



Late blight in Vietnam; pathogen population, host specificity and control

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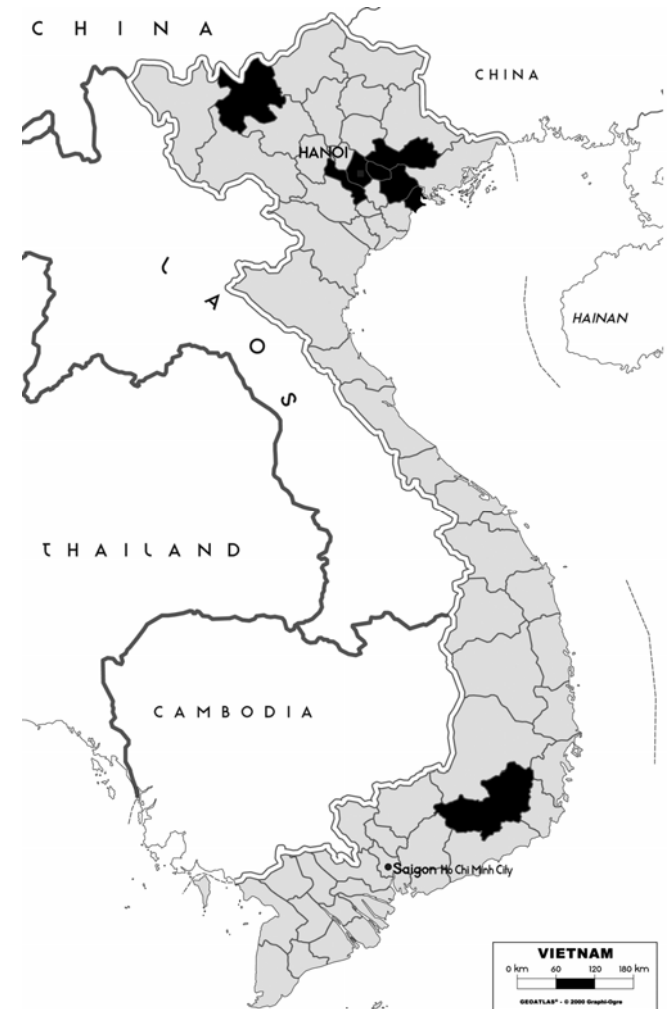
Content

- ✓ Late blight in Vietnam
- ✓ Late blight population studies
- ✓ Field experiments with IPM strategies
- ✓ Growth chamber experiments on aggressiveness



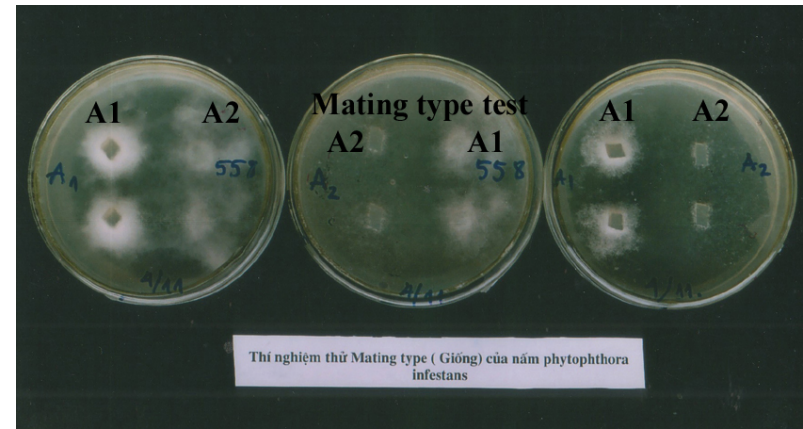
Late blight in Vietnam

- ✓ Winter season (November-March) in the North
- ✓ All the year around in Lam Dong province in the South
- ✓ Fungicide application; up to daily if rain, longer interval in the north
- ✓ Crop losses variate between 0-100%
- ✓ Isolates collected in 2002-2003 (590 isolates): Vietnam still have the "old" population of *P. infestans* which was distributed worldwide outside central Mexico before 1970's; mating type A1 and mtDNAhaplotype Ib

