**SUPPLEMENTARY DATA**
Esmenjaud, D., Banora, M. Y., Julien-Portier, U. , Lafargue, M. D-D., Tandonnet, J-P., Rubio, B., Walker, A., Van Ghelder, C. & Ollat, N. (2023). A muscadine locus confers resistance to predominant species of grapevine root-knot nematodes (*Meloidogyne* spp.) including virulent populations. OENO One, 57(3). Retrieved from https://oeno-one.eu/article/view/7443

# Supplementary data

**FIGURE S1.** Preliminary detection of markers of the RKN R factor from a BSA approach using SSRs and 15 segregating individuals (10 susceptible (S) and 5 resistant ((R) individuals) from the progeny VRH8771 x CS. The four polymorphic markers MRBX-08, VVIN16, VMC7F2 and UDV-108 carry R alleles from VRH8771 and are located on chromosome 18. Recombination points (yellow/white) are shown for the appropriate individuals.

| | | | Parents | | Hybrids | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SSR marker** | **Nbr of alleles** | **R allele** | **VRH8771** | **CS** | **14** | **37** | **85** | **207** | **21** | **248** | **232** | **227** | **228** | **234** | **17** | **239** | **233** | **244** | **246** |
| **MRBX-08** | abc | a | ab | bc | bb | cb | bb | bb | cb | bb | bb | ca | ca | ca | ba | ca | cb | bb | cb |
| **Phenotype** | | | **R** | **S** | **S** | **S** | **S** | **S** | **S** | **S** | **S** | **R** | **R** | **R** | **R** | **R** | **S** | **S** | **S** |
| **VVIN16** | ab | b | ab | aa | aa | aa | aa | aa | aa | aa | ab | ab | ab | ab | ab | ab | aa | aa | aa |
| **VMC7F2** | ab | a | ab | bc | bb | bc | bb | bb | bc | ac | ac | ac | ab | ac | ab | bc | bc | bb | bc |
| **UDV-108** | abc | a | ab | cb | bb | cb | cb | cb | ac | ac | ac | ac | ab | ab | bb | cb | cb | bb | bb |

**SUPPLEMENTARY DATA**
Author, N., Author, N., & Author, N. (2023). Lorem ipsum. *OENO One*, *57*(3).
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# Supplementary data

**FIGURE S2**. Location of the RKN R factor from 38 common individuals evaluated to the isolates of *M arenaria* (MA), *M. incognita* (MI) and *M. javanica* (MJ) in the progeny VRH8771 x CS. The interval containing the R factor is shown in orange from the recombination points (yellow/white). The first row (Ind.) corresponds to the identity of the individuals phenotyped and the third column indicates le SNP physical marker position on chromosome 18. The location of the telomeric R QTL *XiR4* for resistance to *X. index* (Rubio *et al*., 2020) is indicated in grey.

| | Chrom # | SNP location | Ind. | 248 | 14 | 21 | 82 | 207 | 225 | 233 | 235 | 238 | 37 | 236 | 42 | 239 | 273 | 17 | 1 | 28 | 33 | 227 | 228 | 234 | 250 | 263 | 270 | 277 | 281 | 306 | 232 | 4 | 240 | 244 | 246 | 247 | 262 | 267 | 271 | 279 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 18 | 17426552 | | GG | GG | GG | GG | GG | GG | GG | GG | GG | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GA |
| | 18 | 18022555 | | AA | AA | AA | AA | AA | AA | AA | AA | .. | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AA | AA | AA | AA | AA | AA | AA | AA | AA | AA | AG |
| | 18 | 18034394 | | TT | TT | TT | TT | TT | TT | TT | TT | TT | TA | TA | TA | TA | TA | TA | TA | TA | TA | TA | .. | TA | TA | TA | TA | TA | TA | TA | TT | .. | TT | TT | TT | TT | TT | TT | TT | TT | TA |
| | 18 | 18034398 | | TT | TT | TT | TT | TT | TT | TT | TT | TT | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | .. | TC | TC | TC | TC | TC | TC | TC | TT | .. | TT | TT | TT | TT | TT | TT | TT | .. | TC |
| | 18 | 18860621 | | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GT | GT | GT | GT | GT | GT | GT | GT | GT | GT | GT | GT | GT | GT | GT | GT | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG |
| | 18 | 18860622 | | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GC | GC | GC | GC | GC | GC | GC | GC | GC | GC | GC | GC | GC | GC | GC | GC | GG | GG | GG | .. | GG | GG | GG | GG | GG | GG | GG | GG |
| | 18 | 19597480 | | AA | AA | AA | AA | AA | AA | AA | AA | AA | AA | AA | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AA | .. | AA | AA | AA | AA | AA | AA | AA | AA | AA | AA |
| | 18 | 19597501 | | AA | AA | AA | AA | AA | AA | AA | AA | AA | AA | AA | AC | AC | AC | AC | AC | AC | AC | AC | AC | AC | AC | AC | AC | AC | AC | AC | AA | .. | AA | AA | AA | AA | AA | AA | AA | AA | AA | AA |
| | | Phenotype | | S | S | S | S | S | S | S | S | S | S | S | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | S | S | S | S | S | S | S | S | S | S | S |
| Interval containing the RKN R factor | 18 | 19640777 | | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GG | .. | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG |
| | 18 | 20046591 | | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GC | GC | GC | GC | GC | GC | GC | GC | GC | GC | GC | GC | GC | GC | GC | GC | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG |
| | 18 | 20521007 | | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GA | GA | GA | GA | GA | GA | GA | GA | .. | GA | GA | GA | GA | GA | GA | GA | GG | .. | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG |
| | 18 | 20759950 | | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT |
| | 18 | 20759971 | | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT |
| | 18 | 20759977 | | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG |
| | 18 | 20836663 | | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TT | .. | TT | TT | TT | TT | TT | TT | TT | .. | TT |
| | 18 | 20836679 | | AA | AA | AA | AA | AA | AA | AA | AA | AA | AA | AA | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AA | .. | AA | AA | AA | AA | AA | AA | AA | .. | AA |
| | 18 | 20935373 | | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT |
| | 18 | 23400980 | | GG | GG | GG | GG | GG | GG | GG | GG | GG | .. | GG | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GG | GG | GG | GG | GG | GG | GG | GG | .. | GG |
| | 18 | 23400989 | | CC | CC | CC | CC | CC | CC | CC | CC | CC | CC | CC | CA | CA | CA | CA | CA | CA | CA | CA | CA | CA | CA | CA | CA | CA | CA | CA | CC | CC | CC | CC | CC | CC | CC | CC | .. | CC |
| | 18 | 23400990 | | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TT | TT | TT | TT | TT | TT | TT | TT | .. | TT |
| | 18 | 27927782 | | GA | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG |
| *XiR4* QTL interval | 18 | 27927785 | | TA | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TA | TA | TA | TA | TA | TA | TA | TA | TA | TA | TA | TA | TA | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT |
| | 18 | 29069289 | | TC | TT | TC | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | .. | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TC | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT |
| | 18 | 29189442 | | GA | GG | GA | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GA | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG |

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Author, N., Author, N., & Author, N. (2023). Lorem ipsum. *OENO One*, *57*(3).
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**TABLE S1.** Distribution of the segregating individuals of the progeny VRH8771 x CS using the gall index (GI: 0-5) rating criterion for resistance to an isolate of M. incognita (MI). Gall index values followed by the same uppercase letter do not differ according to the Fischer multiple range test at $P < 0.05$. The horizontal line separates the S and R plant individuals.

