Phytophthora kernoviae

Overview for FBCC

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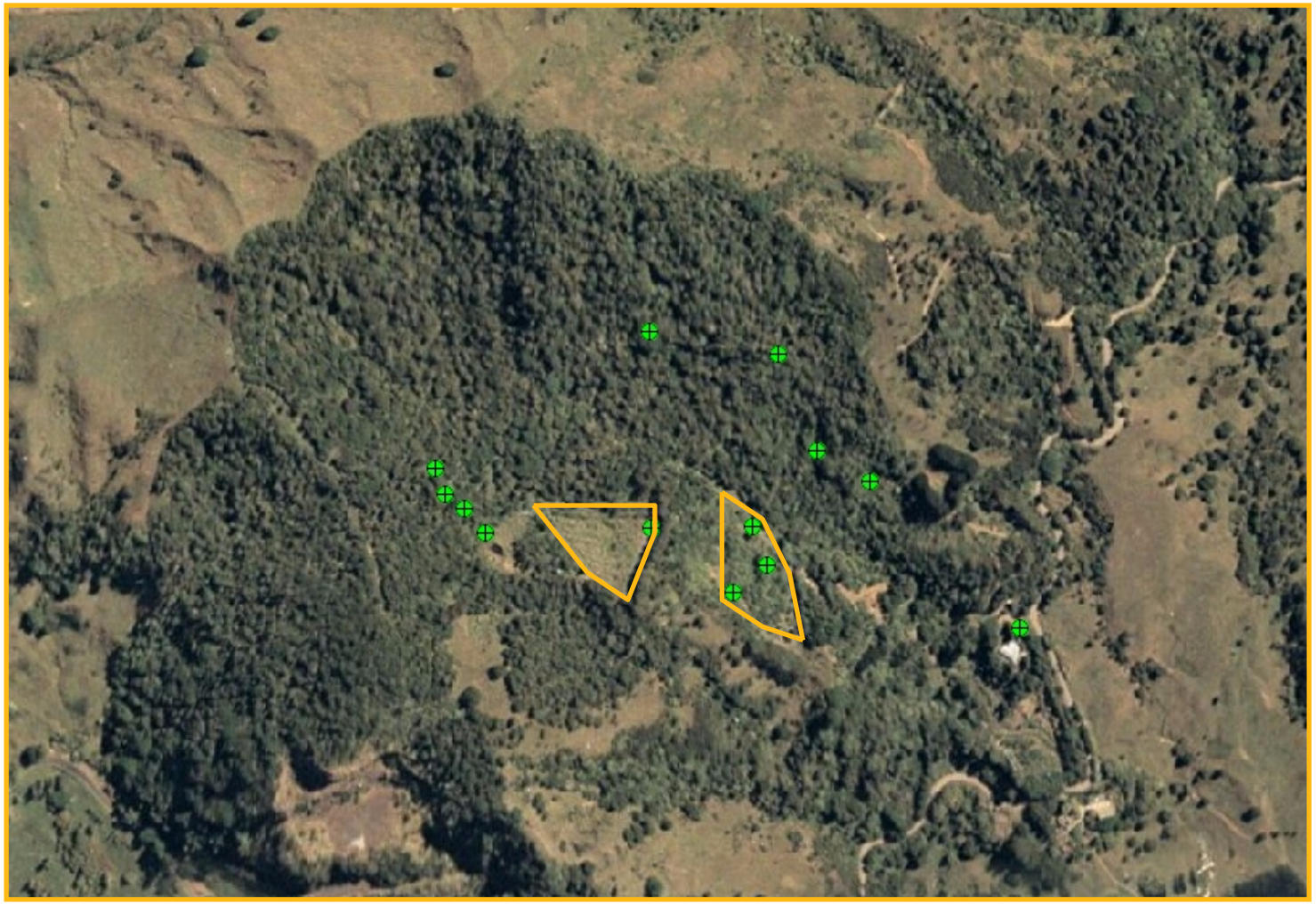
Background – original site

- Detected as a result of MAF research project to determine status of *Phytophthora* in New Zealand
- Original sample submitted by a cherimoya grower in September 2002
  - Plants displaying symptoms since early 1990s
  - No crop since 1999
  - Orchard surrounded by native bush
  - Perception of disease “coming out of the bush”
  - Originally identified as *P. hibernalis*
  - Orchard no longer being managed – reverting to bush
  - No plant/soil material coming off site
  - Restricted access



Kohukohu Orchard. (Photo provided by Northland Regional Council)

Kohukohu orchard showing cherimoya tree

Kohukohu cherimoya orchard

Affected cherimoya tree. Note mummified fruit.

Background – Trounson site

- Detected in a soil sample collected from Trounson Kauri Park in 2003.
  - Samples collected as part of an investigation into kauri die-back.
  - 74 samples, 30 *Phytophthora* and 1 unidentified *Phytophthora* species.
  - Collected from a site near a long dead kauri, alongside a disused track (closed 93/94).
  - No plant/soil material leaving the site; restricted access.
  - Trounson is 450 Ha primary forest surrounded by pastoral land.
  - No links between cherimoya property and Trounson Park.
  - DoC administered, hygiene (Trigene) procedures in place.
  - Important to note *P. kernoviae* has not been isolated from kauri tissue

Trounson Kauri Park. Historical 2002 sample site indicated.
(Photo provided by Northland Regional Council)