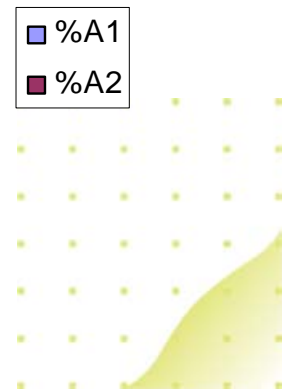
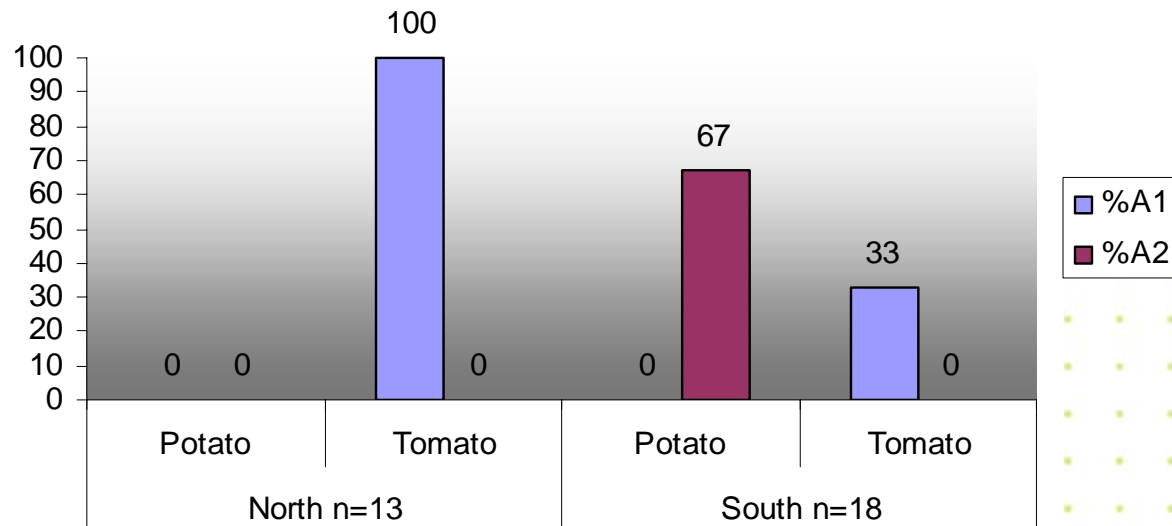


Population change

- ✓ Isolates were collected from potato and tomato fields in 2007
- ✓ Tested isolates (31) was paired with 2 standard isolates of A1 and A2



Mating type of 31 tested isolates from 2007



Aggressiveness test in growth chamber

Test the hypotheses:

- ✓ Isolates from tomato or potato in Vietnam are most aggressive on the host plant they are isolated from

Isolates of *P. infestans* collected from potato and tomato from North and South Vietnam were tested for aggressiveness on leaflets and leaf discs of susceptible cultivars of potato and tomato

Optimal humidity, 18°C and 12 hours dark/light in 7 days

- ✓ Latency period (LP)
- ✓ Lesion growth rate (LGR)
- ✓ Sporulation capacity (SC)
- ✓ Frequency of infectious sporangia (FIS)



Aggressiveness test in growth chamber

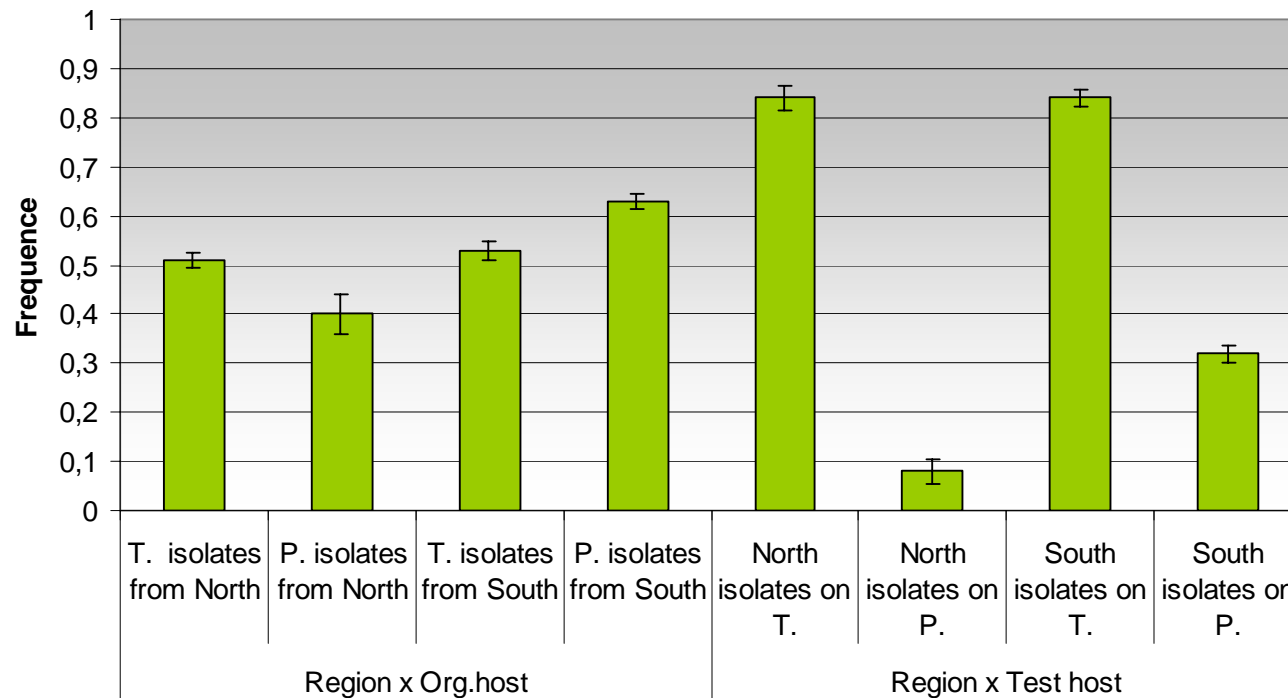
Location	Isolate	
	Tomato	Potato
North	19	3
South	14	17

