

Root knot nematode control evaluations, and Characteristics of *Mi* resistance-breaking populations in California

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New nematicidal products in development: tomato field data 2011-2015

Disease rating scale 0-10 (Zeck, 1971)



Roots from SCREC 2015 trial rated 0-9 for galling (left to right)

New nematicidal products
in development: tomato field trial 2014



Nt check

Nimitz

Vydate

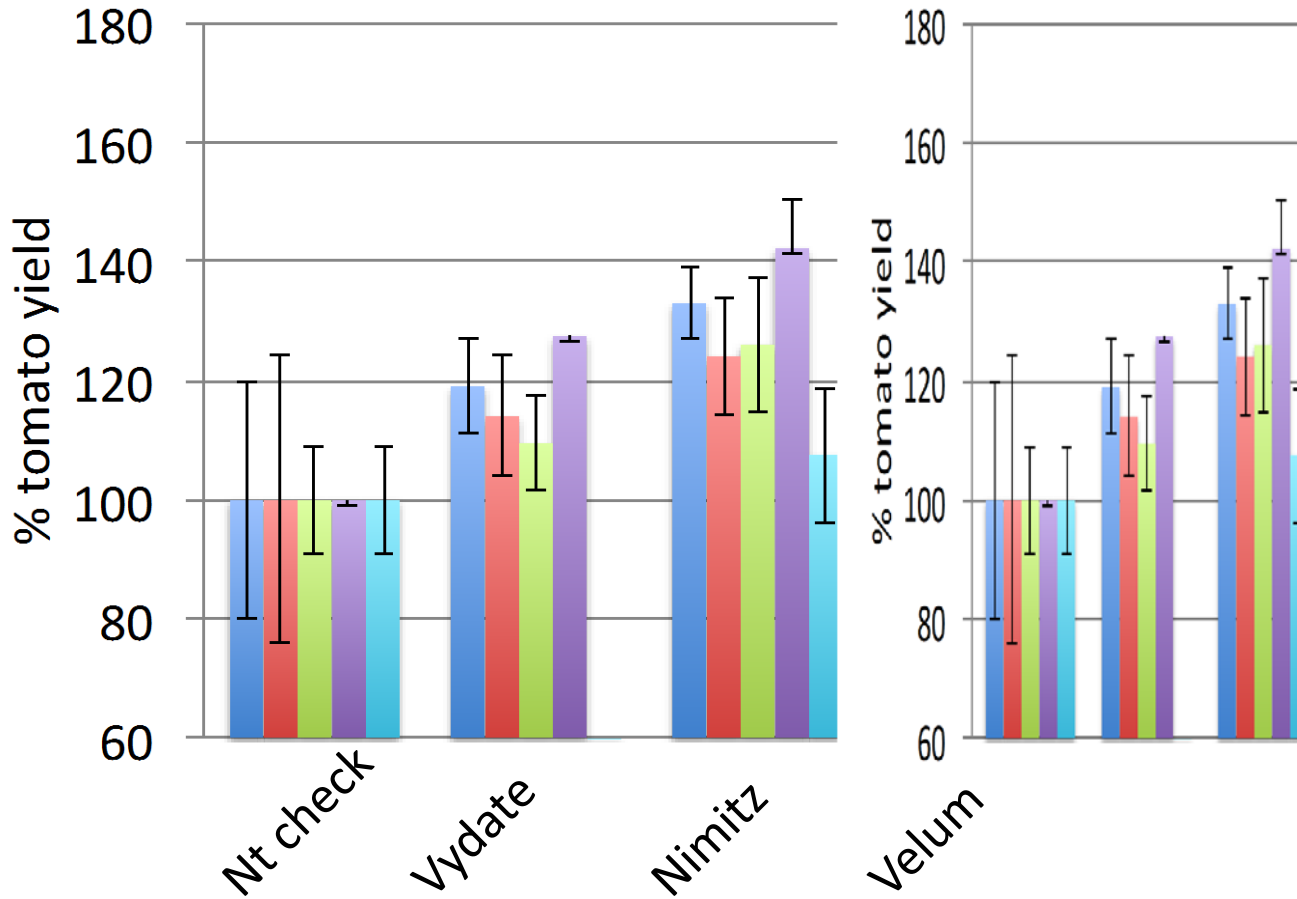
New nematicidal products
in development: tomato field data 2011-2015
Symptoms

