

Lumpy Skin Disease in Israel 2012-2013



Nadav Galon, CVO Israel

Alexandroupolis Greece 06-03-2015



Overview

- Israel – country, cattle and VS
- Prior to the outbreak
- The 2012-2013 outbreak
- control
- Dilemmas and plans

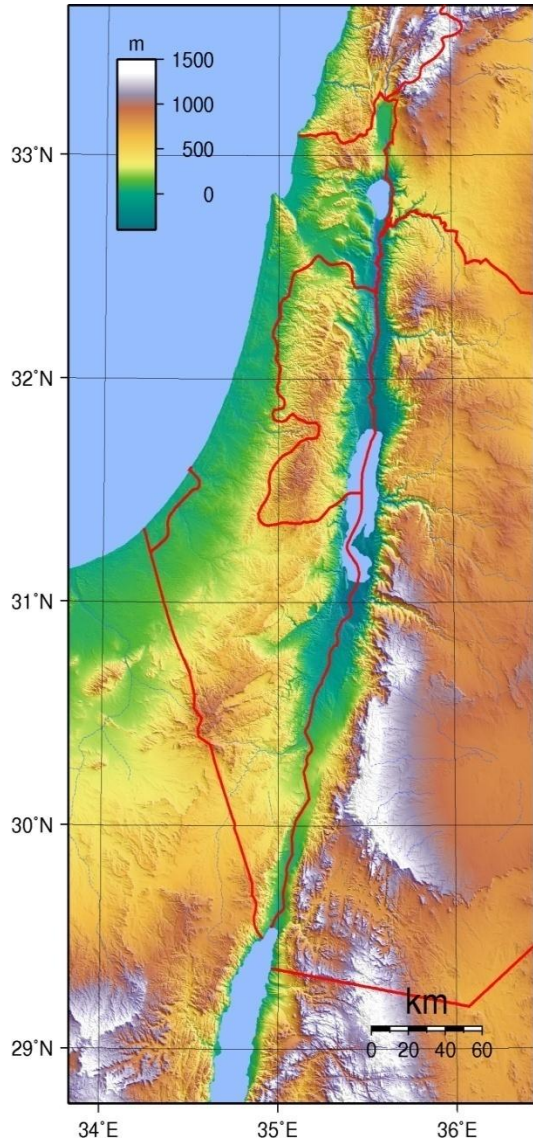


ISRAEL



- Est. 1948
- 9 Million people
- 27,000 km²
- Coast densely populated
- 20% minorities
- 2% farmers

Altitude



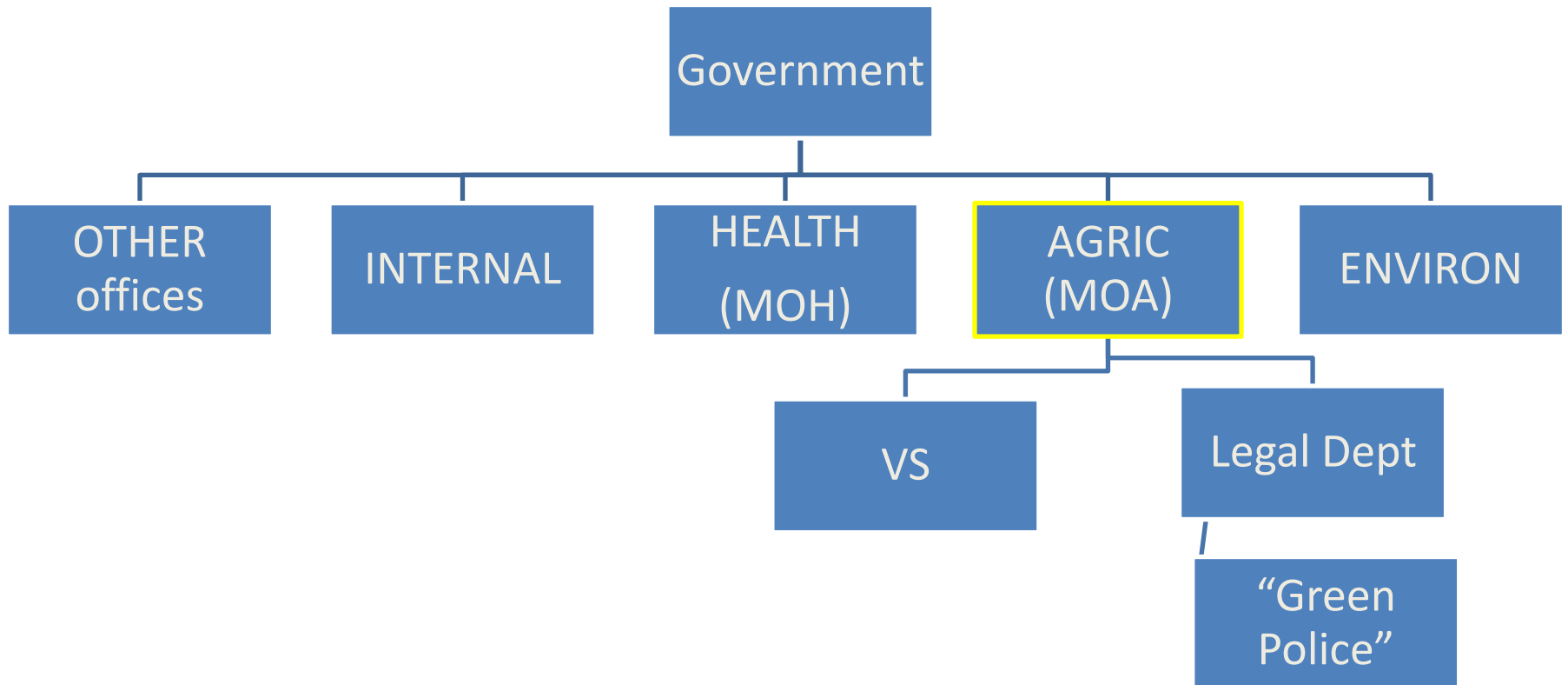
Rainfall



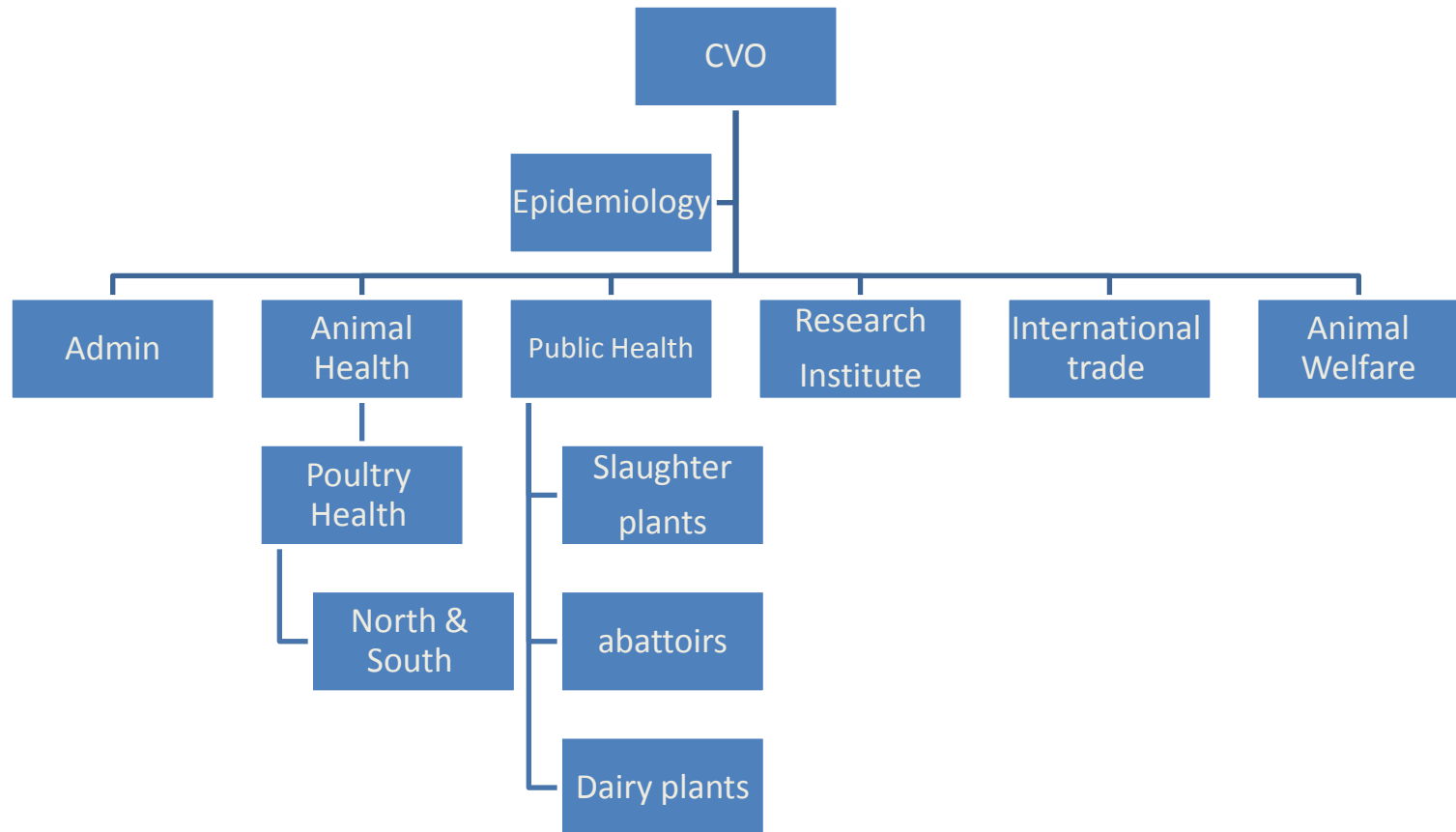
Temp



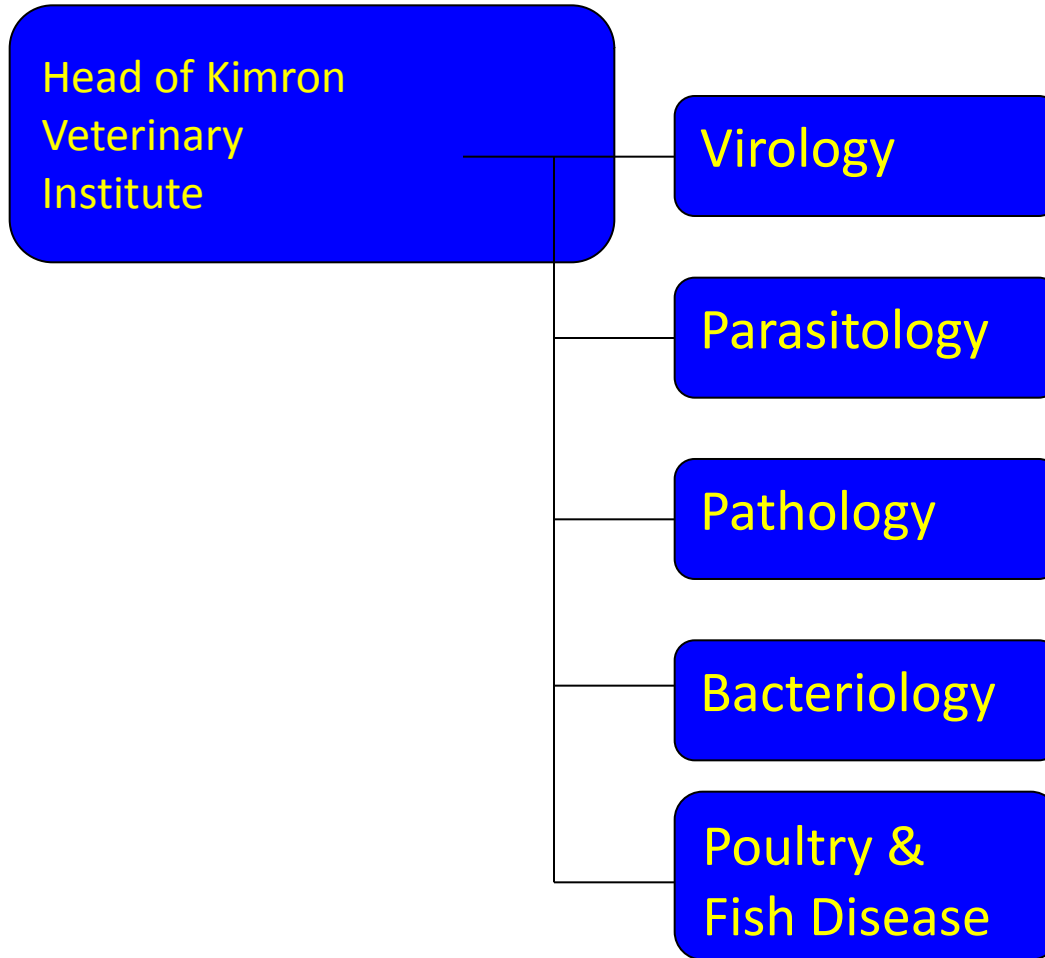
VS positioning



VS Organogram



Kimron Veterinary Institute

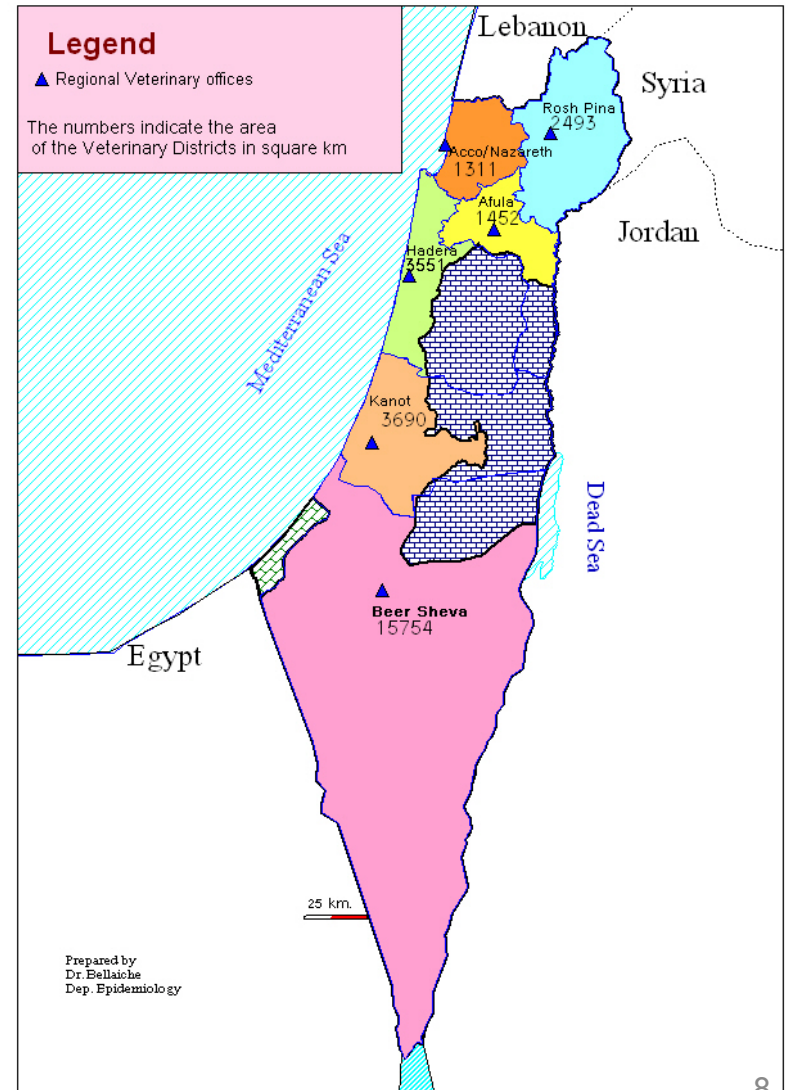


Field Veterinary Services

6 Veterinary Districts

- DVO -6
- Vets - 33
- Inspectors – 14
- Total - 53

The Field Veterinary Districts



National cattle population (at risk)