Activities

Several objectives

1. Determine/confirm presence of *P. kernoviae* at affected sites
2. Determine any links between *P. kernoviae* in soil and lesions on kauri at Trounson Kauri Park
3. Determine spread of *P. kernoviae* around positive sites
4. Trace forward from infected sites
5. Determine whether kauri die-back on Great Barrier, and other areas is associated with *P. kernoviae*
6. Form Technical Advisory Group (TAG) to assess current scientific knowledge and make recommendations to BNZ

Results of survey work

- 115 samples collected (exclusive of material collected at Great Barrier and west of Auckland)
- *P. kernoviae* confirmed still present in cherimoya orchard at Kohukohu
- Failed to detect *P. kernoviae* at Trounson (even at P7)
  - False negatives?
- No links between the two sites
- No further detections of *P. kernoviae* around the positive sites
- No links between soil samples and lesions on kauri

Tracing Activity

- Forward trace of cherimoya material (budwood)
  - 1 positive detection from soil at Whangarei
  - Other sites negative
  - Many trees destroyed (growers reported problems with “fungi”)
- Backward trace
  - Negative at Kaitaia site
  - “Many thousands” of cherimoya distributed throughout northern NZ
- MAF sub-tropical surveys did not detect *Phytophthora* species in cherimoya

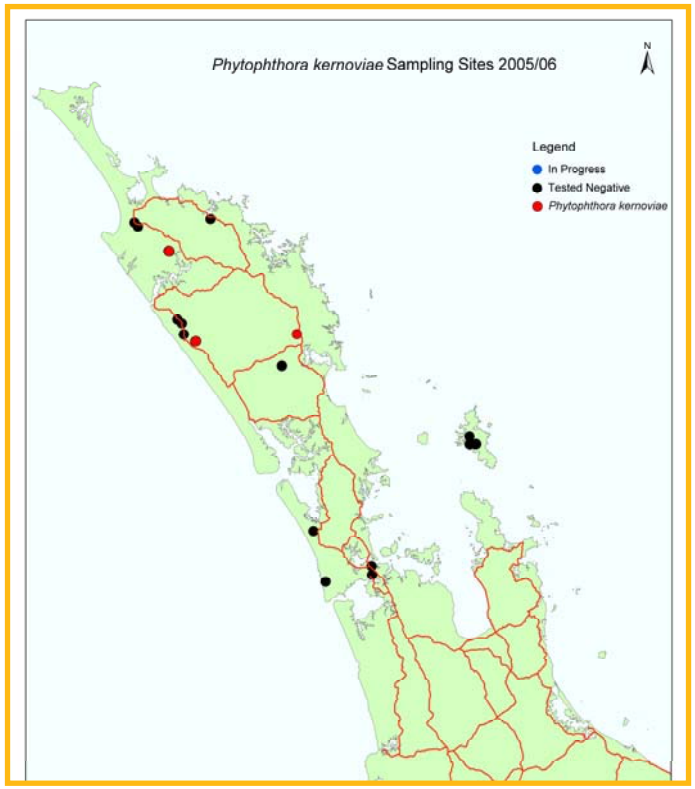
Results of survey work

- Great Barrier Island
  - *P. kernoviae* not detected.
  - *Phytophthora* sp (near *katsurae*) ex *Agathis*

- Maungaroa Ridge and Titirangi sites
  - *P. kernoviae* not detected.
  - 2 specimens of *Phytophthora* sp. (near *katsurae*) from Maungaroa

- Trounson and Waipoua Forests
  - *P. kernoviae* not detected.
  - *Phytophthora* sp. (near *katsurae*)

P. kernoviae is not linked to kauri die-back on Great Barrier, at sites near Auckland nor in the Waipoua – Trounson area in Northland.



Sites sampled to 30 June 2006
(Map courtesy of Northland Regional Council)

MAF BIOSECURITY NEW ZEALAND

Recent detections of *Phytophthora* species in New Zealand

Phytophthora sp.	Date	Collected from	Location
P. kernoviae	Dec 05	*Annona cherimola*, Soil	Northland
P. "agathis" sp. nov.	1972, 2006	*Agathis australis*	Auckland
Phytophthora. sp. nov.	Apr 2006	Soil	Northland
*P. captiosa**	1992	*Eucalyptus* spp.	Bay of Plenty
*P. fallax**	1997	*Eucalyptus* spp.	Taupo, Dunedin, Southland
P. europaea	2002	*Iris sibirica*	South Canterbury

* Dick, M.A., et. al. 2006. *Mycological Research* 110: 393-404

TAG

- Unable to resolve native/exotic status with current knowledge.
  - Treat as an exotic until we know otherwise
- Research required to develop reliable detection methods
- Research into host species
- Spring potentially optimum time for further survey work (foliar symptoms).
- Potential use of bait plants (cherimoya?).
- Modified sampling within Trounson
  - Involves sampling at putative positive sites over a period of time.
- Diagnostic laboratories to test for *P. kernoviae* where *Phytophthora* spp. are suspected in submitted samples.

Future Work

- Unvalidated report of “Tokoroa Phytophthora”
  - Considered a new species (~1970)
  - Also a low temperature species (as is *P. kernoviae*)
  - Collected 1953, 1956 and 1968/69
- BNZ commissioned work
  - Grow known *P. kernoviae* on same media
  - Make comparison with 1970s MSc thesis descriptions
  - Provide overseas experts with thesis
- Use for input into spring work

Future Work

- Prepare information for field surveillance activities
  - Description of symptoms
    - What are the symptoms?
    - Are symptoms different on different hosts?
    - Appropriate time for sampling
- Survey for freedom – export assurances