South Coast R&E Center

treatments	2011	2012	2013	2014	2015
	rkn disease ratings*				
nt check	7.1 c	7.7 b	7.6 e	9.1 d	5.8 c
Nimitz EC	3.1 a	6.4 a	4.9 bc	3.4 a	4.3 b
Velum	—	—	—	4.9 b	2.7 a
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Velum	—	—	—	4.9 b	2.7 a

New nematicidal products in development: tomato field data 2011-2015

Yield



New nematicidal products (& in development):

- Nimitz (Adama): fluensulfone, 0 REI, CAUTION, 7d pre-plant, 3.5-5 pt/a
- Velum One (Bayer): fluopyram, 0 REI, CAUTION, 7d at-plant, approx 6 pt/a
- Q8U80 (DuPont): fluazaindolizine, ? REI, CAUTION?, at-plant?, approx 60 oz/a or 40 lb/a

All for conventional production, non-fumigants

Root-knot nematodes (Meloidogyne):

- *above-ground symptoms: anything that indicates damaged root function (wilting, yellowing, early-dying, stunting), Fusarium, Verticillium.*
- *root-symptoms: galling, rotting.*

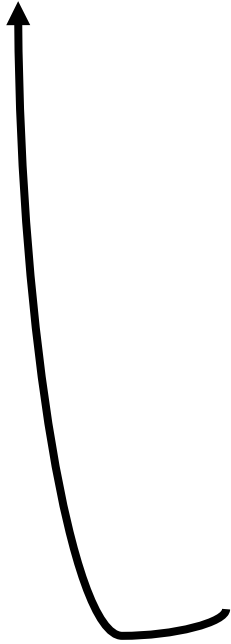
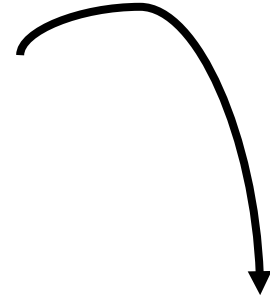


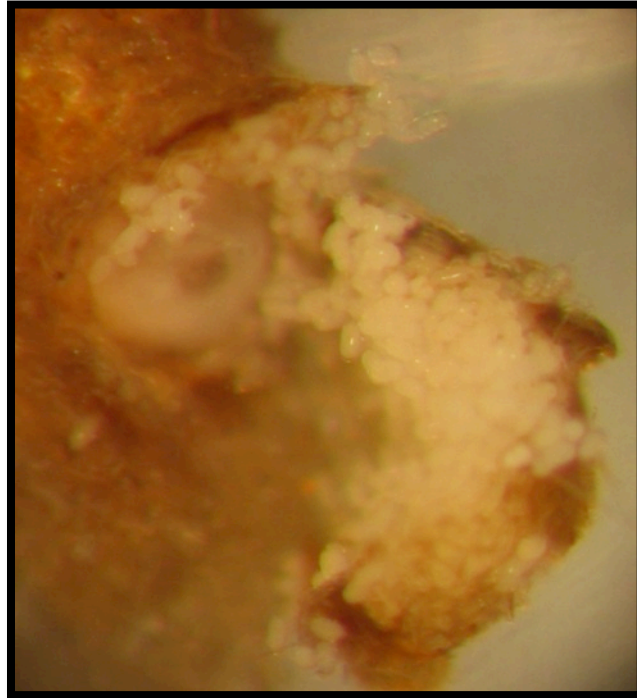


S



R



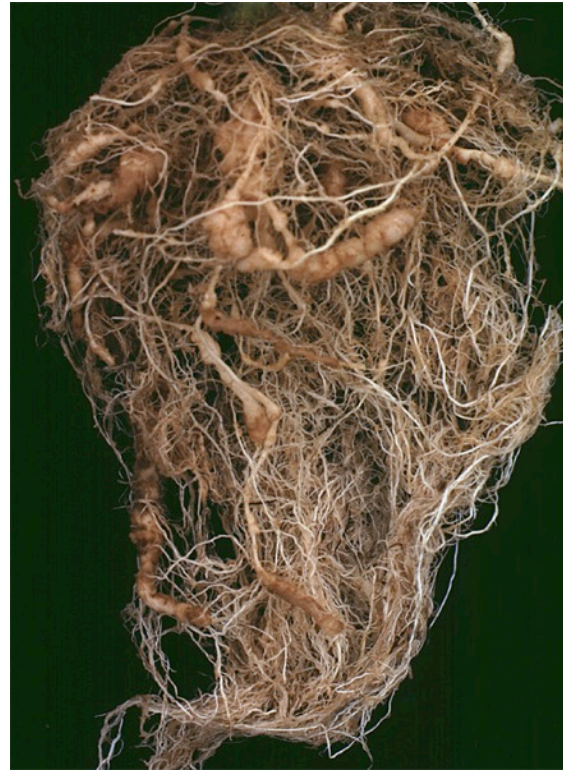


Resistance to RKN (*Meloidogyne*): variable??