| Plant material | Gall index | Groups | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CS | 4.5 | A | | | | | | | | | |
| 207 | 4.3 | A | B | | | | | | | | |
| RL | 4.2 | A | B | | | | | | | | |
| 48 | 4.0 | A | B | C | | | | | | | |
| 246 | 3.9 | A | B | C | D | | | | | | |
| 31 | 3.8 | A | B | C | D | E | | | | | |
| 240 | 3.8 | A | B | C | D | E | | | | | |
| 4 | 3.5 | | B | C | D | E | F | | | | |
| 262 | 3.5 | | B | C | D | E | F | | | | |
| 247 | 3.5 | | B | C | D | E | F | | | | |
| 267 | 3.3 | | | C | D | E | F | G | | | |
| 68 | 3.1 | | | | D | E | F | G | H | | |
| 236 | 3.0 | | | | | E | F | G | H | I | |
| 21 | 3.0 | | | | | E | F | G | H | I | |
| 279 | 2.9 | | | | | | F | G | H | I | |
| 271 | 2.8 | | | | | | F | G | H | I | |
| 85 | 2.8 | | | | | | F | G | H | I | |
| 233 | 2.6 | | | | | | | G | H | I | |
| 248 | 2.6 | | | | | | | G | H | I | |
| 37 | 2.6 | | | | | | | G | H | I | |
| 82 | 2.6 | | | | | | | G | H | I | |
| 237 | 2.5 | | | | | | | G | H | I | |
| 14 | 2.4 | | | | | | | | H | I | |
| 244 | 2.4 | | | | | | | | H | I | |
| 238 | 2.3 | | | | | | | | | I | |
| 232 | 2.3 | | | | | | | | | I | |
| 235 | 2.3 | | | | | | | | | I | |
| 225 | 2.2 | | | | | | | | | I | |
| NAB | 0.7 | | | | | | | | | | J |
| 28 | 0.5 | | | | | | | | | | J |
| 251 | 0.1 | | | | | | | | | | J |
| 42 | 0.1 | | | | | | | | | | J |
| 281 | 0.0 | | | | | | | | | | J |
| 1 | 0.0 | | | | | | | | | | J |
| 270 | 0.0 | | | | | | | | | | J |
| 277 | 0.0 | | | | | | | | | | J |
| 228 | 0.0 | | | | | | | | | | J |
| VRH8624 | 0.0 | | | | | | | | | | J |
| 93 | 0.0 | | | | | | | | | | J |
| 17 | 0.0 | | | | | | | | | | J |
| 227 | 0.0 | | | | | | | | | | J |
| 234 | 0.0 | | | | | | | | | | J |
| 250 | 0.0 | | | | | | | | | | J |
| 266 | 0.0 | | | | | | | | | | J |
| 273 | 0.0 | | | | | | | | | | J |
| 306 | 0.0 | | | | | | | | | | J |
| 33 | 0.0 | | | | | | | | | | J |
| VRH8771 | 0.0 | | | | | | | | | | J |
| 263 | 0.0 | | | | | | | | | | J |
| 239 | 0.0 | | | | | | | | | | J |

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**TABLE S2.** Distribution of the segregating individuals of the progeny VRH8771 x CS using the gall index (GI: 0-5) rating criterion for resistance to an isolate of M. incognita (MI). Gall index values followed by the same uppercase letter do not differ according to the Fischer multiple range test at $P < 0.05$. The horizontal line separates the S and R plant individuals.

| Plant material | Gall index | Groups | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 48 | 4.4 | A | | | | | | | | | | |
| CS | 4.4 | A | | | | | | | | | | |
| 240 | 4.1 | A | B | | | | | | | | | |
| 207 | 4.0 | A | B | | | | | | | | | |
| 82 | 4.0 | A | B | | | | | | | | | |
| 4 | 3.8 | | B | | | | | | | | | |
| 262 | 3.3 | | | C | | | | | | | | |
| 247 | 3.1 | | | C | D | | | | | | | |
| 206 | 3.0 | | | C | D | E | | | | | | |
| 246 | 3.0 | | | C | D | E | | | | | | |
| 267 | 3.0 | | | C | D | E | | | | | | |
| 14 | 2.9 | | | C | D | E | F | | | | | |
| 271 | 2.9 | | | C | D | E | F | | | | | |
| 236 | 2.8 | | | C | D | E | F | G | | | | |
| 85 | 2.8 | | | C | D | E | F | G | | | | |
| RL | 2.8 | | | C | D | E | F | G | | | | |
| 68 | 2.8 | | | | D | E | F | G | H | | | |
| 268 | 2.7 | | | | D | E | F | G | H | I | | |
| 31 | 2.6 | | | | | E | F | G | H | I | J | |
| 37 | 2.6 | | | | | E | F | G | H | I | J | |
| 237 | 2.5 | | | | | | F | G | H | I | J | K |
| 238 | 2.5 | | | | | | F | G | H | I | J | K |
| 248 | 2.5 | | | | | | F | G | H | I | J | K |
| 244 | 2.5 | | | | | | F | G | H | I | J | K |
| 279 | 2.5 | | | | | | F | G | H | I | J | K |
| 21 | 2.4 | | | | | | | G | H | I | J | K | L | |
| 235 | 2.3 | | | | | | | | H | I | J | K | L | |
| 232 | 2.3 | | | | | | | | | I | J | K | L | |
| 274 | 2.2 | | | | | | | | | | J | K | L | |
| 225 | 2.1 | | | | | | | | | | | K | L | |
| 233 | 2.0 | | | | | | | | | | | | L | |
| 1 | 0.0 | | | | | | | | | | | | | M |
| 17 | 0.0 | | | | | | | | | | | | | M |
| 208 | 0.0 | | | | | | | | | | | | | M |
| 227 | 0.0 | | | | | | | | | | | | | M |
| 228 | 0.0 | | | | | | | | | | | | | M |
| 234 | 0.0 | | | | | | | | | | | | | M |
| 239 | 0.0 | | | | | | | | | | | | | M |
| 250 | 0.0 | | | | | | | | | | | | | M |
| 251 | 0.0 | | | | | | | | | | | | | M |
| 255 | 0.0 | | | | | | | | | | | | | M |
| 263 | 0.0 | | | | | | | | | | | | | M |
| 266 | 0.0 | | | | | | | | | | | | | M |
| 270 | 0.0 | | | | | | | | | | | | | M |
| 273 | 0.0 | | | | | | | | | | | | | M |
| 275 | 0.0 | | | | | | | | | | | | | M |
| 277 | 0.0 | | | | | | | | | | | | | M |
| 28 | 0.0 | | | | | | | | | | | | | M |
| 281 | 0.0 | | | | | | | | | | | | | M |
| 306 | 0.0 | | | | | | | | | | | | | M |
| 33 | 0.0 | | | | | | | | | | | | | M |
| 42 | 0.0 | | | | | | | | | | | | | M |
| 93 | 0.0 | | | | | | | | | | | | | M |
| NAB | 0.0 | | | | | | | | | | | | | M |
| VRH8624 | 0.0 | | | | | | | | | | | | | M |
| VRH8771 | 0.0 | | | | | | | | | | | | | M |

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**TABLE S3.** Distribution of the segregating individuals of the progeny VRH8771 x CS using the gall index (GI: 0-5) rating criterion for resistance to the isolates of *M. arenaria* (MA; 44 individuals), *M. incognita* (MI; 45 individuals), and *M. javanica* (MJ; 51 individuals). R resistant, S susceptible, NT not tested.