Type	Herds	Heads (~)	Farm size
Dairy Farms	828	250,000	40-1,100
Feedlots	457	200,000	50-6,000
Pasture	596	60,000	20- 1,000

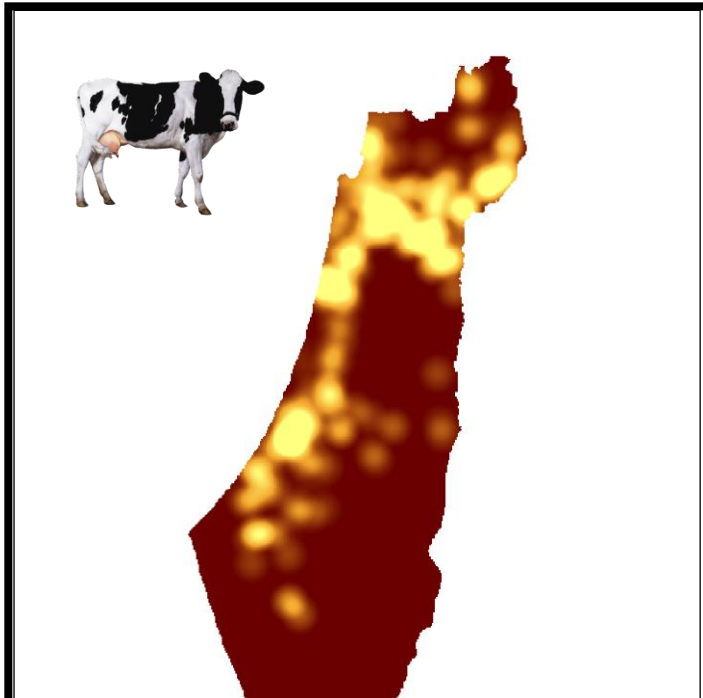


Kibbutz

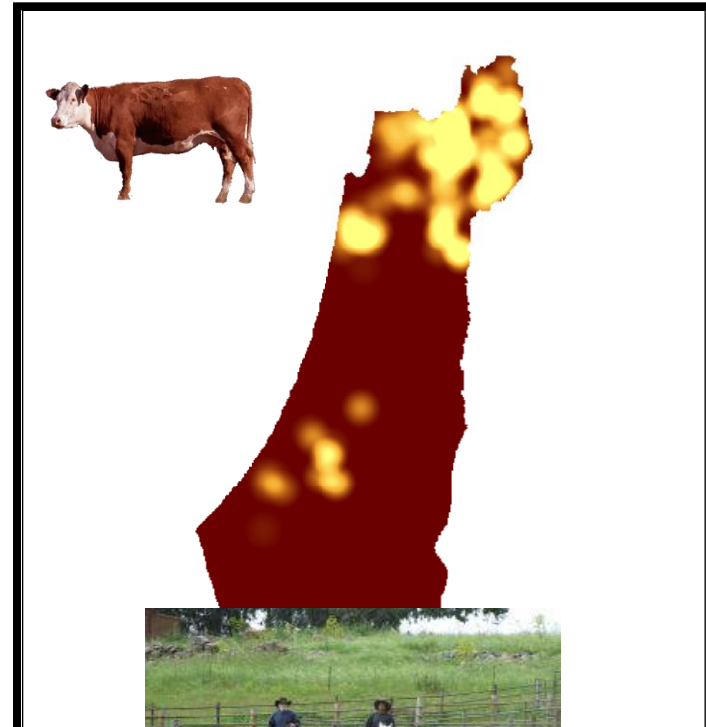


Moshav

Dairy - 0 grazing

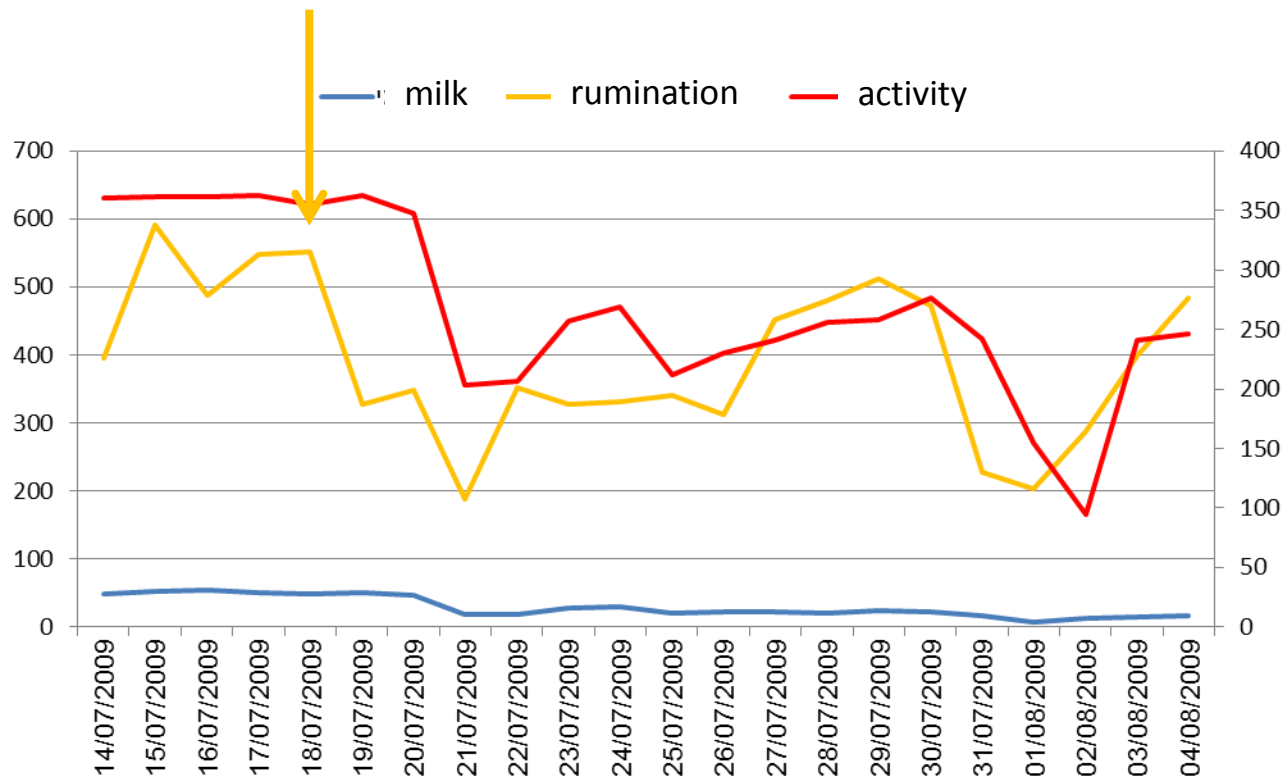


Pasture - 0 housing



Diagnosis of a diary cow with BTV

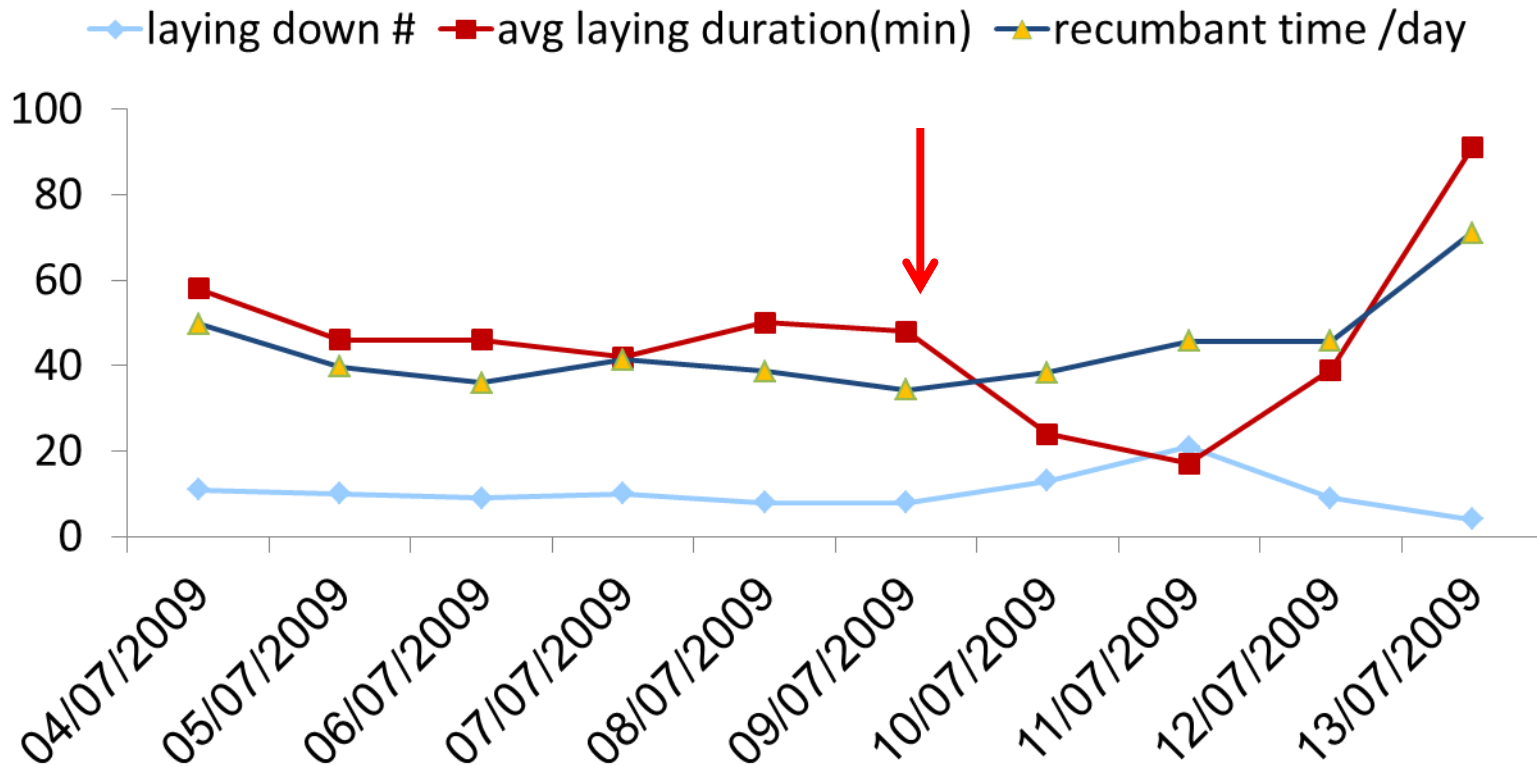
SCR



Intensive dairy herds

Early dx of BEF by Pedometry

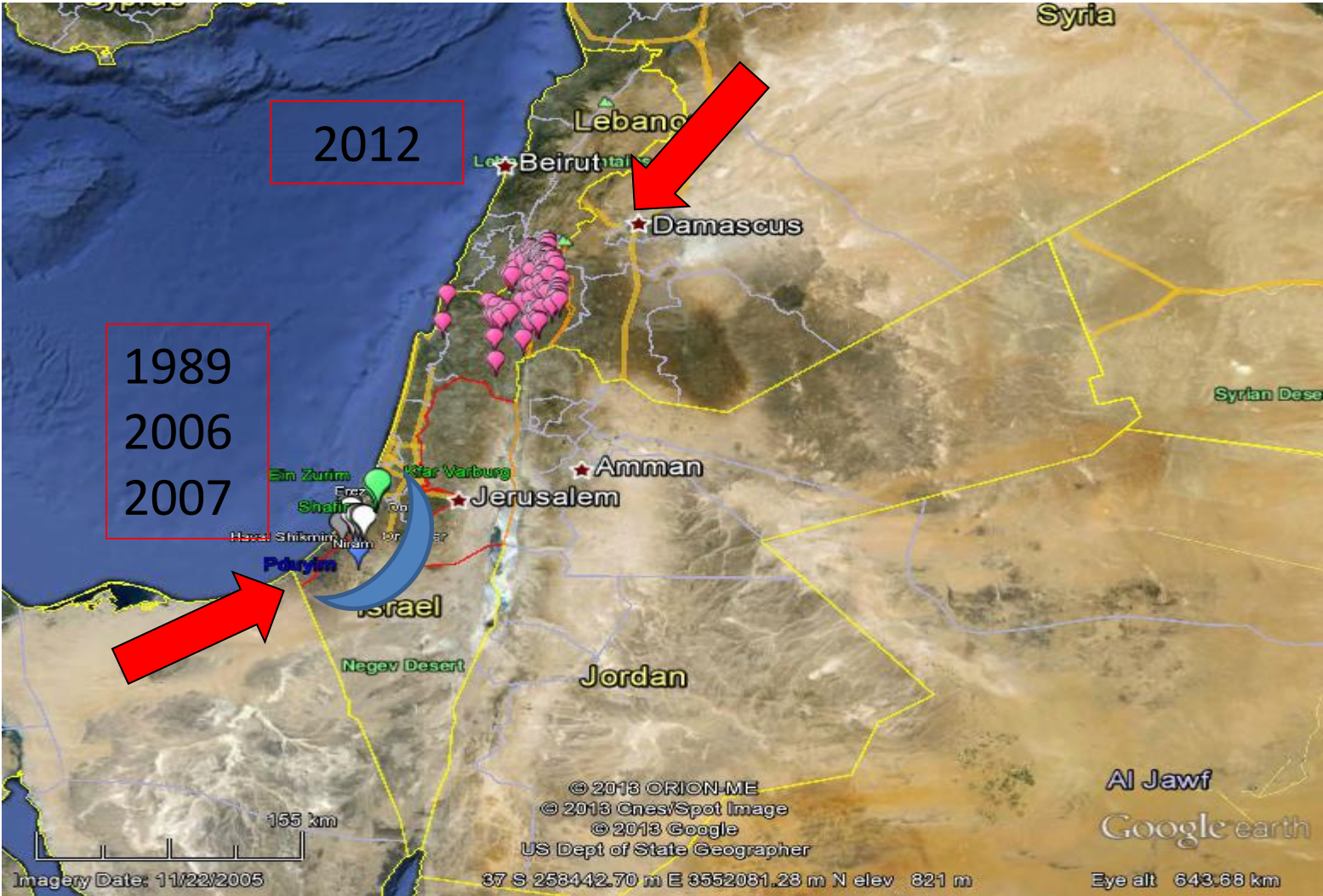
Afimilk



LSD – “Doctrine” until 2012

- It is a trans-boundary summer disease
- The disease comes from South West (Africa)
- The vector is known (more or less)
- Sheep Pox vaccine protects (2006-2012)
- VS can detect and cull the early cases