Because of differences between tomato vars., RKN populations, or both?



SUSCEPTIBLE



RESISTANT1



RESISTANT2

Field sample extraction



Inoculation on 'Daniela' (S) and
'Celebrity' (R).



If symptoms and multiplication on both
then



Single egg mass culture on 'Celebrity' (R)



Multiplication, and J2 used in
experiments



Tomato varieties:

Daniela (S control)

Celebrity (R control)

H5608 (R)

DR1319 (R)

N6366 (R)

HM3887 (R)

H8504 (R)

} processing

RKN populations:

M. incognita control

3 - Woodland

4 - Bakersfield

10 – San Joaquin

11 - Woodland

12 - Woodland

1k J2/pot

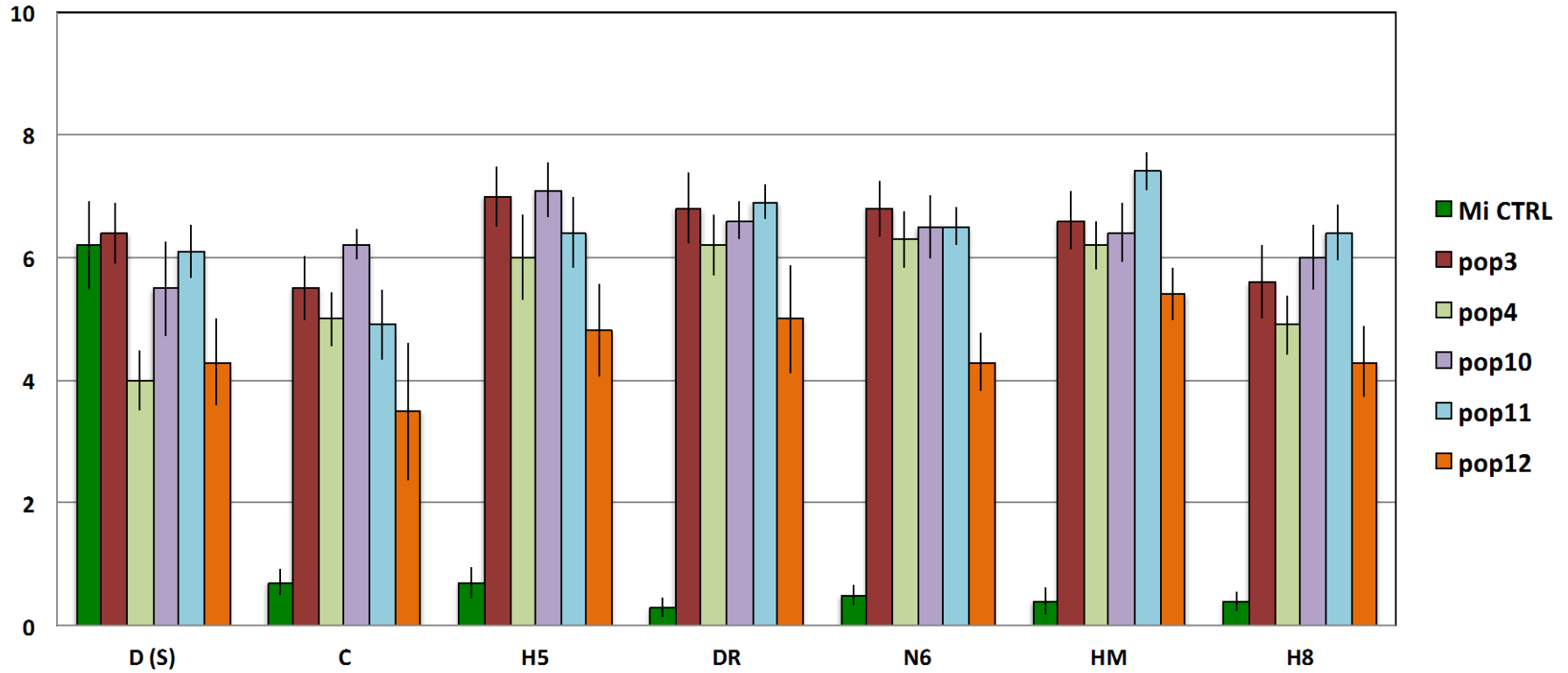
6 wks

5 reps

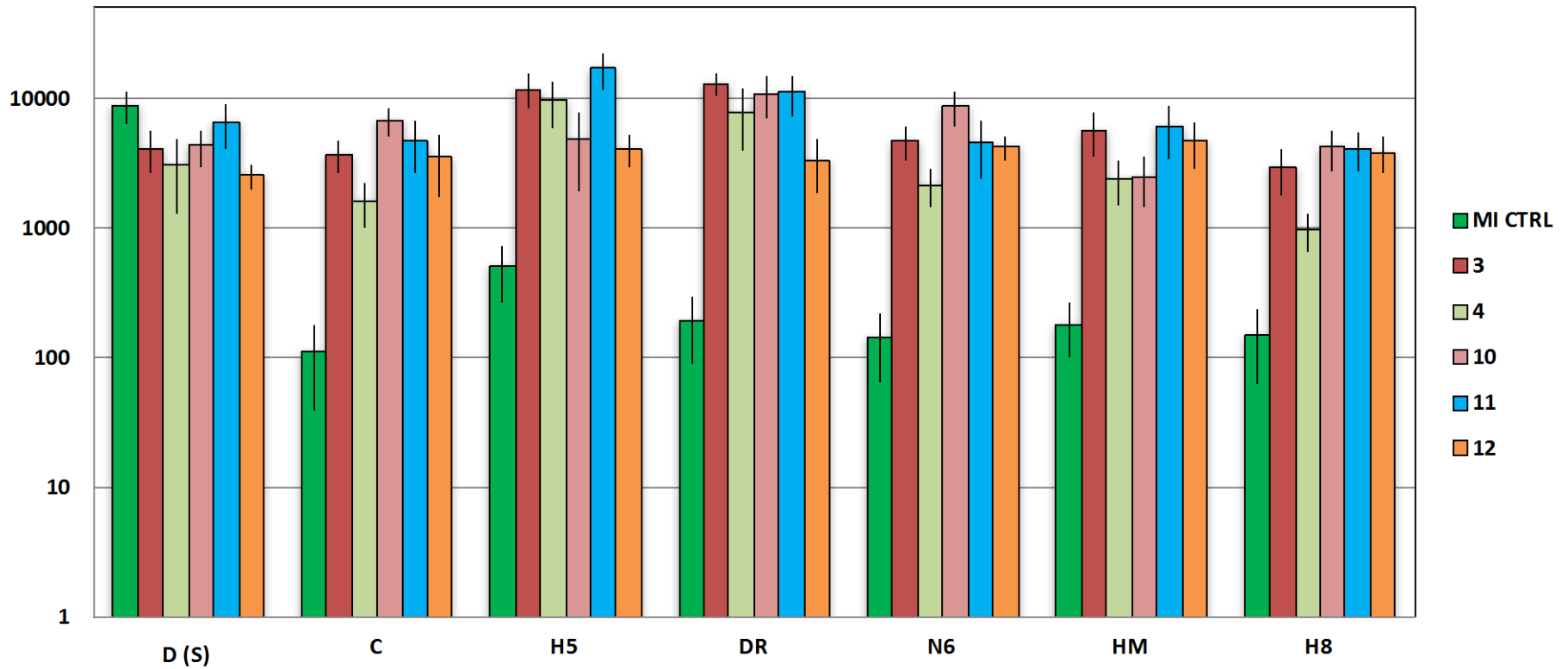
Exp 2x



Root galling on tomato vars. inoculated with different RKN populations



RKN J2 on roots of different tomato vars inoculated (1,000 J2) with different RKN populations



Overall Conclusions:

- Nearly all of the populations collected were able to break resistance
- So far, only *M. incognita* has been identified.
- Degree of galling is similar for all tomato varieties
- Resistance-breaking population nr 12 causes slightly less galling than others
- Nematode reproduction is very similar on all tomato varieties
- Resistance-breaking populations reproduce equally well on tomato varieties.

Future research:

- Are resistance breaking populations also able to break other resistance genes? (eg pepper, cowpea, cotton, bean)