| | **Phenotype** | | |
|---|---|---|---|
| | **MA** | **MI** | **MJ** |
| Hybrids 8771 x CS | | | |
| 1 | R | R | R |
| 4 | S | S | S |
| 14 | S | S | S |
| 17 | R | R | R |
| 21 | S | S | S |
| 28 | R | R | R |
| 31 | S | S | S |
| 33 | R | R | R |
| 37 | S | S | S |
| 42 | R | R | R |
| 48 | S | S | S |
| 68 | S | S | S |
| 82 | S | S | S |
| 85 | NT | S | S |
| 93 | R | R | R |
| 206 | NT | NT | S |
| 207 | S | S | S |
| 208 | NT | NT | R |
| 225 | S | S | S |
| 227 | R | R | R |
| 228 | R | R | R |
| 232 | S | S | S |
| 233 | S | S | S |
| 234 | R | R | R |
| 235 | S | S | S |
| 236 | S | S | S |
| 237 | S | S | S |
| 238 | S | S | S |
| 239 | R | R | R |
| 240 | S | S | S |
| 244 | S | S | S |
| 246 | S | S | S |
| 247 | S | S | S |
| 248 | S | S | S |
| 250 | R | R | R |
| 251 | R | R | R |
| 255 | NT | NT | R |
| 262 | S | S | S |
| 263 | R | R | R |
| 266 | R | R | R |
| 267 | S | S | S |
| 268 | NT | NT | S |
| 270 | R | R | R |
| 271 | S | S | S |
| 273 | R | R | R |
| 274 | NT | NT | S |
| 275 | NT | NT | R |
| 277 | R | R | R |
| 279 | S | S | S |
| 281 | R | R | R |
| 306 | R | R | R |
| Total number | 44 | 45 | 51 |
| R/S segregation | 19R:25S | 19R:26S | 22R:29S |
| Parental and reference accessions | | | |
| VRH8771 | R | R | R |
| CS | S | S | S |
| VRH8624 | R | R | R |
| RL | S | S | S |
| NAB | R | R | R |

Author, N., Author, N., & Author, N. (2023). Lorem ipsum. *OENO One*, *57*(3).
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**TABLE S4.** Distribution of the segregating individuals of the progeny VRH8771 x CS using the gall index (GI: 0-5) rating criterion for resistance to the mixed Harmony-virulent populations of *M. arenaria* and *M. incognita*. Gall index values followed by the same uppercase letter do not differ according to the Fischer multiple range test at $P < 0.05$. The horizontal line separates the S and R plant individuals.

| Plant material | Gall index | Groups | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 233 | 3.9 | A | | | | | | | | |
| 82 | 3.5 | A | B | | | | | | | |
| 279 | 3.3 | A | B | C | | | | | | |
| 48 | 3.3 | A | B | C | | | | | | |
| 240 | 3.2 | A | B | C | D | | | | | |
| CS | 3.2 | A | B | C | D | | | | | |
| 237 | 3.1 | | B | C | D | | | | | |
| 207 | 3.1 | | B | C | D | | | | | |
| 246 | 3.1 | | B | C | D | | | | | |
| 21 | 2.9 | | B | C | D | E | | | | |
| 262 | 2.9 | | B | C | D | E | | | | |
| 271 | 2.8 | | B | C | D | E | F | | | |
| 225 | 2.7 | | | C | D | E | F | G | | |
| 236 | 2.7 | | | C | D | E | F | G | H | |
| 248 | 2.6 | | | C | D | E | F | G | H | |
| 85 | 2.6 | | | C | D | E | F | G | H | |
| 14 | 2.5 | | | | D | E | F | G | H | I |
| 4 | 2.3 | | | | | E | F | G | H | I |
| 238 | 2.1 | | | | | | F | G | H | I |
| 37 | 2.1 | | | | | | F | G | H | I |
| 244 | 2.0 | | | | | | | G | H | I |
| 267 | 1.9 | | | | | | | | H | I |
| 31 | 1.8 | | | | | | | | | I |
| NAB | 0.3 | | | | | | | | | J |
| 1 | 0.0 | | | | | | | | | J |
| 228 | 0.0 | | | | | | | | | J |
| 239 | 0.0 | | | | | | | | | J |
| 250 | 0.0 | | | | | | | | | J |
| 263 | 0.0 | | | | | | | | | J |
| 266 | 0.0 | | | | | | | | | J |
| 281 | 0.0 | | | | | | | | | J |
| 227 | 0.0 | | | | | | | | | J |
| 234 | 0.0 | | | | | | | | | J |
| 28 | 0.0 | | | | | | | | | J |
| VRH8624 | 0.0 | | | | | | | | | J |
| VRH8771 | 0.0 | | | | | | | | | J |

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**TABLE S5.** Distribution of the segregating individuals of the progeny VRH8771 x CS using the gall index (GI: 0-5) rating criterion for resistance to the Harmony-virulent isolate of *M. arenaria*. Gall index values followed by the same uppercase letter do not differ according to the Fischer multiple range test at $P < 0.05$. The horizontal line separates the S and R plant individuals.

| Plant material | Gall index | Groups |
|---|---|---|
| 248 | 4.5 | A |
| CS | 4.5 | A |
| 240 | 4.3 | A B |
| 246 | 4.2 | A B C |
| 262 | 4.0 | A B C D |
| 271 | 4.0 | A B C D |
| 31 | 4.0 | A B C D |
| Harmony | 4.0 | A B C D |
| 21 | 3.8 | A B C D E |
| 267 | 3.8 | A B C D E |
| RL | 3.8 | A B C D E |
| 207 | 3.5 | B C D E F |
| 233 | 3.5 | B C D E F |
| 82 | 3.5 | B C D E F |
| 48 | 3.3 | C D E F G |
| 85 | 3.2 | D E F G |
| 4 | 3.0 | E F G H |
| 225 | 2.7 | F G H I |
| 236 | 2.5 | G H I |
| 37 | 2.5 | G H I |
| 14 | 2.2 | H I |
| 244 | 2.0 | I |
| NAB | 0.3 | J |
| 227 | 0.0 | J |
| 228 | 0.0 | J |
| 234 | 0.0 | J |
| 239 | 0.0 | J |
| 263 | 0.0 | J |
| 266 | 0.0 | J |
| 28 | 0.0 | J |
| 281 | 0.0 | J |
| VRH8624 | 0.0 | J |
| VRH8771 | 0.0 | J |
| 1 | 0.0 | J |

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**TABLE S6.** Distribution of the segregating individuals of the progeny VRH8771 x CS using the gall index (GI: 0-5) rating criterion for resistance to the Harmony-virulent isolate of *M. incognita*. Gall index values followed by the same uppercase letter do not differ according to the Fischer multiple range test at $P < 0.05$. The horizontal line separates the S and R plant individuals.