- ✓ Total 53 isolates tested
- ✓ 795 leaflets were tested per host
- ✓ 7950 leafdiscs were tested per host



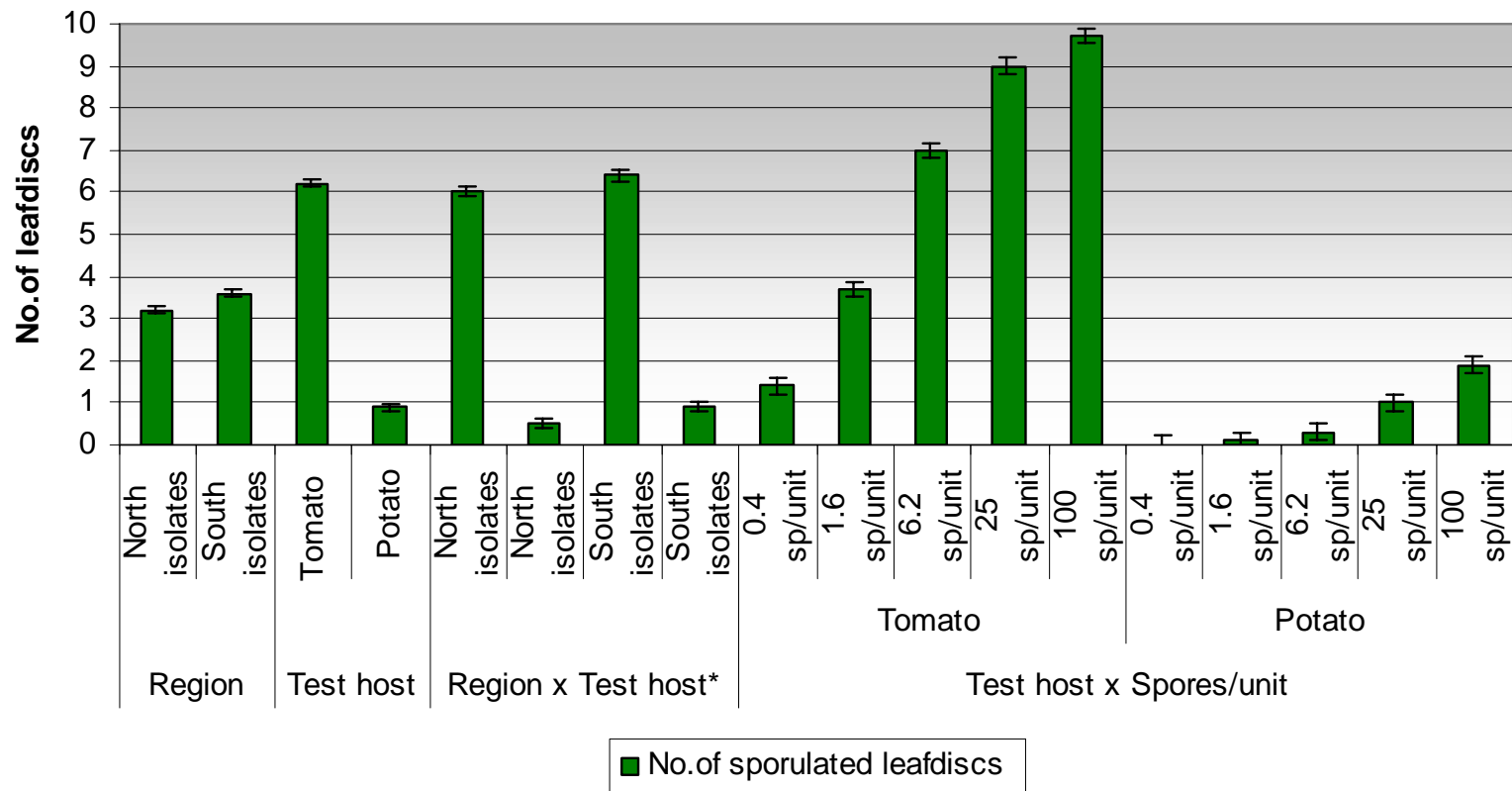
Results