Previous LSD outbreaks in Israel



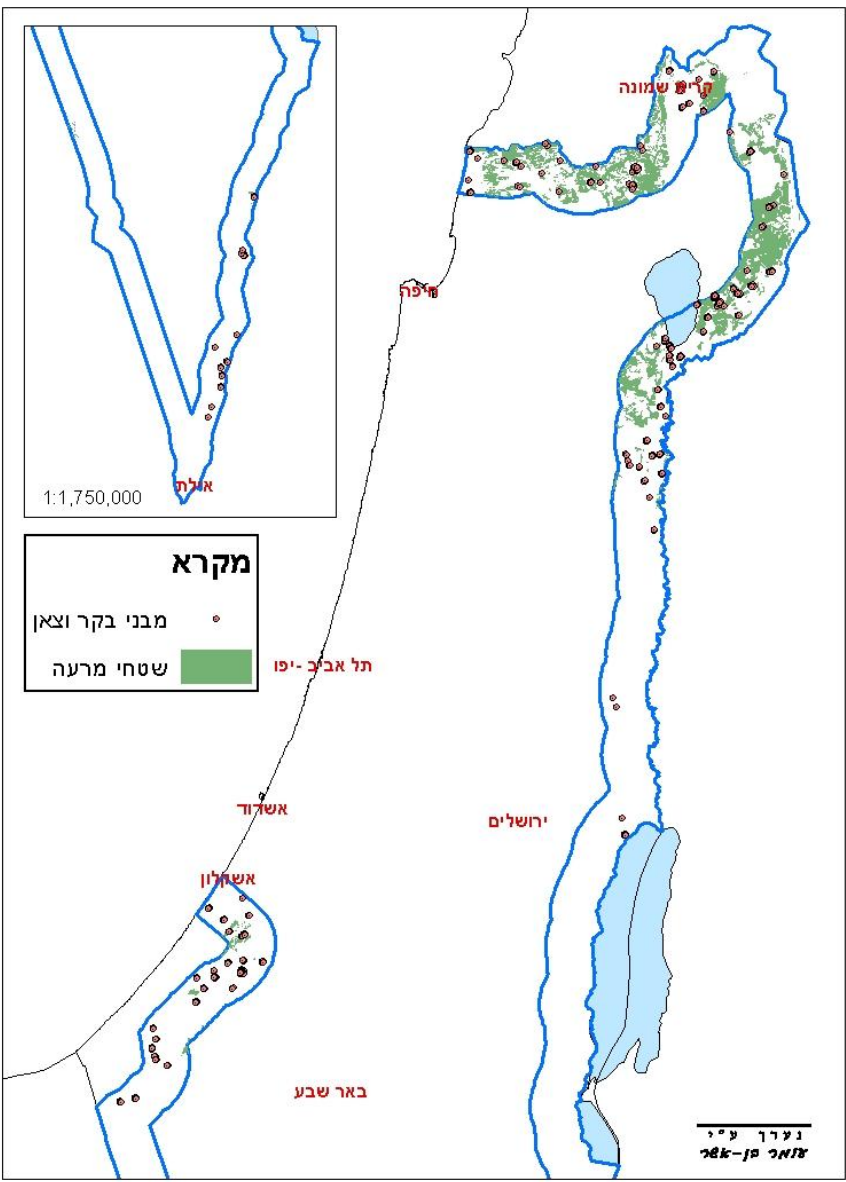


1:975,00

10 km border strip

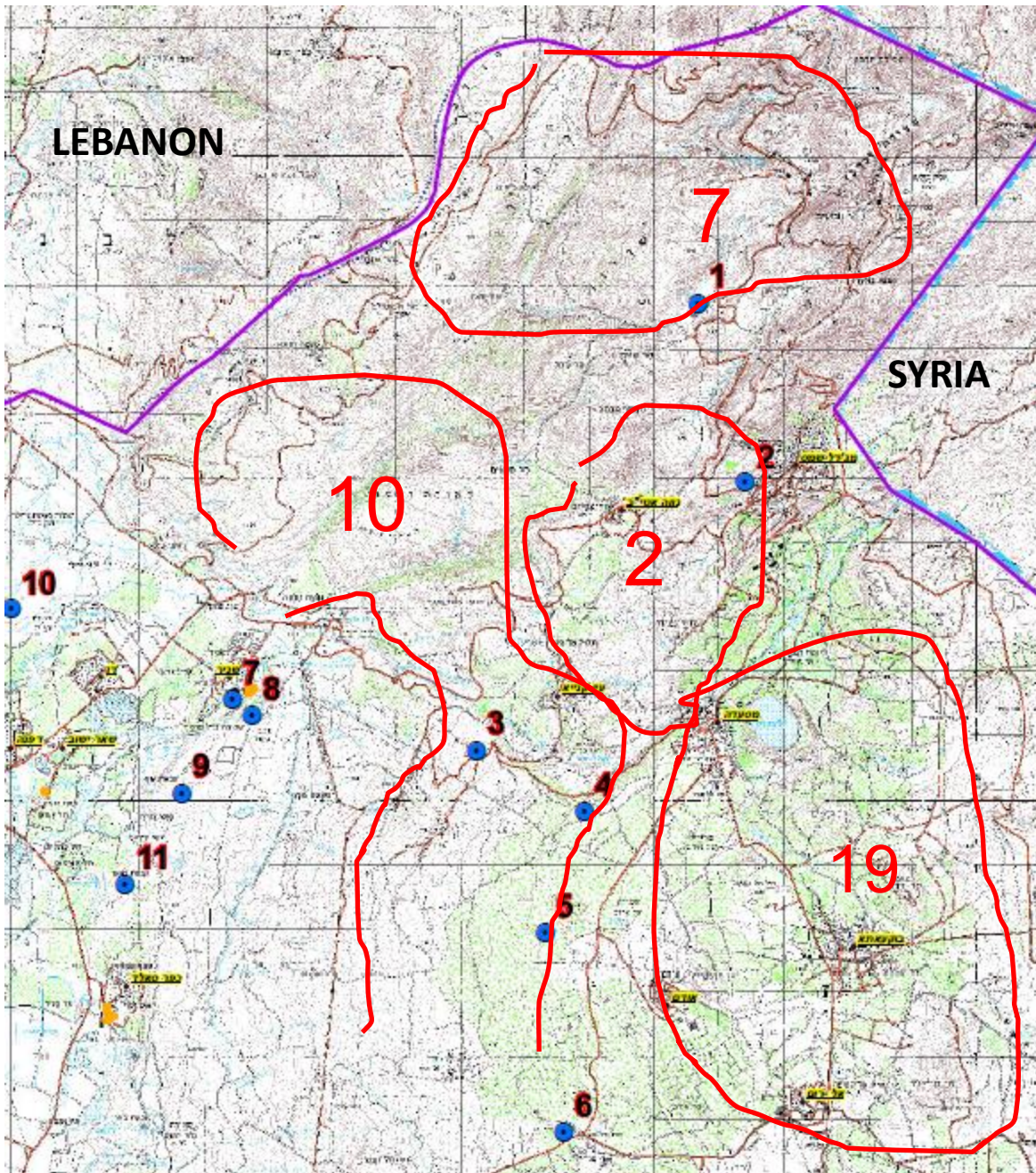


Active Surveillance



Where
 When
 How
 Who- Gov.- Private Vet- Farmer
 Training
 \$\$

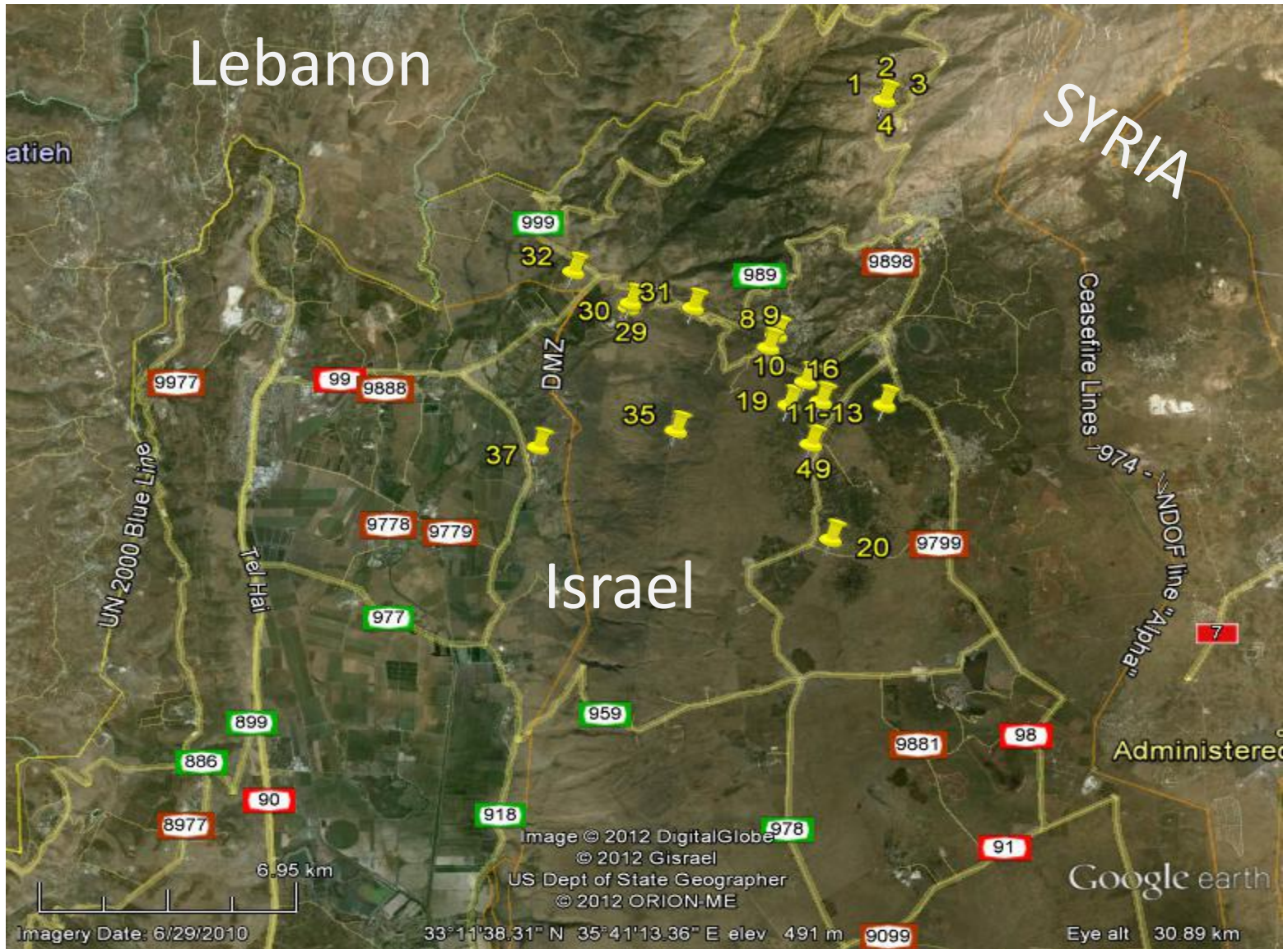




Initial picture
28.07.2012

- ~ 40 Beef herds
- 4,000 cows
- Mutual grazing
- Poor pasture
- Mountains, forests
- Over crowding
- 10-60% morbidity

28 -07-2012



Mediterranean- Alpinic climate



Early Detection ?

6-8 weeks form infection to VS detection

- Remote area
- Beef Farmers differ from dairy farmers
- Rural private vets = sentinels
 - No knowledge of emerging diseases
 - They treat what they know
 - Not reporting
- No enough active surveillance by the VS



Druze cattle farmers Northern Golan Height



Immediate control measures

Beef Herds

- Vaccination – Sheep Pox JOVAC (10^3 1ml s.c.)
- Zoning & Movements restrictions
- Insects control

Dairy Herds & Feedlots

- All the above
- + Euthanasia of clinical cases

Lab Dx techniques

Kimron Vet. Institute (National) – Virology dept.

■ Routine

- PCR: blood , skin
- RT-PCR: blood, skin

■ Research

- PCR saliva, synovial fluid
- Isolation

Sheep-pox is a contagious disease caused by Capripox virus. It is characterized by skin and mucous membrane lesions, but the systemic reaction may lead to animal death. Vaccination is the only prevention method to control the high level of morbidity and mortality caused by this disease.

COMPOSITION:

Each dose of the vaccine contains:

Modified Sheep pox virus,
RM/65 strain at least... .. $10^{3.0}$ TCID₅₀*
(*Tissue culture infective dose 50%)

INDICATIONS

Prevention of sheep pox.

METHOD OF IMMUNIZATION

*Primer vaccination.

-One injection above the age of 3 months.

-If vaccination is performed on less than 3 months old lamb, a second injection must be given 6 months later.

*Yearly boosters.

If necessary sheep pox vaccine may be administered to pregnant ewes, which will transfer immunity for young lamb during the first 3 months of age.