| Plant material | Gall index | Groups | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 246 | 4.0 | A | | | | | | | | |
| 48 | 3.8 | A | B | | | | | | | |
| 82 | 3.7 | A | B | C | | | | | | |
| 85 | 3.7 | A | B | C | | | | | | |
| 207 | 3.5 | A | B | C | D | | | | | |
| 31 | 3.5 | A | B | C | D | | | | | |
| CS | 3.5 | A | B | C | D | | | | | |
| RL | 3.5 | A | B | C | D | | | | | |
| 14 | 3.3 | A | B | C | D | E | | | | |
| 21 | 3.3 | A | B | C | D | E | | | | |
| 240 | 3.3 | A | B | C | D | E | | | | |
| 244 | 3.2 | | B | C | D | E | F | | | |
| 37 | 3.2 | | B | C | D | E | F | | | |
| 4 | 3.2 | | B | C | D | E | F | | | |
| 262 | 3.0 | | | C | D | E | F | | | |
| 271 | 2.8 | | | | D | E | F | | | |
| 233 | 2.7 | | | | | E | F | G | | |
| 236 | 2.7 | | | | | E | F | G | | |
| 248 | 2.7 | | | | | E | F | G | | |
| 267 | 2.5 | | | | | | F | G | | |
| 225 | 2.0 | | | | | | | G | H | |
| Harmony | 1.5 | | | | | | | | H | |
| NAB | 0.5 | | | | | | | | | I |
| 227 | 0.0 | | | | | | | | | I |
| 228 | 0.0 | | | | | | | | | I |
| 234 | 0.0 | | | | | | | | | I |
| 239 | 0.0 | | | | | | | | | I |
| 263 | 0.0 | | | | | | | | | I |
| 266 | 0.0 | | | | | | | | | I |
| 28 | 0.0 | | | | | | | | | I |
| 281 | 0.0 | | | | | | | | | I |
| VRH8624 | 0.0 | | | | | | | | | I |
| VRH8771 | 0.0 | | | | | | | | | I |
| 1 | 0.0 | | | | | | | | | I |

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**TABLE S7.** Distribution of the segregating individuals of the progeny VRH8771 x CS using the gall index (GI: 0-5) rating criterion for resistance to an isolate of *M. ethiopica*. Gall index values followed by the same uppercase letter do not differ according to the Fischer multiple range test at $P < 0.05$. The horizontal line separates the S and R plant individuals.

| Plant material | Gall index | Groups | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 246 | 4.3 | A | | | | | | | |
| 233 | 4.0 | A | B | | | | | | |
| 240 | 4.0 | A | B | | | | | | |
| 267 | 3.7 | A | B | C | | | | | |
| 48 | 3.7 | A | B | C | | | | | |
| CS | 3.7 | A | B | C | | | | | |
| 207 | 3.5 | A | B | C | D | | | | |
| 85 | 3.5 | A | B | C | D | | | | |
| 236 | 3.3 | A | B | C | D | E | | | |
| 248 | 3.3 | A | B | C | D | E | | | |
| 31 | 3.2 | | B | C | D | E | F | | |
| 14 | 3,0 | | B | C | D | E | F | | |
| 225 | 3,0 | | B | C | D | E | F | | |
| 82 | 2.8 | | | C | D | E | F | | |
| RL | 2.8 | | | C | D | E | F | | |
| 21 | 2.7 | | | C | D | E | F | G | |
| 271 | 2.7 | | | C | D | E | F | G | |
| 37 | 2.5 | | | | D | E | F | G | |
| 262 | 2.3 | | | | | E | F | G | |
| 4 | 2.2 | | | | | | F | G | |
| 244 | 1.7 | | | | | | | G | |
| NAB | 0.2 | | | | | | | | H |
| 227 | 0.0 | | | | | | | | H |
| 228 | 0.0 | | | | | | | | H |
| 234 | 0.0 | | | | | | | | H |
| 239 | 0.0 | | | | | | | | H |
| 263 | 0.0 | | | | | | | | H |
| 266 | 0.0 | | | | | | | | H |
| 28 | 0.0 | | | | | | | | H |
| 281 | 0.0 | | | | | | | | H |
| VRH8624 | 0.0 | | | | | | | | H |
| VRH8771 | 0.0 | | | | | | | | H |
| Harmony | 0.0 | | | | | | | | H |
| 1 | 0.0 | | | | | | | | H |

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**TABLE S8.** Synthesis of the R/S phenotypes of the segregating individuals of the progeny VRH8771 x CS to all RKN isolates and populations evaluated.

| | Phenotype | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **VRH8771 x CS** | **Isolate *M. arenaria*** | **Isolate *M. incognita*** | **Isolate *M. javanica*** | **Isolate *M. ethiopica*** | **Mixed Harmony populations** | **Isolate *M. arenaria* Harmony** | **Isolate *M. incognita* Harmony** | **Common ind.[2]** |
| **1** | R | R | R | R | R | R | R | 1 |
| **4** | S | S | S | S | S | S | S | 2 |
| **14** | S | S | S | S | S | S | S | 3 |
| **17** | R | R | R | NT[1] | NT | NT | NT | |
| **21** | S | S | S | S | S | S | S | 4 |
| **28** | R | R | R | R | R | R | R | 5 |
| **31** | S | S | S | S | S | S | S | 6 |
| **33** | R | R | R | NT | NT | NT | NT | |
| **37** | S | S | S | S | S | S | S | 7 |
| **42** | R | R | R | NT | NT | NT | NT | |
| **48** | S | S | S | S | S | S | S | 8 |
| **68** | S | S | S | NT | NT | NT | NT | |
| **82** | S | S | S | S | S | S | S | 9 |
| **85** | NT | S | S | S | S | S | S | |
| **93** | R | R | R | NT | NT | NT | NT | |
| **206** | NT | NT | S | NT | NT | NT | NT | |
| **207** | S | S | S | S | S | S | S | 10 |
| **208** | NT | NT | R | NT | NT | NT | NT | |
| **225** | S | S | S | S | S | S | S | 11 |
| **227** | R | R | R | R | R | R | R | 12 |
| **228** | R | R | R | R | R | R | R | 13 |
| **232** | S | S | S | NT | NT | NT | NT | |
| **233** | S | S | S | S | S | S | S | 14 |
| **234** | R | R | R | R | R | R | R | 15 |
| **235** | S | S | S | NT | NT | NT | NT | |
| **236** | S | S | S | S | S | S | S | 16 |
| **237** | S | S | S | NT | S | NT | NT | |
| **238** | S | S | S | NT | S | NT | NT | |
| **239** | R | R | R | R | R | R | R | 17 |
| **240** | S | S | S | S | S | S | S | 18 |
| **244** | S | S | S | S | S | S | S | 19 |
| **246** | S | S | S | S | S | S | S | 20 |
| **247** | S | S | S | NT | NT | NT | NT | |
| **248** | S | S | S | S | S | S | S | 21 |
| **250** | R | R | R | NT | R | NT | NT | |
| **251** | R | R | R | NT | NT | NT | NT | |
| **255** | NT | NT | R | NT | NT | NT | NT | |
| **262** | S | S | S | S | S | S | S | 22 |
| **263** | R | R | R | R | R | R | R | 23 |
| **266** | R | R | R | R | R | R | R | 24 |
| **267** | S | S | S | S | S | S | S | 25 |
| **268** | NT | NT | S | NT | NT | NT | NT | |
| **270** | R | R | R | NT | NT | NT | NT | |
| **271** | S | S | S | S | S | S | S | 26 |
| **273** | R | R | R | NT | NT | NT | NT | |
| **274** | NT | NT | S | NT | NT | NT | NT | |
| **275** | NT | NT | R | NT | NT | NT | NT | |
| **277** | R | R | R | NT | NT | NT | NT | |
| **279** | S | S | S | NT | S | NT | NT | |
| **281** | R | R | R | R | R | R | R | 27 |
| **306** | R | R | R | NT | NT | NT | NT | |
| **Total number** | **44** | **45** | **51** | **28** | **32** | **28** | **28** | |
| **Segregation R/S** | **19R:25S** | **19R:26S** | **22R:29S** | **9R:19S** | **10R:22S** | **9R:19S** | **9R:19S** | |
| **VRH8771** | R | R | R | R | R | R | R | |
| **CS** | S | S | S | S | S | S | S | |
| **VRH8624** | R | R | R | R | R | R | R | |
| **NAB** | R | R | R | R | R | R | R | |
| **RL** | S | S | S | S | NT | S | S | |
| **Harmony** | NT | NT | NT | R | NT | S | S | |