Frequency of sporulation on leaflets during the test

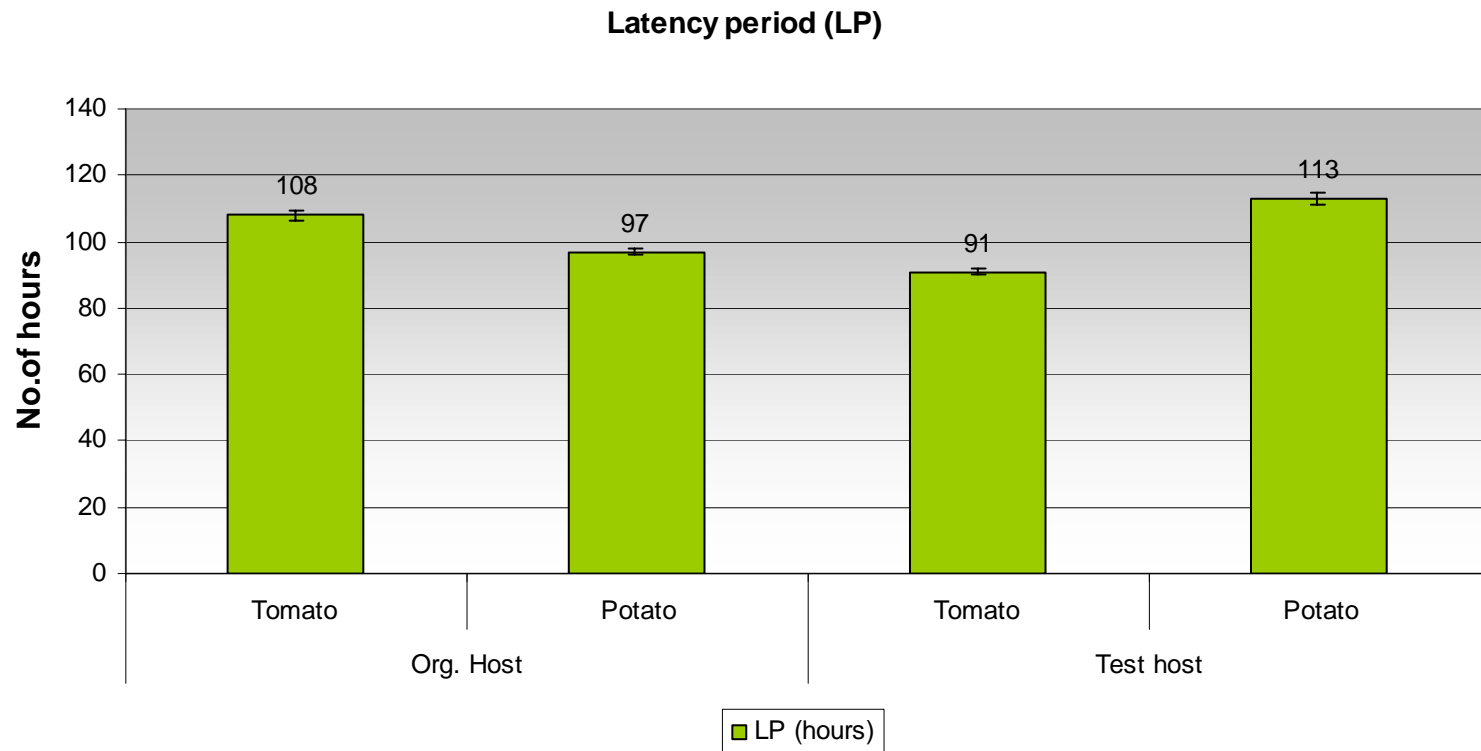


Tomato isolates from north and south

Frequency of infectious sporangia(FIS)