METHOD OF USE AND DOSAGE

*Cold and sterile normal saline (diluent) is used to reconstitute the pelleted freeze-dried vaccine. The reconstituted vaccine must be protected from light and heat and be utilized immediately (limit time is 2 hours).

*Use 100 ml of diluent for vial of 100 doses, and 50 ml for 50 doses vial

* Inject 1 ml subcutaneously per animal into the sternum area, where there is no wool, behind the elbow.

*A small nodular reaction may appear at the point of inoculation (TAKES), which disappears later.

RECOMMENDATION

*Never use a syringe and a needle sterilized with a chemical agent.

*Use aseptic technique.

*Reconstitute the vaccine immediately before use and destroy any unused portion.

STORAGE

The vaccine can be stored at: + 2°C to + 8°C for two years.

PRESENTATION

Vials of 50 doses and 100 doses.

Sheep Pox
vaccine
RM/65

10^3 TCID
1 ml sc

Information - Communication

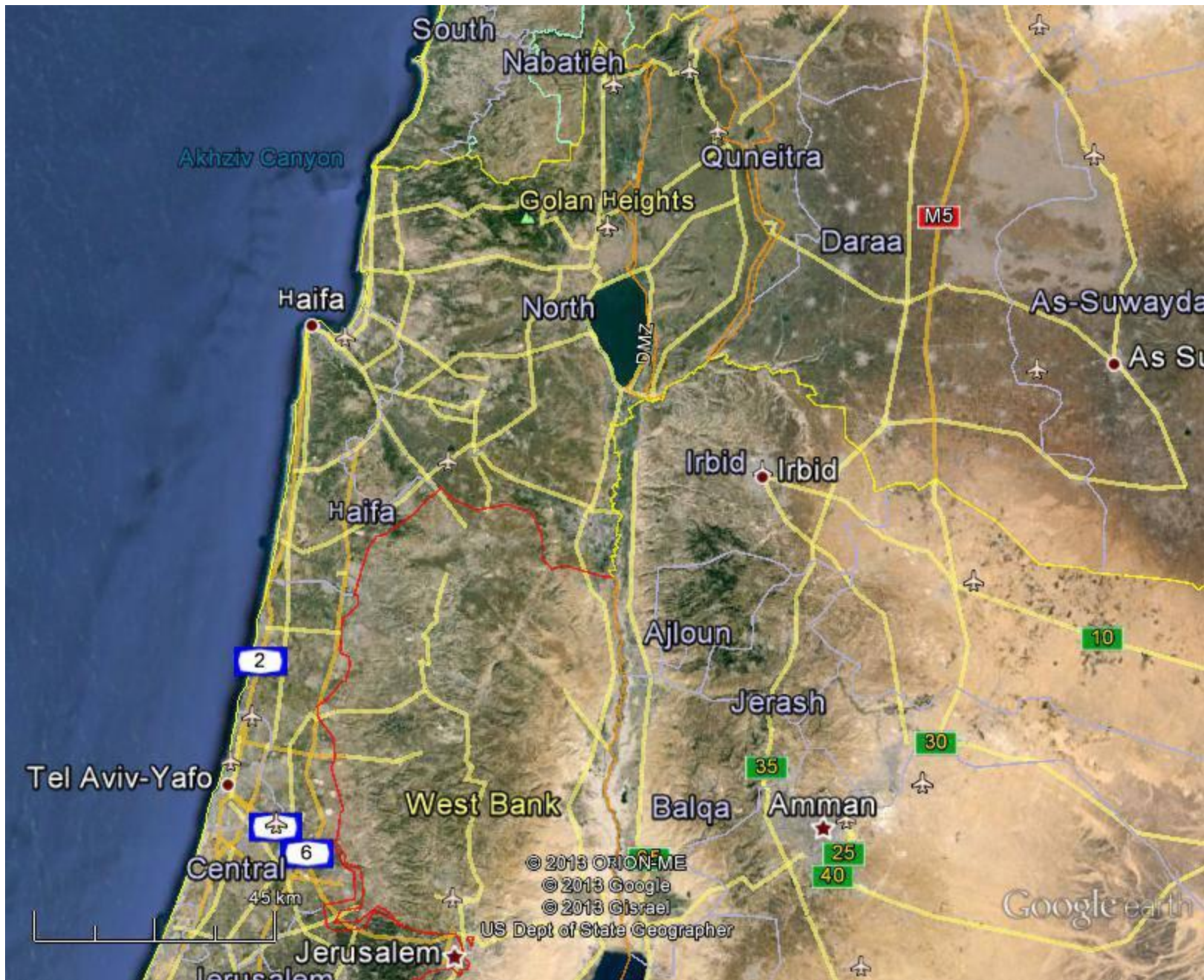
مرض الجلد العقدي (LSD Lumpy Skin Disease)

خلال الأشهر الأخيرة تم تشخيص مرض الجلد العقدي في ابقار في المنطقة.
مسبب المرض - فيروس الجلد العقدي، يقاوم الفيروس الحرارة والمؤثرات البيئية إلى حد ما ويمكنه البقاء حياً في القشور الجافة للأفات الجلدية وفي الجلود المملحة لفترة طويلة قد تصل إلى أشهر خاصة في نقص التعرض لأشعة الشمس.

طرق نقل العدوى - ينتقل المرض عن طريق لدغ الحشرات مثل الذباب والناموس.
أعراض المرض - هنالك عدة اعراض للمرض اهمها افراز اللعاب بشكل مفرط، وافرازات من العيون والأنف وارتفاع مفاجئ في درجة الحرارة 40-41م° وما يميز بشكل قاطع ظهور عقد جلدية على مساحات كبيرة بالجلد.

العلاج - المرض ليس له علاج نوعي خاص به العلاج الاعراضى و الداعم.
منع المرض - وسائل المنع الفعالة تطعيم، ورش مبيدات حشرية واستعمال طرق مختلفة للحد من تواجد الحشرات اللادغة. محبذ رش الحيوانات باحد المبيدات الحشرية المصادق استعمالها:
الحد من حركة الحيوانات.
اليقظة والاعلام الفوري مهم جداً. عند اي حالة شك في التعرف للمرض يجب على الفور اعلام الدائرة البيطرية.





Beef

Milk



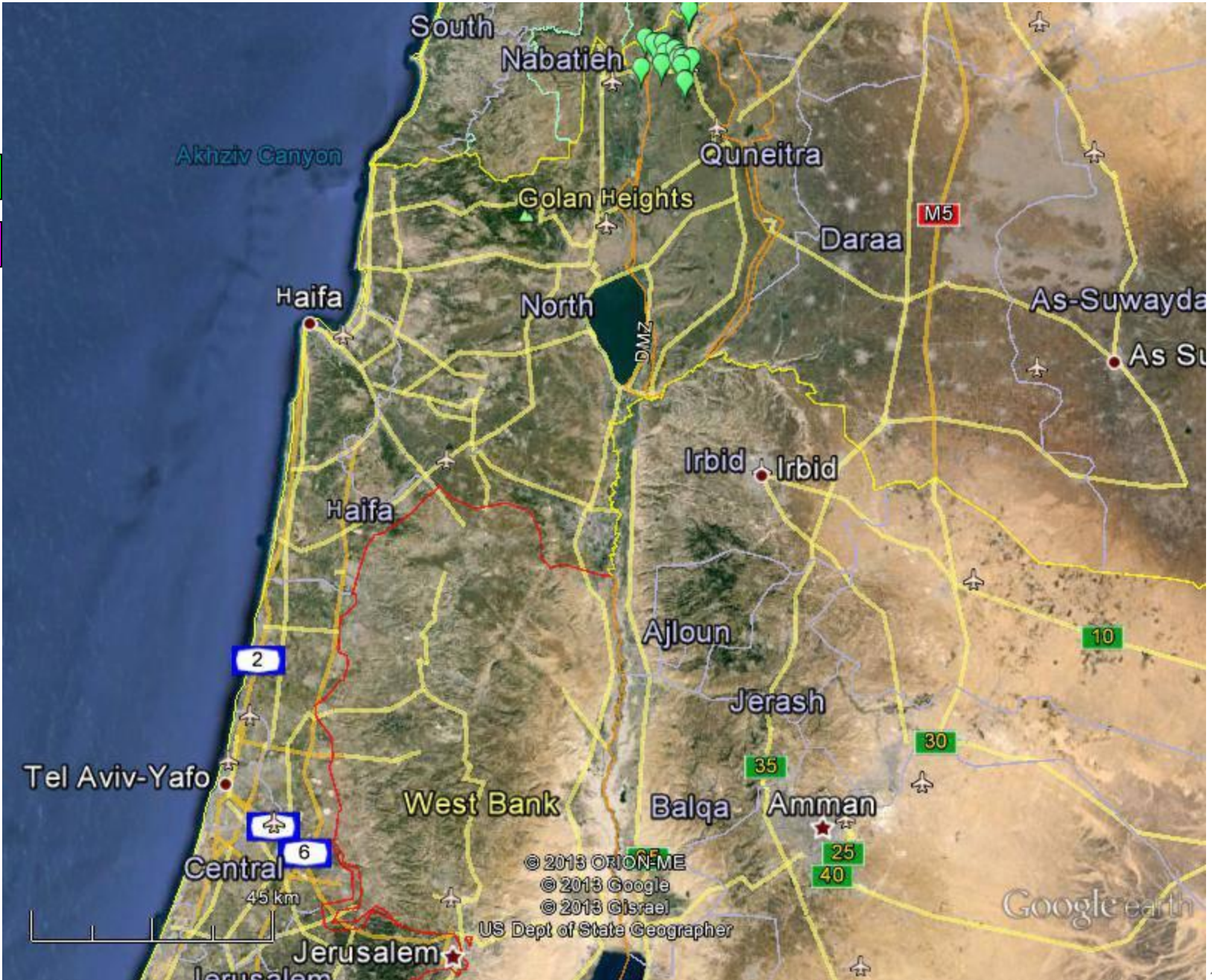
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Google earth



Beef

Milk



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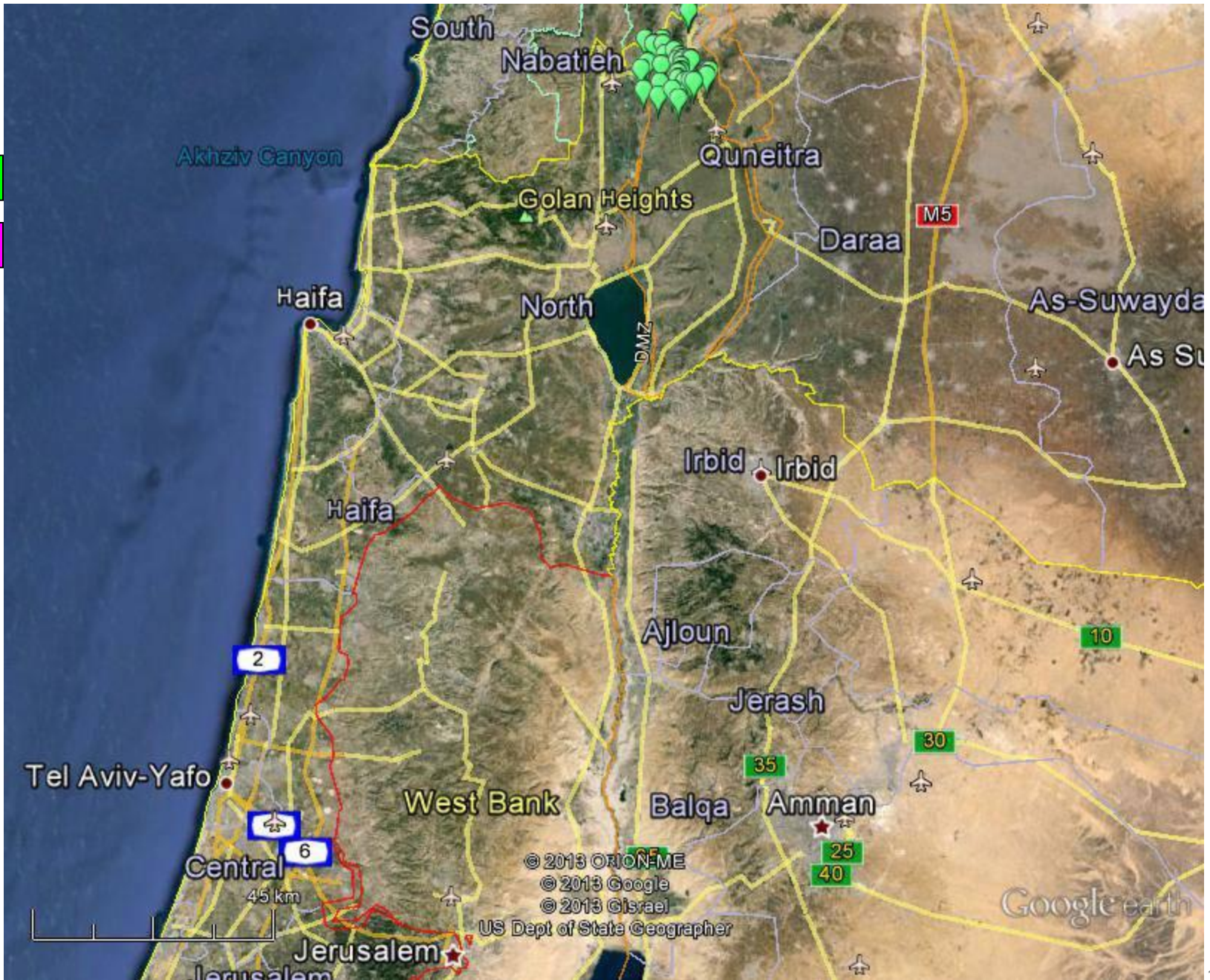