[1] NT Not tested
[2] A total of 27 individuals in grey have been tested to all isolates and populations

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**TABLE S9.** Detailed plant mortality in the parental/reference accessions and in the R/S segregating progeny VRH8771 x CS towards the Harmony-virulent isolates of *M. arenaria* and *M. incognita* together with the isolate of *M. ethiopica*. Rep replicate, R resistant, S susceptible.

| **Ind. or hybrids** | **Phenotype to other RKN isolates** | ***M. arenaria* Harmony** | | | ***M. incognita* Harmony** | | | ***M. ethiopica*** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Parents and references** | | **Rep 1** | **Rep 2** | **Rep 3** | **Rep 1** | **Rep 2** | **Rep 3** | **Rep 1** | **Rep 2** | **Rep 3** |
| VRH8771 | R | R | R | R | R | R | R | R | R | R |
| NAB | R | R | R | R | R | R | R | R | R | R |
| VRH8624 | R | R | R | R | R | R | R | R | R | R |
| Cabernet-Sauvignon | S | S | S | S | S | S | S | S | S | S |
| Rupestris du Lot | S | S | S | S | S | S | S | S | S | S |
| Harmony | S | S | S | S | S | S | S | R | R | R |
| **Progeny VRH8771 x CS** | | | | | | | | | | |
| 1 | R | R | R | R | R | R | R | R | R | R |
| 4 | S | S | S | S | S | S | S | S | S | S |
| 14 | S | S | S | S | S | S | S | S | S | S |
| 21 | S | S | S | S | S | S | S | S | S | S |
| 28 | R | R | R | R | R | R | R | R | R | R |
| 31 | S | S | S | S | S | S | S | S | S | S |
| 37 | S | S | S | S | S | S | S | S | S | S |
| 48 | S | S | S | S | S | S | S | S | S | S |
| 82 | S | S | S | S | S | S | S | S | S | S |
| 85 | S | S | S | S | S | S | S | S | S | S |
| 207 | S | S | S | S | S | S | S | S | S | S |
| 225 | S | S | S | S | S | S | S | S | S | S |
| 227 | R | R | R | R | R | R | R | R | R | R |
| 228 | R | R | R | R | R | R | R | R | R | R |
| 233 | S | S | S | S | S | S | S | S | S | S |
| 234 | R | R | R | R | R | R | R | R | R | R |
| 236 | S | S | S | S | S | S | S | S | S | S |
| 239 | R | R | R | R | R | R | R | R | R | R |
| 240 | S | S | S | S | S | S | S | S | S | S |
| 244 | S | S | S | S | S | S | S | S | S | S |
| 246 | S | S | S | S | S | S | S | S | S | S |
| 248 | S | S | S | S | S | S | S | S | S | S |
| 262 | S | S | S | S | S | S | S | S | S | S |
| 263 | R | R | R | R | R | R | R | R | R | R |
| 266 | R | R | R | R | R | R | R | R | R | R |
| 267 | S | S | S | S | S | S | S | S | S | S |
| 271 | S | | S | S | S | S | S | S | S | S |
| 281 | R | R | R | R | R | R | R | R | R | R |
| **Legend** | | **# dead S plants** | | 24 | **# dead S plants** | | 20 | **# dead S plants** | | 10 |
| **Dead plants** | | **# dead R plants** | | 0 | **# dead R plants** | | 0 | **# dead R plants** | | 0 |
| **Susceptible plant** | S | **Total # dead plants** | | 24 | **Total # dead plants** | | 20 | **Total # dead plants** | | 10 |

**Data file S1- Gall index rating of plant material to *M. arenaria* (MA), *M. incognita* (MI) and *M. javanica* (MJ) isolates**

MD = missing data

NT = not tested

| | | | Gall index (0-5) | | |
|---|---|---|---|---|---|
| Number of individuals | Individual | Replicate | *M arenaria* (MA) | *M. incognita* (MI) | *M. javanica* (MJ) |
| | 1 | 1 | 0 | 0 | 0 |
| 1 | 1 | 2 | 0 | 0 | 0 |
| | 1 | 3 | 0 | 0 | 0 |
| | 1 | 4 | 0 | 0 | 0 |
| | 4 | 1 | 4 | 3.5 | 4 |
| 2 | 4 | 2 | 4.5 | 3 | 4 |
| | 4 | 3 | 3.5 | 3.5 | 3 |
| | 4 | 4 | 4 | 4 | 4 |
| | 14 | 1 | 2.5 | 2 | 3 |
| 3 | 14 | 2 | 3 | 2.5 | 3 |
| | 14 | 3 | 2.5 | 2 | 3.5 |
| | 14 | 4 | 2.5 | 3 | 2 |
| | 17 | 1 | 0 | 0 | 0 |
| 4 | 17 | 2 | 0 | 0 | 0 |
| | 17 | 3 | 0 | 0 | 0 |
| | 17 | 4 | 0 | MD | 0 |
| | 21 | 1 | 2.5 | 2 | 2 |
| 5 | 21 | 2 | 3 | 3.5 | 3 |
| | 21 | 3 | 2 | 3 | 2.5 |
| | 21 | 4 | 2.5 | 3.5 | 2 |
| | 28 | 1 | 0 | 0.5 | 0 |
| 6 | 28 | 2 | 0 | 0.5 | 0 |
| | 28 | 3 | 0 | 0.5 | 0 |
| | 28 | 4 | 0 | 0.5 | 0 |
| | 31 | 1 | 3 | 3.5 | 2.5 |
| 7 | 31 | 2 | 2.5 | 4 | 2.5 |
| | 31 | 3 | 3 | 3.5 | 3 |
| | 31 | 4 | 3 | 4 | 2.5 |
| | 33 | 1 | 0 | 0 | 0 |
| 8 | 33 | 2 | 0 | 0 | 0 |
| | 33 | 3 | 0 | 0 | 0 |
| | 33 | 4 | 0 | MD | 0 |
| | 37 | 1 | 2.5 | 1.5 | 3 |
| 9 | 37 | 2 | 3.5 | 2 | 2.5 |
| | 37 | 3 | 3 | 2 | 2 |
| | 37 | 4 | 3 | 5 | 3 |
| | 42 | 1 | 0 | 0.5 | 0 |
| 10 | 42 | 2 | 0 | 0 | 0 |
| | 42 | 3 | 0 | 0 | 0 |
| | 42 | 4 | 0 | 0 | 0 |
| | 48 | 1 | 5 | 4 | 4.5 |
| 11 | 48 | 2 | 4.5 | 4 | 4.5 |
| | 48 | 3 | 4.5 | 4.5 | 4 |
| | 48 | 4 | 4 | 3.5 | 4.5 |
| | 68 | 1 | 2 | 3.5 | 2.5 |
| 12 | 68 | 2 | 3.5 | 4 | 3 |
| | 68 | 3 | 3 | 2.5 | 2.5 |
| | 68 | 4 | 3 | 2.5 | 3 |
| | 82 | 1 | 4 | 2.5 | 4.5 |
| 13 | 82 | 2 | 4 | 3 | 3.5 |
| | 82 | 3 | 4.5 | 2.5 | 4 |
| | 82 | 4 | 4.5 | 2.5 | 4 |
| | 85 | 1 | NT | 2.5 | 3 |
| 14 | 85 | 2 | NT | 3 | 3 |
| | 85 | 3 | NT | MD | 2.5 |