Potato and tomato isolates from the South of Vietnam



Short conclusion from Aggressiveness test

- ✓ Few isolates sampled from tomato infected potato leaves
- ✓ Most isolates sampled from potato infected both tomato and potato leaves, but were more aggressive on tomato
- ✓ Practical conclusion; more risky to plant tomato close to an late blight infected field of potato than the opposite



IPM field experiments

- ✓ Potato: in the South
- ✓ Tomato: in the North and South
- ✓ Experimental design: Randomized Complete Block
- ✓ Cultivars: 3 (different level of late blight resistance)
- ✓ Fungicide treatments:
 1. Control
 2. Fungicide 1/1 dose - 7 days int.
 3. Fungicide ½ dose - 7 days int.
 4. Fungicide 1/1 dose - 1 misty day or 25mm rain
 5. Fungicide 1/1 dose - 2 misty days or 50mm rain



Tomato fields in Lam Dong



IPM

Farmers spray practice

- ✓ Fungicide; Mancozeb (2kg/ha= 1/1dose)
- ✓ One trial in dry season 2005-2006
- ✓ Two trials in rainy season (one in 2005 and one in 2006)
- ✓ All three trials died early caused by heavy infection of late blight

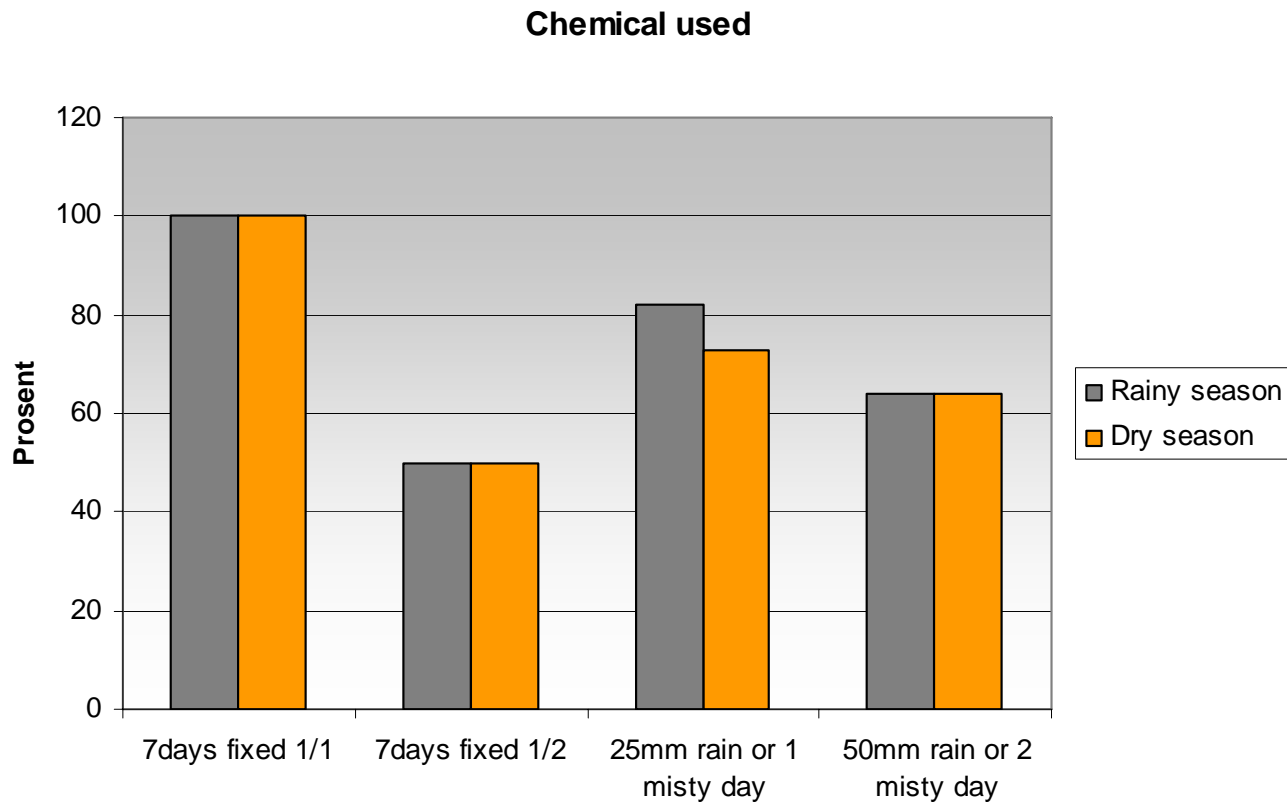


Tomato fields in the North

- ✓ Total 6 field trials carried out in the North, in the winter seasons 2005-2008