Beef

Milk

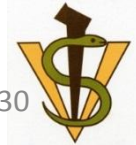


Beef
Milk



Beef

Milk



Beef

Milk



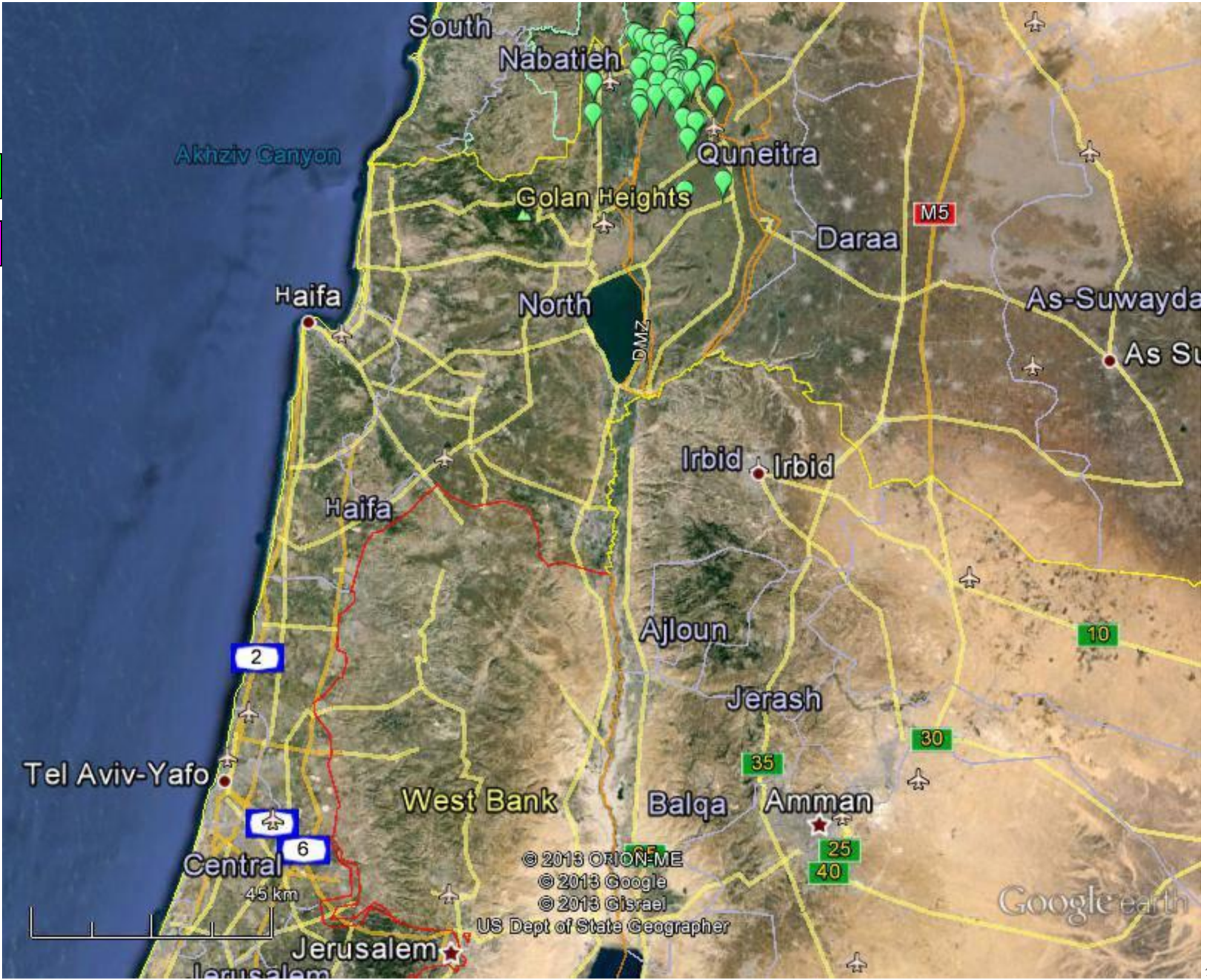
Beef

Milk



Beef

Milk



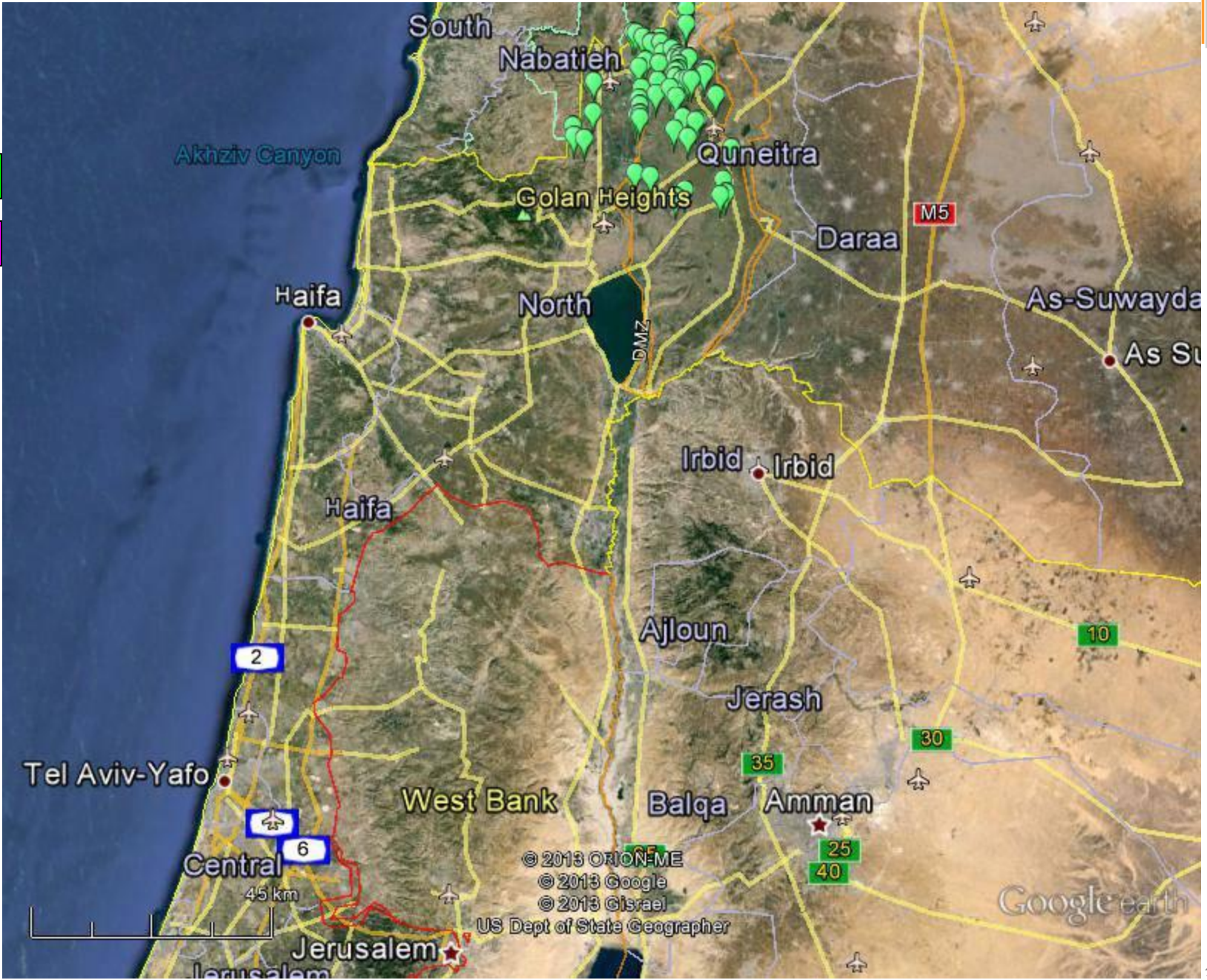
Beef

Milk



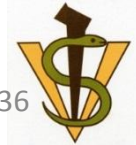
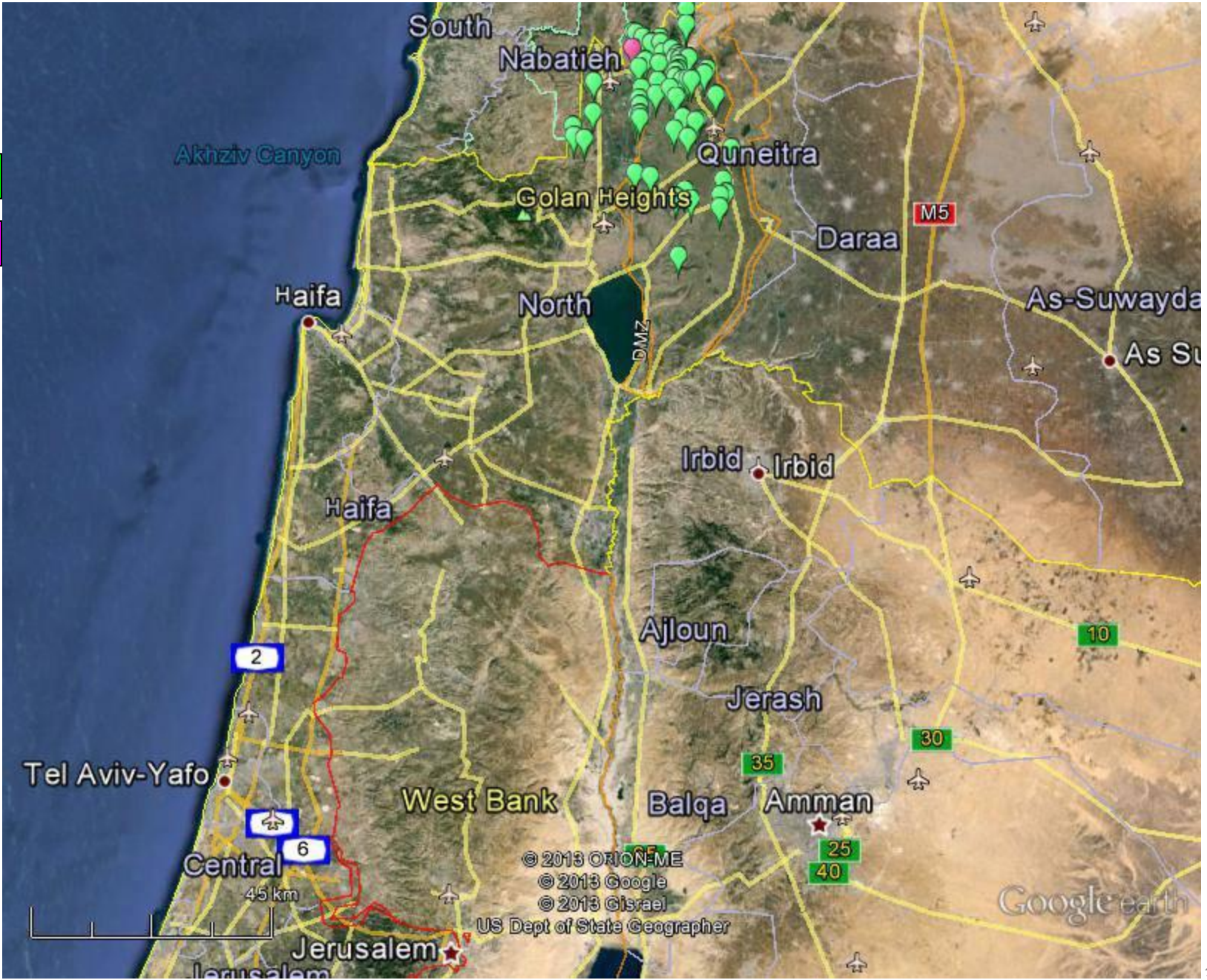
Beef

