	INTERNAL OLIGO	305	20	59.96	55.00	5.99	0.00	0.00	ctgcggatctgaggctgata
PRODUCT SIZE: 171, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 1.92									
40	LEFT PRIMER	38	22	57.08	40.91	0.00	0.00	0.00	gcccgggtgcctttaataataaa
	RIGHT PRIMER	227	21	59.09	47.62	13.02	8.85	0.00	agaatcaacgactccatgggt
	INTERNAL OLIGO	172	20	59.67	45.00	0.00	0.00	45.94	ttctcattgctgctttcgca
PRODUCT SIZE: 190, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00									
41	LEFT PRIMER	636	23	57.74	39.13	0.00	0.00	0.00	acctaccatcaaatacaaccaaga
	RIGHT PRIMER	816	21	58.97	52.38	6.32	0.00	0.00	gcatctgtacttctaccggga
	INTERNAL OLIGO	751	20	59.88	55.00	0.00	0.00	0.00	cgggaattggtatcggagga
PRODUCT SIZE: 181, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00									
42	LEFT PRIMER	231	18	58.50	61.11	31.54	0.00	0.00	gaaggcgccaatggagtc
	RIGHT PRIMER	411	18	61.85	66.67	6.32	0.00	0.00	tagtggcatcgaccgggc
	INTERNAL OLIGO	305	20	59.96	55.00	5.99	0.00	0.00	ctgcggatctgaggctgata
PRODUCT SIZE: 181, PAIR ANY_TH COMPL: 0.00, PAIR 3'_TH COMPL: 0.00									

Statistics															
	con	too	in	in	not		no	tm	tm	high	high	high		high	
	sid	many	tar	excl	ok	bad	GC	too	too	any_th	3'_th	hair-	poly	end	
	ered	Ns	get	reg	reg	GC%	clamp	low	high	compl	compl	pin	X	stab	ok
Left	5882	235	0	0	0	862	0	1082	1948	0	0	641	22	0	1087

Right	5889	235	0	0	0	444	0	1262	1954	0	0	557	20	0	1411
Intl	10729	282	0	0	0	524	0	1536	5590	0	0	235	22	0	2540

Pair Stats:
considered 848287, unacceptable product size 848236, primer in pair overlaps a primer in a better pair 461481, ok 51
libprimer3 release 2.4.0

(primer3_results.cgi release 4.1.0)