| | | | | | |
|---|---|---|---|---|---|
| | 85 | 4 | NT | MD | MD |
| | 93 | 1 | 0 | 0 | 0 |
| 15 | 93 | 2 | 0 | 0 | 0 |
| | 93 | 3 | 0 | 0 | 0 |
| | 93 | 4 | MD | MD | 0 |
| | 206 | 1 | NT | NT | 2.5 |
| 16 | 206 | 2 | NT | NT | 3.5 |
| | 206 | 3 | NT | NT | 3 |
| | 206 | 4 | NT | NT | MD |
| | 207 | 1 | 4.5 | 4.5 | 4 |
| 17 | 207 | 2 | 4 | 4.5 | 3.5 |
| | 207 | 3 | 4 | 4 | 4.5 |
| | 207 | 4 | 4.5 | 4 | 4 |
| | 208 | 1 | NT | NT | 0 |
| 18 | 208 | 2 | NT | NT | 0 |
| | 208 | 3 | NT | NT | 0 |
| | 208 | 4 | NT | NT | 0 |
| | 225 | 1 | 2.5 | 3 | 1.5 |
| 19 | 225 | 2 | 4.5 | 1.5 | 2 |
| | 225 | 3 | 4.5 | 2 | 2.5 |
| | 225 | 4 | 3.5 | MD | 2.5 |
| | 227 | 1 | 0 | 0 | 0 |
| 20 | 227 | 2 | 0 | 0 | 0 |
| | 227 | 3 | 0 | 0 | 0 |
| | 227 | 4 | 0 | 0 | 0 |
| | 228 | 1 | 0 | 0 | 0 |
| 21 | 228 | 2 | 0 | 0 | 0 |
| | 228 | 3 | 0 | 0 | 0 |
| | 228 | 4 | 0 | 0 | 0 |
| | 232 | 1 | 3 | 1.5 | 2 |
| 22 | 232 | 2 | 2.5 | 4 | 2.5 |
| | 232 | 3 | 2.5 | 1.5 | 2.5 |
| | 232 | 4 | 3 | 2 | 2 |
| | 233 | 1 | 3 | 1.5 | 2 |
| 23 | 233 | 2 | 3.5 | 3.5 | 1.5 |
| | 233 | 3 | 3.5 | 3 | 2 |
| | 233 | 4 | 4 | 2.5 | 2.5 |
| | 234 | 1 | 0 | 0 | 0 |
| 24 | 234 | 2 | 0 | 0 | 0 |
| | 234 | 3 | 0 | MD | 0 |
| | 234 | 4 | 0 | 0 | 0 |
| | 235 | 1 | 2.5 | 2 | 2.5 |
| 25 | 235 | 2 | 3 | 2.5 | 2 |
| | 235 | 3 | 3 | MD | MD |
| | 235 | 4 | 4 | MD | MD |
| | 236 | 1 | 3.5 | 2.5 | 3 |
| 26 | 236 | 2 | 4 | MD | MD |
| | 236 | 3 | 4 | MD | 2.5 |
| | 236 | 4 | 4 | 3.5 | 3 |
| | 237 | 1 | 2.5 | 2 | 3 |
| 27 | 237 | 2 | 3.5 | 2.5 | 2 |
| | 237 | 3 | 3.5 | 3 | 2.5 |
| | 237 | 4 | 3.5 | MD | MD |
| | 238 | 1 | 3.5 | 2 | 3 |
| 28 | 238 | 2 | 3 | 2.5 | 2 |
| | 238 | 3 | 3 | MD | MD |
| | 238 | 4 | MD | MD | 2.5 |
| | 239 | 1 | 0 | 0 | 0 |
| 29 | 239 | 2 | 0 | 0 | 0 |
| | 239 | 3 | 0 | 0 | 0 |
| | 239 | 4 | 0 | 0 | 0 |
| | 240 | 1 | 4.5 | 4.5 | 4.5 |

| | | | | | |
|---|---|---|---|---|---|
| 30 | 240 | 2 | 4.5 | 3.5 | 4.5 |
| | 240 | 3 | 4.5 | 3.5 | 4 |
| | 240 | 4 | 4 | 3.5 | 3.5 |
| | 244 | 1 | 3 | 0 | 2.5 |
| 31 | 244 | 2 | 3.5 | 3 | 2 |
| | 244 | 3 | 3 | 4 | 3 |
| | 244 | 4 | 3.5 | 2.5 | 2.5 |
| | 246 | 1 | 2.5 | 4 | 3 |
| 32 | 246 | 2 | 3.5 | 4 | 3.5 |
| | 246 | 3 | 4 | 4 | 2.5 |
| | 246 | 4 | 4.5 | 3.5 | 3 |
| | 247 | 1 | 3 | 2.5 | 3.5 |
| 33 | 247 | 2 | 3.5 | 4.5 | 3 |
| | 247 | 3 | 3 | 3.5 | 2.5 |
| | 247 | 4 | 4 | 3.5 | 3.5 |
| | 248 | 1 | 2.5 | 3 | 3 |
| 34 | 248 | 2 | 2.5 | 2.5 | 2 |
| | 248 | 3 | MD | 2.5 | MD |
| | 248 | 4 | MD | 2.5 | 2.5 |
| | 250 | 1 | 0 | 0 | 0 |
| 35 | 250 | 2 | 0 | 0 | 0 |
| | 250 | 3 | 0 | 0 | 0 |
| | 250 | 4 | 0 | 0 | 0 |
| | 251 | 1 | 0 | 0.5 | 0 |
| 36 | 251 | 2 | 0 | 0 | 0 |
| | 251 | 3 | 0 | 0 | 0 |
| | 251 | 4 | 0 | 0 | 0 |
| | 255 | 1 | NT | NT | 0 |
| 37 | 255 | 2 | NT | NT | 0 |
| | 255 | 3 | NT | NT | 0 |
| | 255 | 4 | NT | NT | 0 |
| | 262 | 1 | 4 | 4.5 | 3 |
| 38 | 262 | 2 | 4 | 3 | 3.5 |
| | 262 | 3 | 4 | 2.5 | 3 |
| | 262 | 4 | 4.5 | 4 | 3.5 |
| | 263 | 1 | 0 | 0 | 0 |
| 39 | 263 | 2 | 0 | 0 | 0 |
| | 263 | 3 | 0 | 0 | 0 |
| | 263 | 4 | 0 | 0 | 0 |
| | 266 | 1 | 0 | 0 | 0 |
| 40 | 266 | 2 | 0 | 0 | 0 |
| | 266 | 3 | 0 | 0 | 0 |
| | 266 | 4 | 0 | 0 | MD |
| | 267 | 1 | 3.5 | 2.5 | 3 |
| 41 | 267 | 2 | 4 | 3 | 2.5 |
| | 267 | 3 | 4 | 3.5 | 3 |
| | 267 | 4 | 3 | 4 | 3.5 |
| | 268 | 1 | NT | NT | MD |
| 42 | 268 | 2 | NT | NT | 3 |
| | 268 | 3 | NT | NT | 2.5 |
| | 268 | 4 | NT | NT | 2.5 |
| | 270 | 1 | 0 | 0 | 0 |
| 43 | 270 | 2 | 0 | 0 | 0 |
| | 270 | 3 | 0 | 0 | 0 |
| | 270 | 4 | 0 | MD | 0 |
| | 271 | 1 | 3.5 | 2.5 | 2.5 |
| 44 | 271 | 2 | 4.5 | 3.5 | 3.5 |
| | 271 | 3 | 4.5 | 2.5 | 3 |
| | 271 | 4 | 4 | MD | 2.5 |
| | 273 | 1 | 0 | 0 | 0 |
| 45 | 273 | 2 | 0 | 0 | 0 |
| | 273 | 3 | 0 | 0 | 0 |