Milk



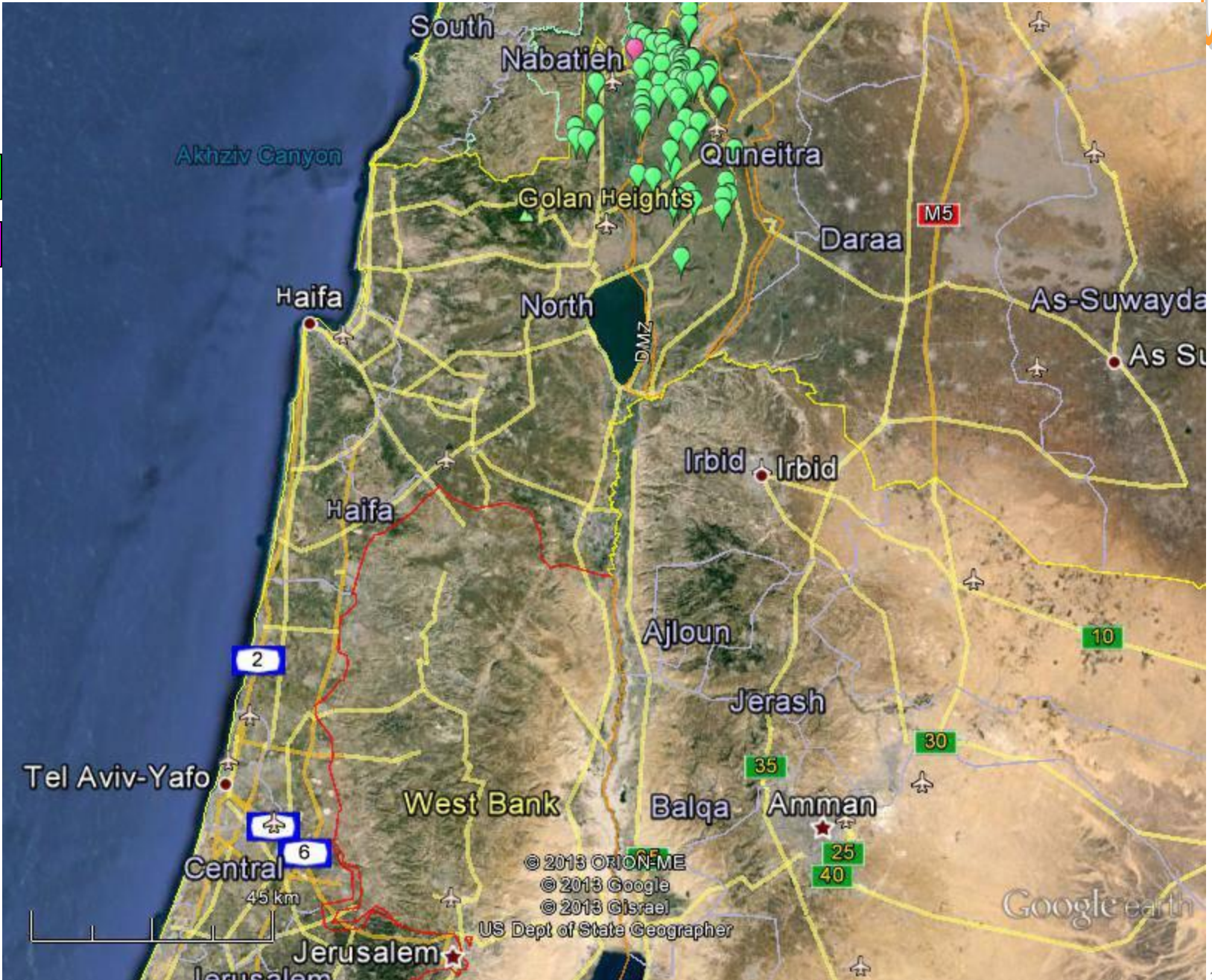
Beef

Milk



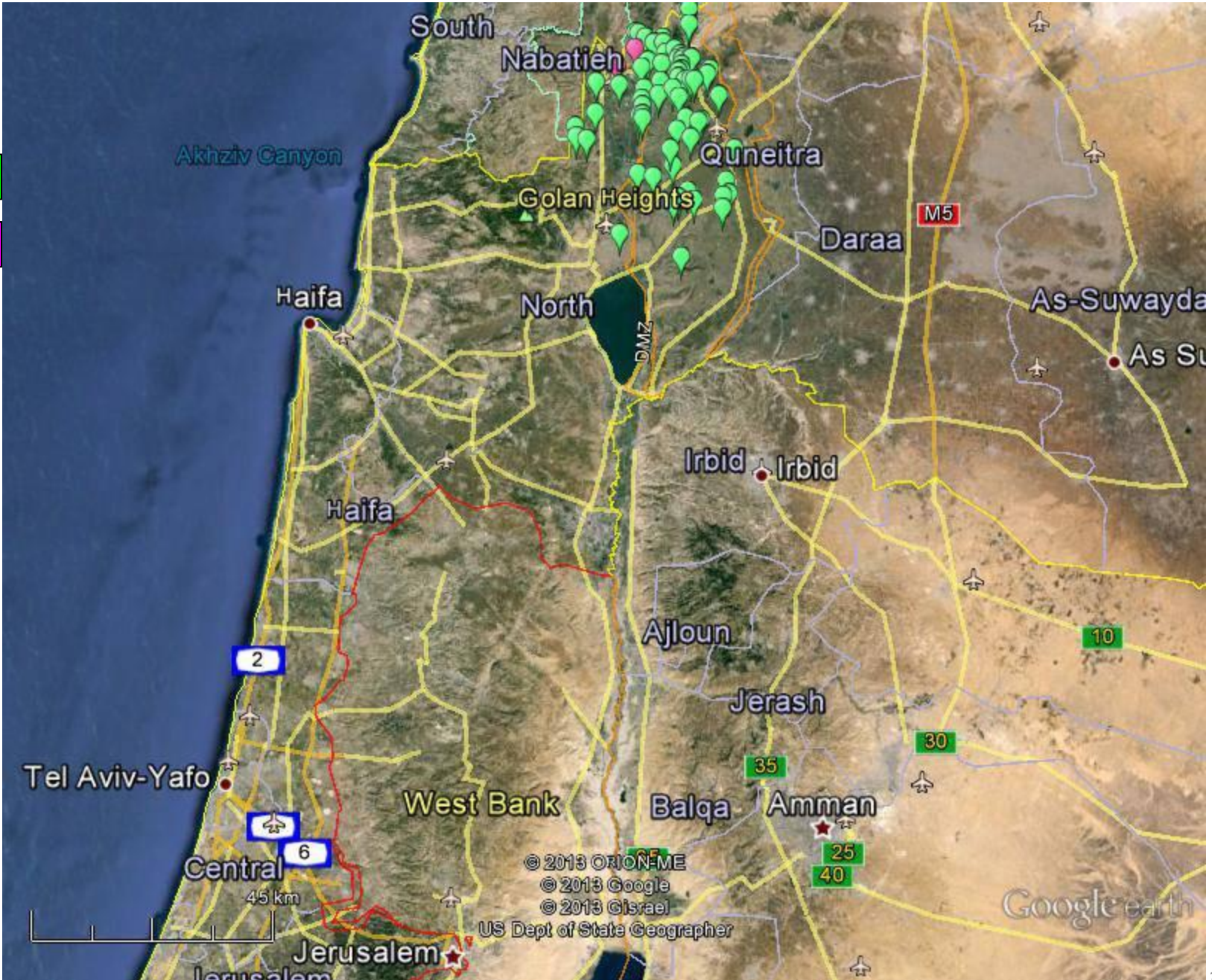
Beef

Milk



Beef

Milk



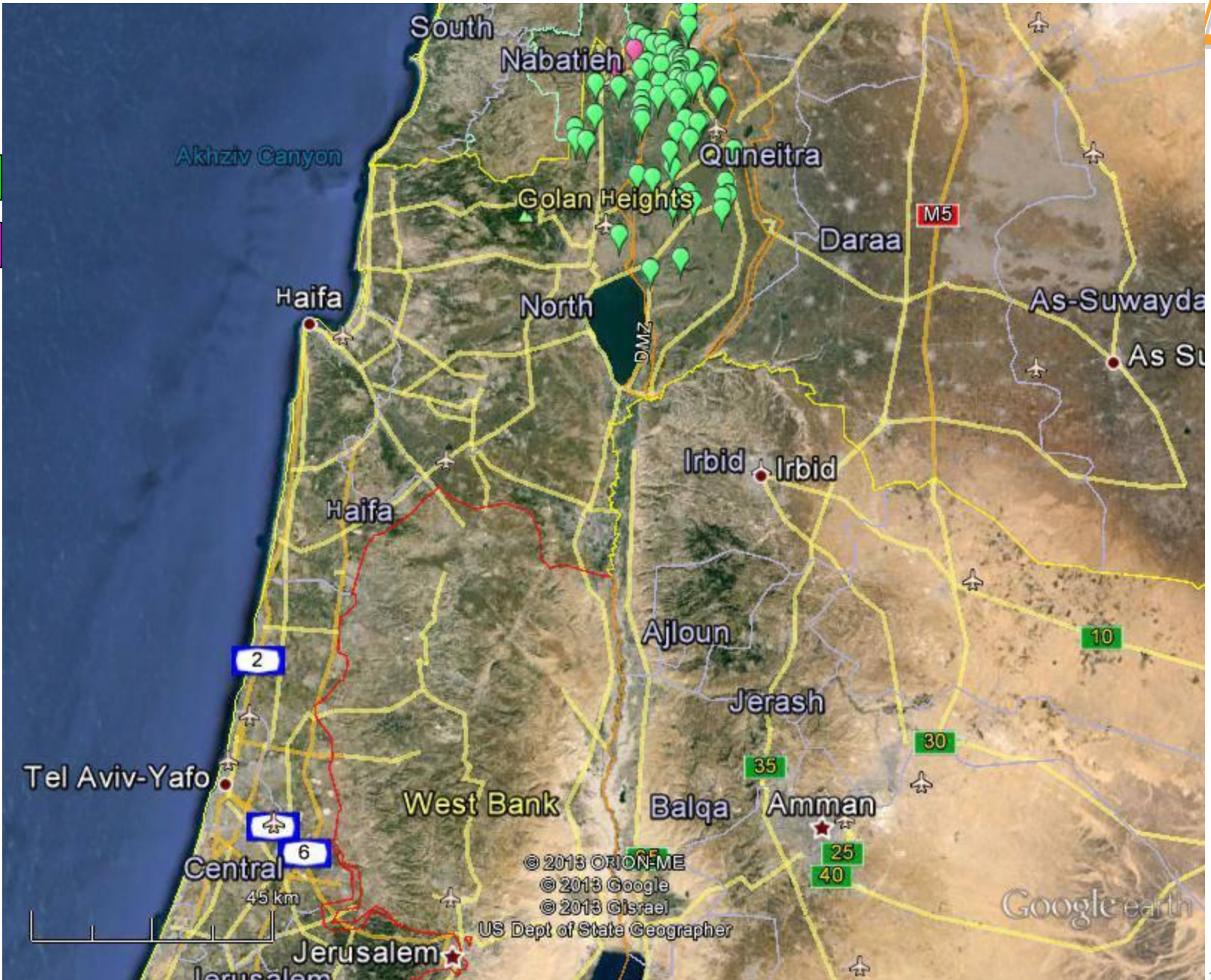
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 US Dept of State Geographer

Google earth



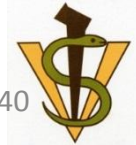
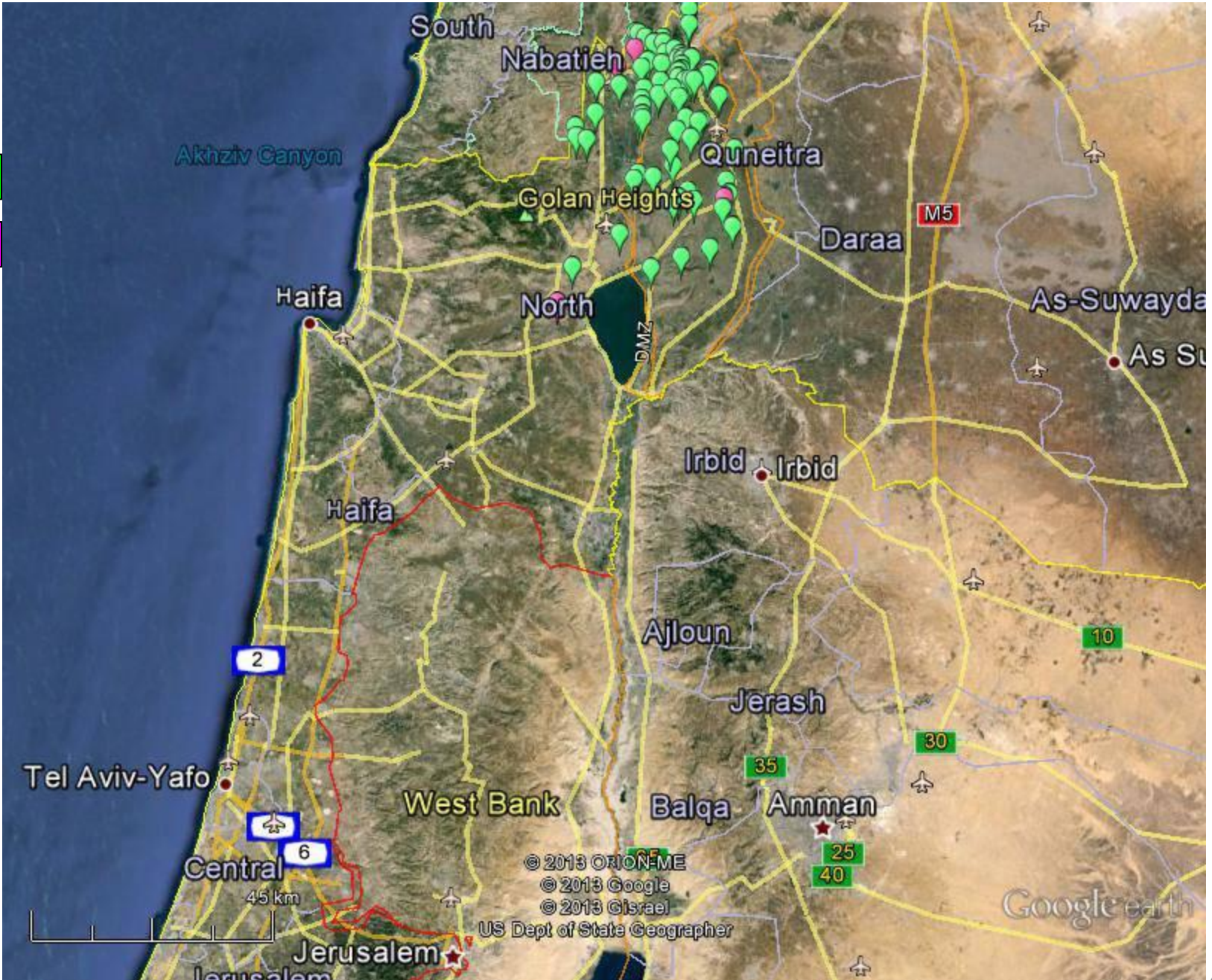
Beef