- ✓ No fields had natural infection of late blight
- ✓ 2 field trials were artificially infected by late blight and are still under harvest



Potato experiments (4 trials in Lam Dong)

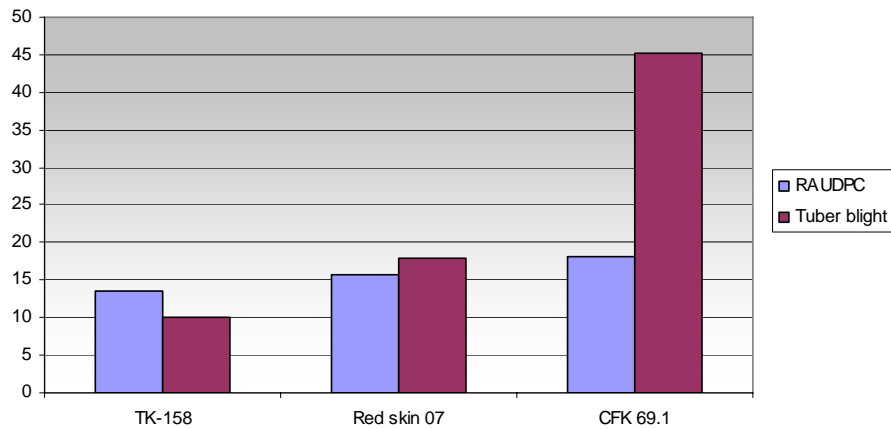


Fungicide; Fluazinam (300ml/ha) = 1/1dose

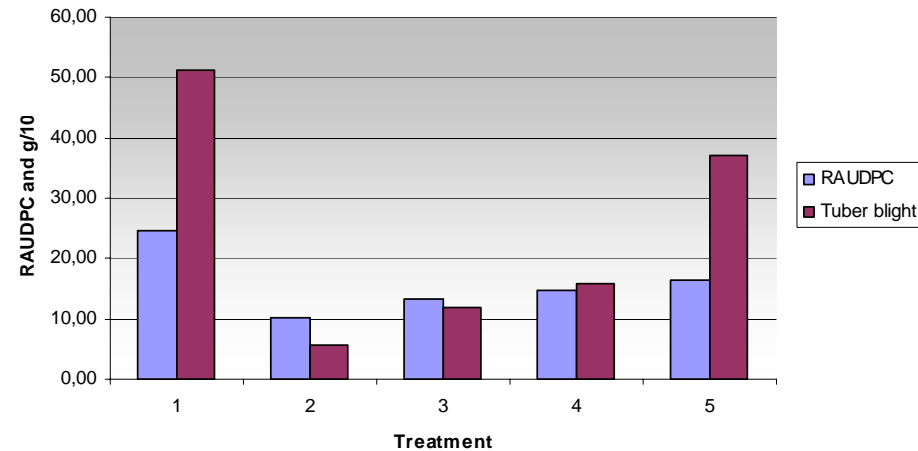


Potato experiments (4 trials in Lam Dong)

Late blight in the foliage (RAUDPC) and tuber blight (g/10 per plot)



Late blight in the foliage(RAUDPC) and tuber blight (g/10 per plot)



Conclusion of field trials

- ✓ Tomato; weekly sprays with mancozeb 1/1 dose could not control late blight in the South
- ✓ Late blight was a minor problem on tomato in the North
- ✓ Potato; weekly sprays with fluazinam ½ dose showed good control of late blight. Use of 25mm rain or 1 misty day as spray trigger for 1/1 dose fluazinam was effective but resulted in more fungicide use
- ✓ Potato; the same strategies seems not to be effective against late blight when mancozeb is used (data are still in progress)





This work was a part of the project "NORAD RAS 2016 – Integrated Pest Management (IPM) – Vietnam" which was supported by grants from The Norwegian Agency for Development Cooperation (Norad)



Thank for your attention!