| | | | | | |
|---|---|---|---|---|---|
| | 273 | 4 | MD | MD | MD |
| | 274 | 1 | NT | NT | 2.5 |
| 46 | 274 | 2 | NT | NT | 2 |
| | 274 | 3 | NT | NT | MD |
| | 274 | 4 | NT | NT | 2 |
| | 275 | 1 | NT | NT | 0 |
| 47 | 275 | 2 | NT | NT | 0 |
| | 275 | 3 | NT | NT | 0 |
| | 275 | 4 | NT | NT | 0 |
| | 277 | 1 | 0 | 0 | 0 |
| 48 | 277 | 2 | 0 | 0 | 0 |
| | 277 | 3 | 0 | 0 | 0 |
| | 277 | 4 | MD | MD | MD |
| | 279 | 1 | 3.5 | 3.5 | 2.5 |
| 49 | 279 | 2 | 4.5 | 2.5 | 2.5 |
| | 279 | 3 | MD | 3 | 3 |
| | 279 | 4 | MD | 2.5 | 2 |
| | 281 | 1 | 0 | 0 | 0 |
| 50 | 281 | 2 | 0 | 0 | MD |
| | 281 | 3 | 0 | 0 | 0 |
| | 281 | 4 | 0 | 0 | 0 |
| | 306 | 1 | 0 | 0 | 0 |
| 51 | 306 | 2 | 0 | 0 | 0 |
| | 306 | 3 | 0 | 0 | 0 |
| | 306 | 4 | 0 | MD | 0 |
| | VRH8771 | 1 | 0 | 0 | 0 |
| 52 | VRH8771 | 2 | 0 | 0 | 0 |
| | VRH8771 | 3 | 0 | MD | 0 |
| | VRH8771 | 4 | MD | MD | 0 |
| | CS | 1 | 4 | 4.5 | 5 |
| 53 | CS | 2 | 4.5 | 4.5 | 4 |
| | CS | 3 | 4.5 | MD | 4.5 |
| | CS | 4 | 5 | MD | 4 |
| | VRH8624 | 1 | 0 | 0 | 0 |
| 54 | VRH8624 | 2 | 0 | 0 | 0 |
| | VRH8624 | 3 | 0 | 0 | 0 |
| | VRH8624 | 4 | 0 | 0 | 0 |
| | RL | 1 | 2.5 | 3.5 | 3 |
| 55 | RL | 2 | 3 | 4.5 | MD |
| | RL | 3 | 4.5 | 4.5 | 2.5 |
| | RL | 4 | MD | MD | 3 |
| | NAB | 1 | 0 | 1 | 0 |
| 56 | NAB | 2 | 0 | 0.5 | 0 |
| | NAB | 3 | 0 | 0.5 | 0 |
| | NAB | 4 | 0 | 1 | 0 |

**Data file S2- Gall index rating of plant material to the mixture of the two Harmony-virulent populations of *M. arenaria* and *M. incognita***

| Individual | Replicate | Gall index (0-5) |
|---|---|---|
| CS | 1 | 3 |
| CS | 2 | 3.5 |
| CS | 3 | 3 |
| VRH8624 | 1 | 0 |
| VRH8624 | 2 | 0 |
| VR8624 | 3 | 0 |
| VRH8771 | 1 | 0 |
| VRH8771 | 2 | 0 |
| VRH8771 | 3 | 0 |
| NAB | 1 | 0 |
| NAB | 2 | 1 |
| NAB | 3 | 0 |
| 1 | 1 | 0 |
| 1 | 2 | 0 |
| 1 | 3 | 0 |
| 1 | 4 | 0 |
| 1 | 5 | 0 |
| 4 | 1 | 2.5 |
| 4 | 2 | 2 |
| 4 | 3 | 2.5 |
| 4 | 4 | 1.5 |
| 4 | 5 | 3 |
| 14 | 1 | 3 |
| 14 | 2 | 2.5 |
| 14 | 3 | 2 |
| 14 | 4 | 2 |
| 14 | 5 | 3 |
| 21 | 1 | 3.5 |
| 21 | 2 | 2 |
| 21 | 3 | 3 |
| 21 | 4 | 2.5 |
| 21 | 5 | 3.5 |
| 28 | 1 | 0 |
| 28 | 2 | 0 |
| 28 | 3 | 0 |
| 28 | 4 | 0 |
| 31 | 1 | 2 |
| 31 | 2 | 1.5 |
| 31 | 3 | 2 |
| 31 | 4 | 1.5 |
| 37 | 1 | 2.5 |
| 37 | 2 | 2 |
| 37 | 3 | 2.5 |
| 37 | 4 | 1.5 |
| 48 | 1 | 3 |
| 48 | 2 | 3 |
| 48 | 3 | 3.5 |
| 48 | 4 | 3.5 |
| 48 | 5 | 3.5 |
| 82 | 1 | 4 |
| 82 | 2 | 3.5 |
| 82 | 3 | 3 |
| 82 | 4 | 3.5 |
| 85 | 1 | 3 |
| 85 | 2 | 2 |
| 85 | 3 | 2.5 |
| 85 | 4 | 2 |
| 85 | 5 | 3.5 |
| 207 | 1 | 4 |

| Individual | Replicate | Gall index (0-5) |
|---|---|---|
| 234 | 1 | 0 |
| 234 | 2 | 0 |
| 234 | 3 | 0 |
| 234 | 4 | 0 |
| 236 | 1 | 3 |
| 236 | 2 | 2.5 |
| 236 | 3 | 2.5 |
| 237 | 1 | 3 |
| 237 | 2 | 3.5 |
| 237 | 3 | 3 |
| 237 | 4 | 3 |
| 238 | 1 | 3 |
| 238 | 2 | 3.5 |
| 238 | 3 | 1 |
| 238 | 4 | 1 |
| 239 | 1 | 0 |
| 239 | 2 | 0 |
| 239 | 3 | 0 |
| 239 | 4 | 0 |
| 239 | 5 | 0 |
| 240 | 1 | 4 |
| 240 | 2 | 4 |
| 240 | 3 | 3 |
| 240 | 4 | 2.5 |
| 240 | 5 | 2.5 |
| 244 | 1 | 2.5 |
| 244 | 2 | 2 |
| 244 | 3 | 2 |
| 244 | 4 | 1.5 |
| 244 | 5 | 2 |
| 246 | 1 | 3 |
| 246 | 2 | 3 |
| 246 | 3 | 3 |
| 246 | 4 | 2.5 |
| 246 | 5 | 4 |
| 248 | 1 | 3.5 |
| 248 | 2 | 4 |
| 248 | 3 | 1.5 |
| 248 | 4 | 1.5 |
| 250 | 1 | 0 |
| 250 | 2 | 0 |
| 250 | 3 | 0 |
| 250 | 4 | 0 |
| 250 | 5 | 0 |
| 262 | 1 | 4 |
| 262 | 2 | 3.5 |
| 262 | 3 | 3.5 |
| 262 | 4 | 2.5 |
| 262 | 5 | 1 |
| 263 | 1 | 0 |
| 263 | 2 | 0 |
| 263 | 3 | 0 |
| 263 | 4 | 0 |
| 263 | 5 | 0 |
| 266 | 1 | 0 |
| 266 | 2 | 0 |
| 266 | 3 | 0 |
| 266 | 4 | 0 |
| 266 | 5 | 0 |