Milk



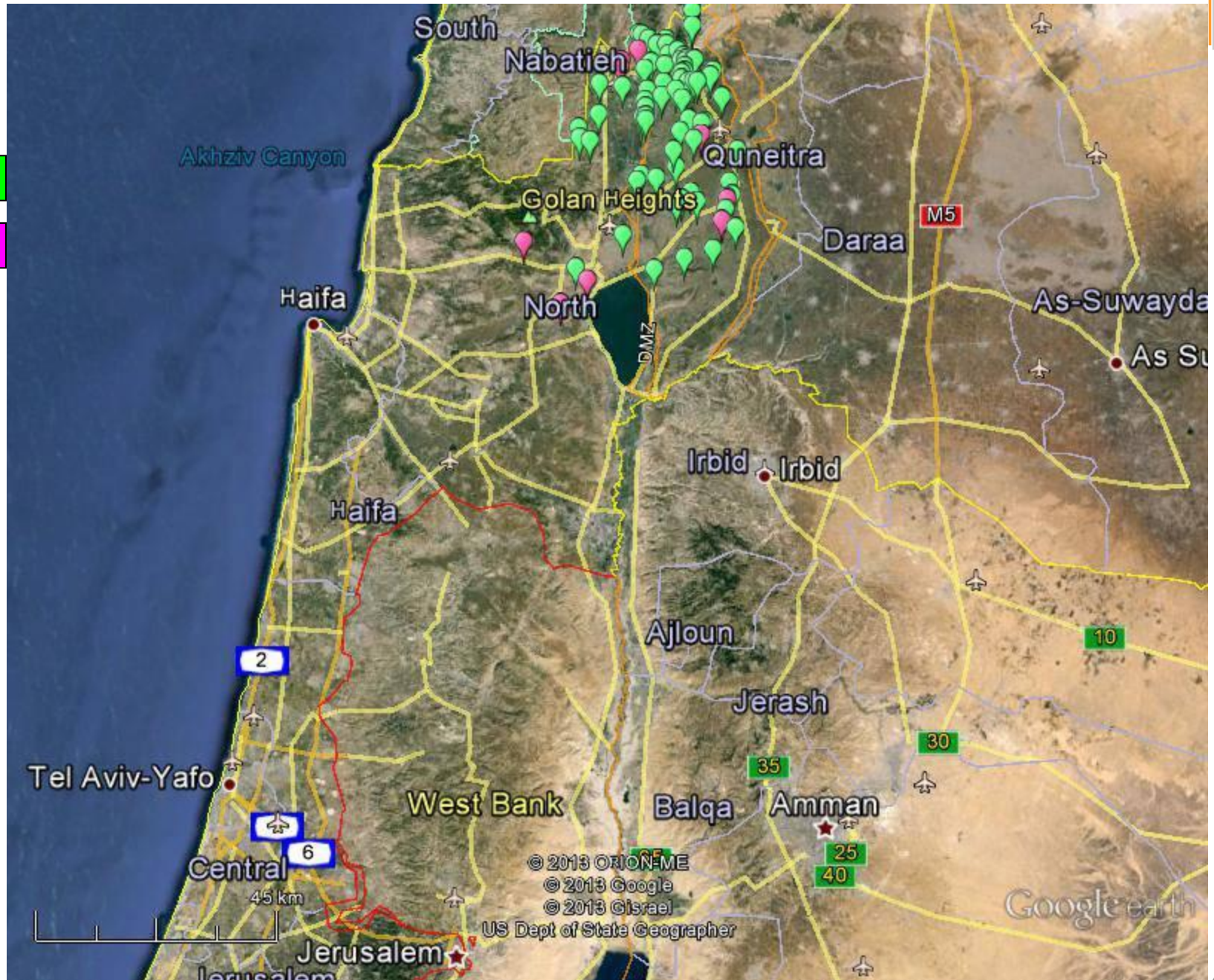
Beef

Milk



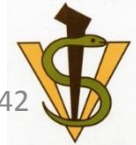
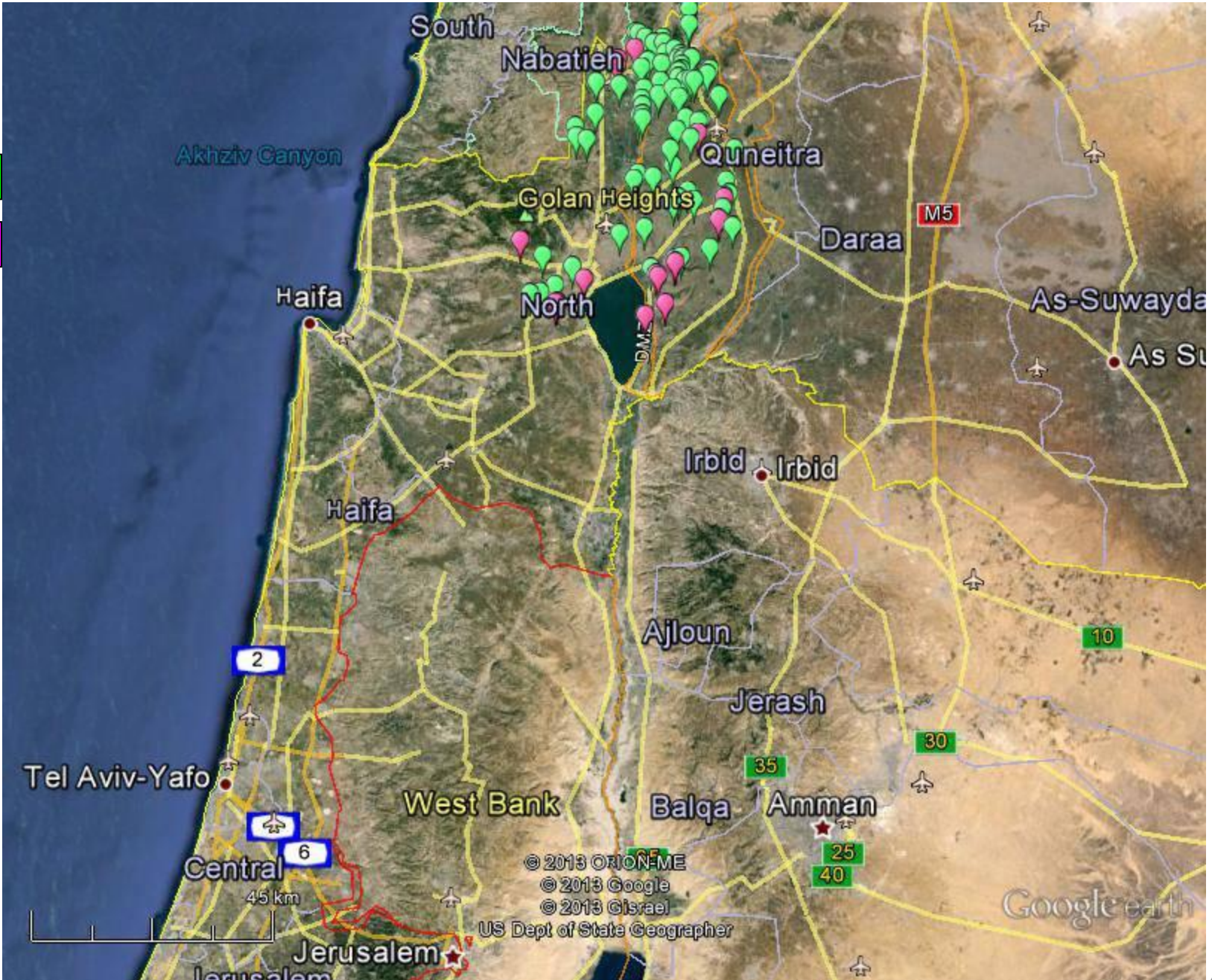
Beef

Milk



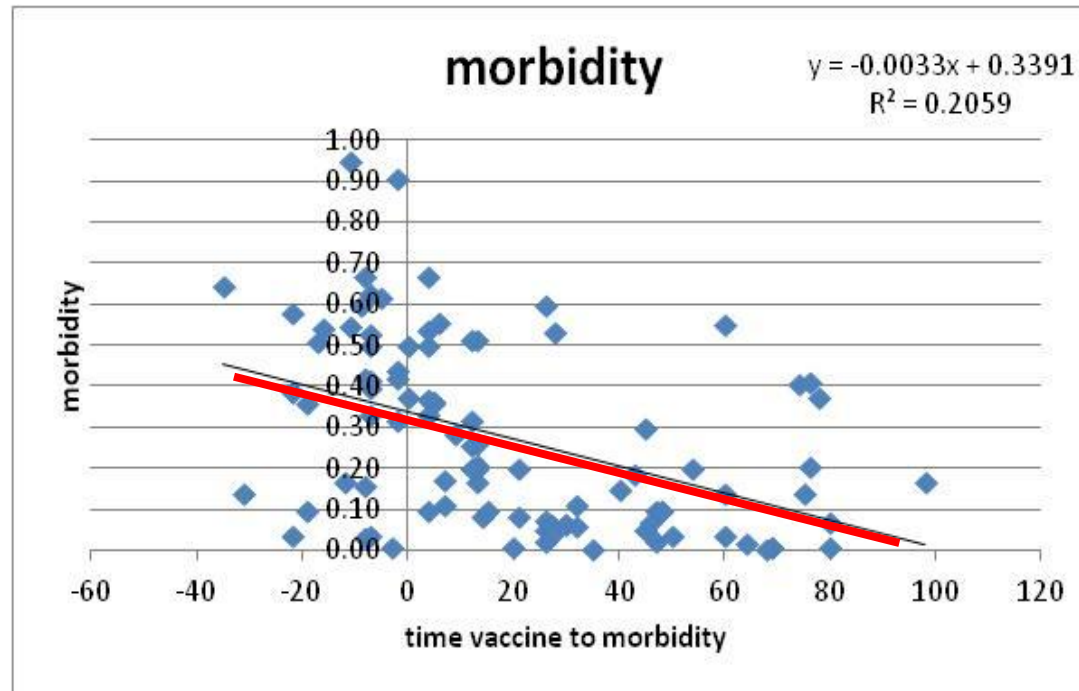
Beef

Milk



Morbidity vs time from vaccination

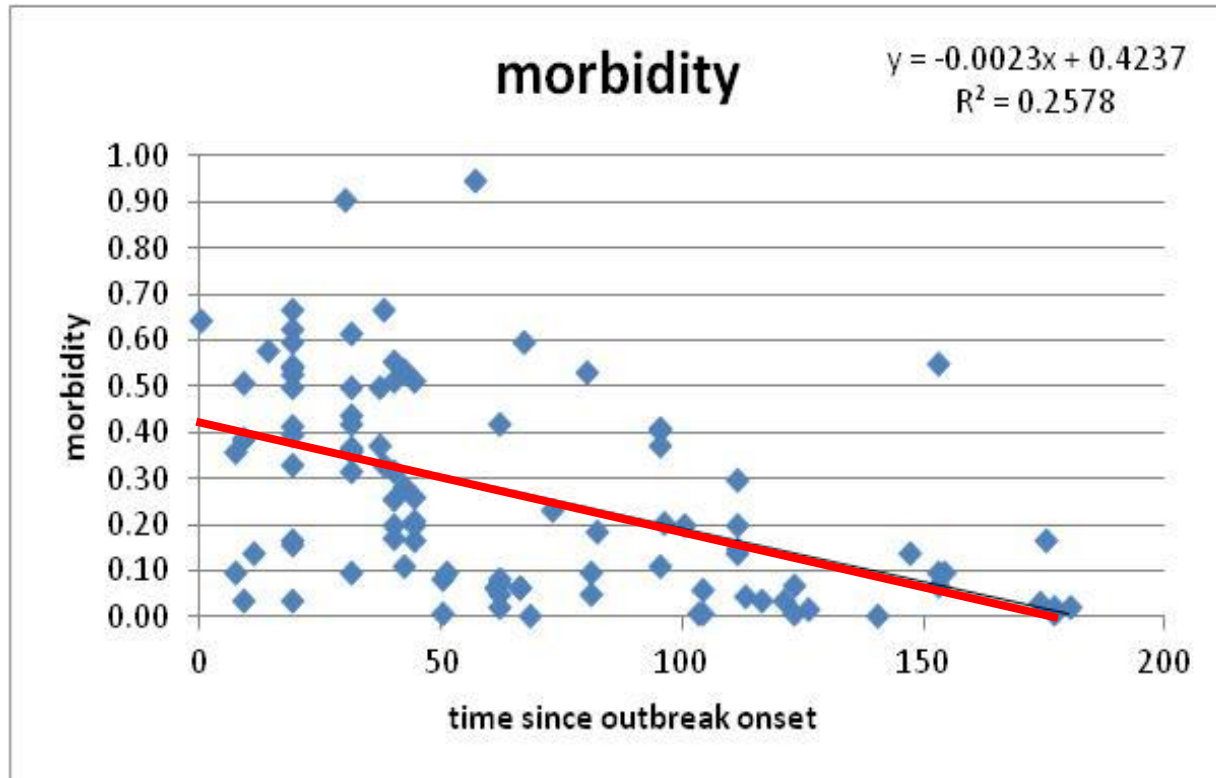
Beef herds - preliminary findings



Prof. E. Klement Koret Vet School



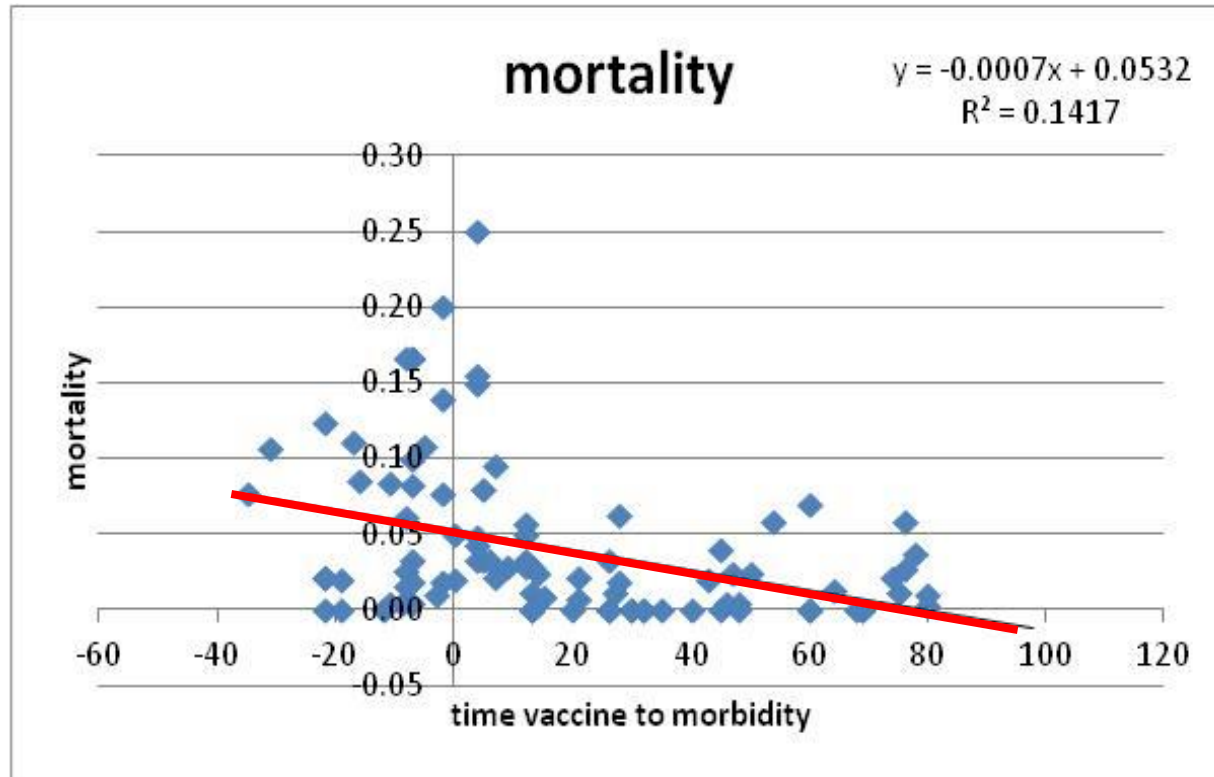
Morbidity vs time from onset first outbreak 28-07-2012