| | | |
|---|---|---|
| 207 | 2 | 4 |
| 207 | 3 | 2.5 |
| 207 | 4 | 3 |
| 207 | 5 | 2 |
| 225 | 1 | 3 |
| 225 | 2 | 3.5 |
| 225 | 3 | 2 |
| 225 | 4 | 2.5 |
| 225 | 5 | 2.5 |
| 227 | 1 | 0 |
| 227 | 2 | 0 |
| 227 | 3 | 0 |
| 227 | 4 | 0 |
| 228 | 1 | 0 |
| 228 | 2 | 0 |
| 228 | 3 | 0 |
| 228 | 4 | 0 |
| 228 | 5 | 0 |
| 233 | 1 | 4 |
| 233 | 2 | 4 |
| 233 | 3 | 4 |
| 233 | 4 | 4 |
| 233 | 5 | 3.5 |

| | | |
|---|---|---|
| 267 | 1 | 1.5 |
| 267 | 2 | 0.5 |
| 267 | 3 | 2.5 |
| 267 | 4 | 2.5 |
| 267 | 5 | 2.5 |
| 271 | 1 | 2.5 |
| 271 | 2 | 2 |
| 271 | 3 | 2.5 |
| 271 | 4 | 4 |
| 271 | 5 | 3 |
| 279 | 1 | 3 |
| 279 | 2 | 4 |
| 279 | 3 | 4 |
| 279 | 4 | 3 |
| 279 | 5 | 2.5 |
| 281 | 1 | 0 |
| 281 | 2 | 0 |
| 281 | 3 | 0 |
| 281 | 4 | 0 |
| 281 | 5 | 0 |

**Data file S3- Gall index rating (0-5) of plant material to the Harmony-virulent isolates of *M. arenaria* and *M. incognita* and to the *M. ethiopica* isolate**

| **Individual** | *M. arenaria* Harmony | | | *M. incognita* Harmony | | | *M. ethiopica* | | |
|---|---|---|---|---|---|---|---|---|---|
| | Rep 1 | Rep 2 | Rep 3 | Rep 1 | Rep 2 | Rep 3 | Rep 1 | Rep 2 | Rep 3 |
| VRH8771 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RPG1 | 0.5 | 0.5 | 0 | 0.5 | 0.5 | 0.5 | 0.5 | 0 | 0 |
| VRH8624 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CS | 4 | 5 | 4.5 | 4 | 3.5 | 3 | 3 | 3.5 | 4.5 |
| RL | 4 | 4 | 3.5 | 4.5 | 4.5 | 4.5 | 3 | 2 | 3.5 |
| Harmony | 4.5 | 3.5 | 4 | 1 | 1.5 | 2 | 0 | 0 | 0 |
| 8771 x CS 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8771 x CS 4 | 2.5 | 3.5 | 3 | 3.5 | 3 | 3 | 1 | 3.5 | 2 |
| 8771 x CS 14 | 2 | 2.5 | 2 | 4 | 3 | 3 | 3.5 | 3.5 | 2 |
| 8771 x CS 21 | 4.5 | 4 | 3 | 4 | 4 | 3.5 | 2 | 3 | 3 |
| 8771 x CS 28 | 0 | 0 | 0 | 0 | 0 | 0.5 | 0 | 0 | 0 |
| 8771 x CS 31 | 4.5 | 3.5 | 4 | 3 | 3.5 | 4 | 3 | 3 | 3.5 |
| 8771 x CS 37 | 3 | 3 | 1.5 | 2.5 | 3 | 4 | 3 | 1 | 3.5 |
| 8771 x CS 48 | 3.5 | 3.5 | 3 | 4 | 4 | 3.5 | 4.5 | 2.5 | 4 |
| 8771 x CS 82 | 4 | 3.5 | 3 | 3.5 | 4.5 | 3 | 3.5 | 3 | 2 |
| 8771 x CS 85 | 3.5 | 2 | 4 | 3 | 4 | 4 | 4 | 3 | 3.5 |
| 8771 x CS 207 | 3 | 3.5 | 4 | 3.5 | 4 | 3 | 4 | 3.5 | 3 |
| 8771 x CS 225 | 2.5 | 3 | 2.5 | 0.5 | 3 | 2.5 | 2.5 | 2.5 | 4 |
| 8771 x CS 227 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8771 x CS 228 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8771 x CS 233 | 3.5 | 3 | 4 | 3.5 | 2.5 | 2 | 4.5 | 4 | 3.5 |
| 8771 x CS 234 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8771 x CS 236 | 2 | 3.5 | 2 | 3 | 2 | 3 | 3 | 3 | 4 |
| 8771 x CS 239 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8771 x CS 240 | 4.5 | 4 | 4.5 | 3.5 | 3.5 | 3 | 4.5 | 3.5 | 4 |
| 8771 x CS 244 | 4 | 1 | 1 | 2.5 | 4 | 3 | 1.5 | 2 | 1.5 |
| 8771 x CS 246 | 4 | 4.5 | 4 | 4 | 4 | 4 | 4 | 4.5 | 4.5 |
| 8771 x CS 248 | 4 | 4.5 | 5 | 3 | 3 | 2 | 4 | 3.5 | 2.5 |
| 8771 x CS 262 | 4.5 | 3.5 | 4 | 3 | 3 | 3 | 2.5 | 2.5 | 2 |
| 8771 x CS 263 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8771 x CS 266 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8771 x CS 267 | 4.5 | 3 | 4 | 2.5 | 2 | 3 | 4 | 2.5 | 4.5 |
| 8771 x CS 271 | 3.5 | 4.5 | 4 | 2 | 3.5 | 3 | 1 | 3 | 4 |
| 8771 x CS 281 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Data file S4 - Numbers of juveniles (J2s) of the isolate *M. arenaria* Harmony in the roots**

| Individual | Replicate | J2 numbers/plant | Root weight (g) | J2 numbers/g |
|---|---|---|---|---|
| VRH8771 | 1 | 38 | 15.4 | 2.5 |
| VRH8771 | 2 | 110 | 29.5 | 3.7 |
| VRH8771 | 3 | 61 | 11.2 | 5.4 |
| NAB | 1 | 3200 | 17.5 | 182.9 |
| NAB | 2 | 1650 | 9.5 | 173.7 |
| NAB | 3 | 628 | 16.9 | 37.2 |
| Harmony | 1 | 5425 | 9.8 | 553.6 |
| Harmony | 2 | 3875 | 16.5 | 234.8 |
| Harmony | 3 | 24675 | 8.1 | 3046.3 |
| 8771xCS-14 | 1 | 2875 | 9.8 | 293.4 |
| 8771xCS-14 | 2 | 6400 | 13.0 | 492.3 |
| 8771xCS-14 | 3 | 13725 | 18.5 | 741.9 |
| 8771 x CS - 28 | 1 | 481 | 33.4 | 14.4 |
| 8771 x CS - 28 | 2 | 3250 | 41.2 | 78.9 |
| 8771 x CS - 28 | 3 | 2025 | 44.7 | 45.3 |
| 8772 x CS - 225 | 1 | 6175 | 12.2 | 506.1 |
| 8772 x CS - 225 | 2 | 6975 | 14.8 | 471.3 |
| 8772 x CS - 225 | 3 | 10825 | 10.1 | 1071.8 |
| 8775 x CS - 236 | 1 | 2967 | 14.5 | 204.6 |
| 8775 x CS - 236 | 2 | 13975 | 34.0 | 411.0 |
| 8775 x CS - 236 | 3 | 13325 | 15.2 | 876.6 |