Prof. E. Klement Koret Vet School



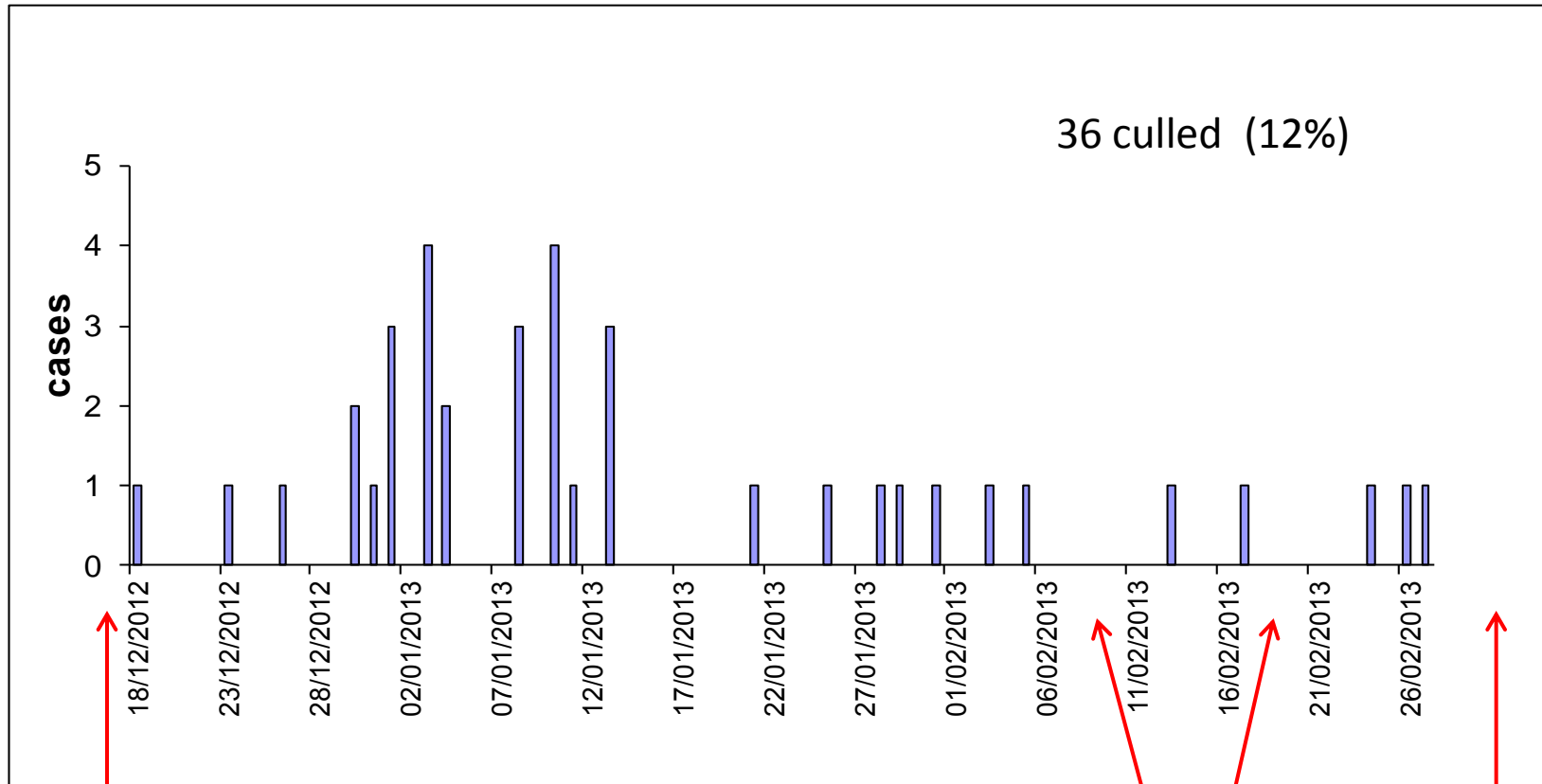
Mortality vs time from vaccination



Prof. E. Klement Koret Vet School

Kibbutz Genosar – dairy farm

Rift valley, mild winter, 300 milking cows



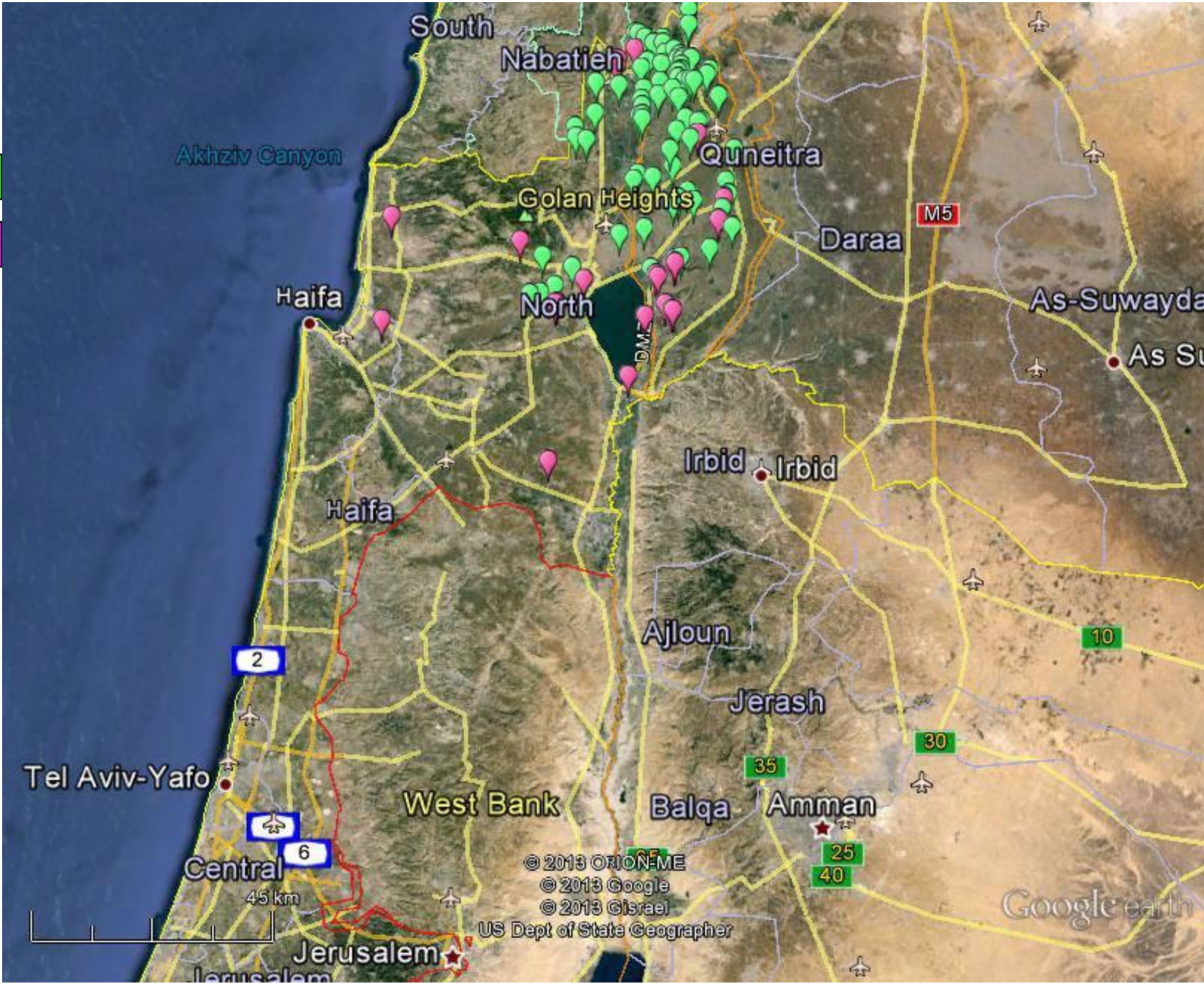
Pox 1
04/12/12

Pox 10
08-18/02/13

Neethling
18/03/13 ~

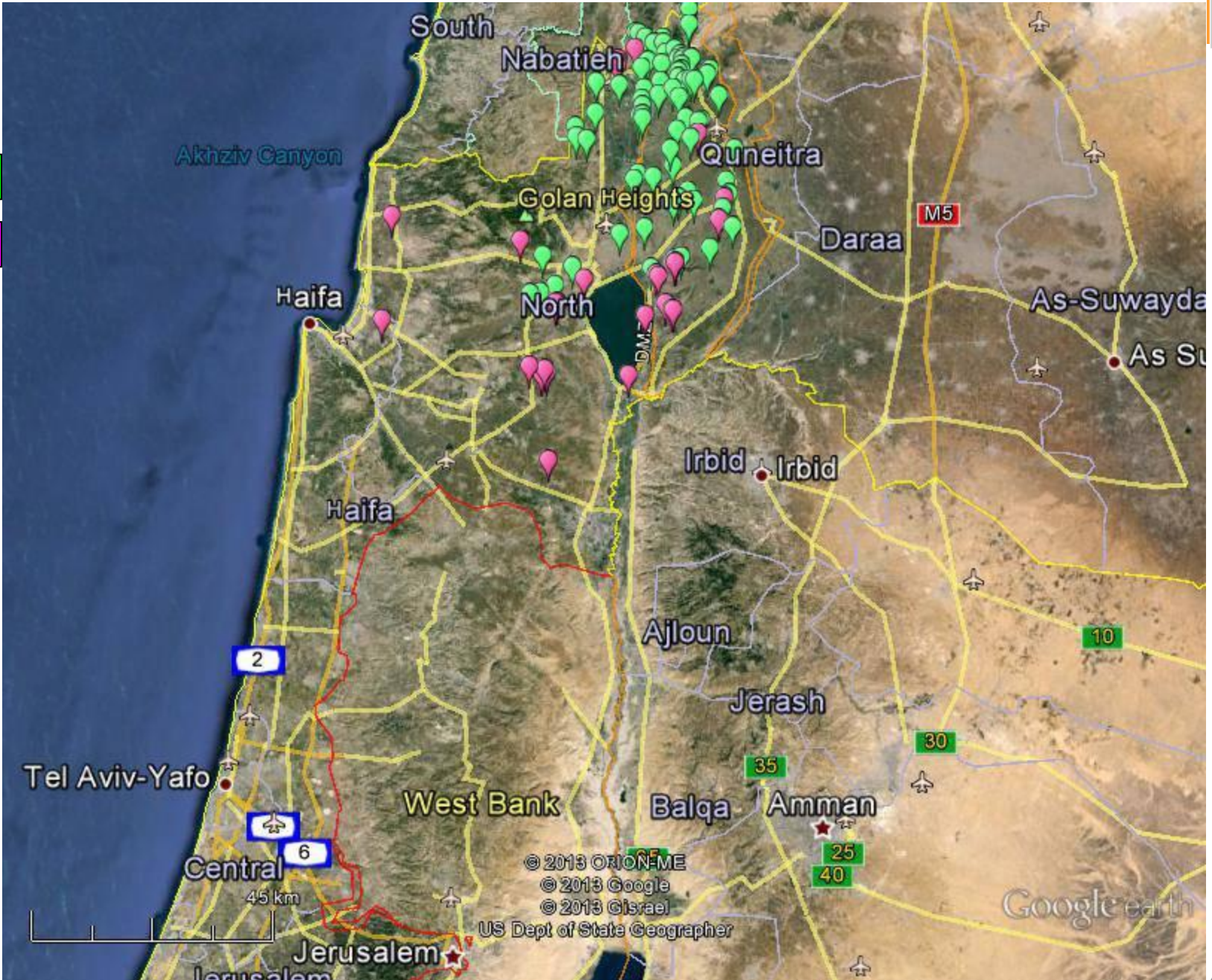
Beef

Milk



Beef

Milk



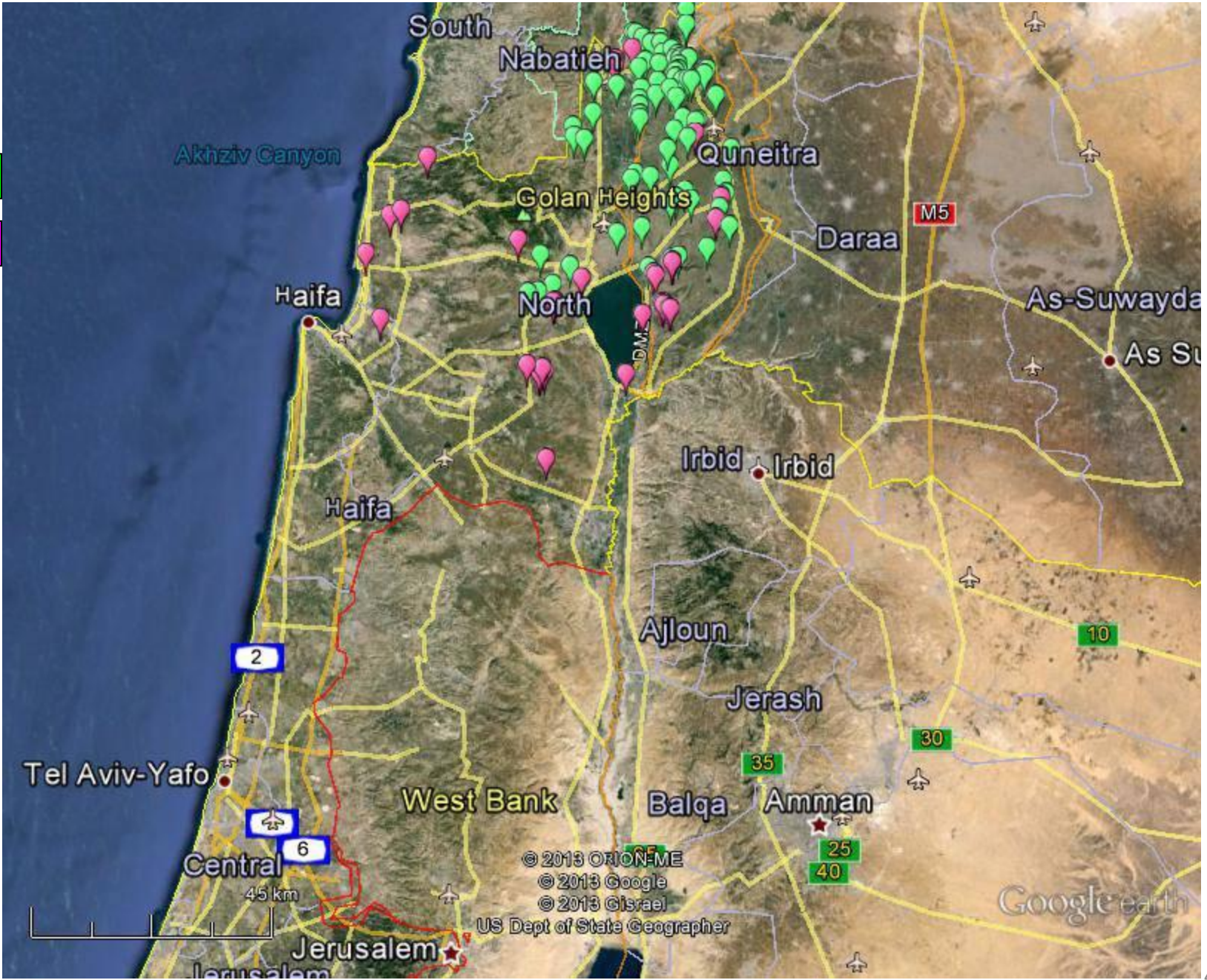
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Google earth



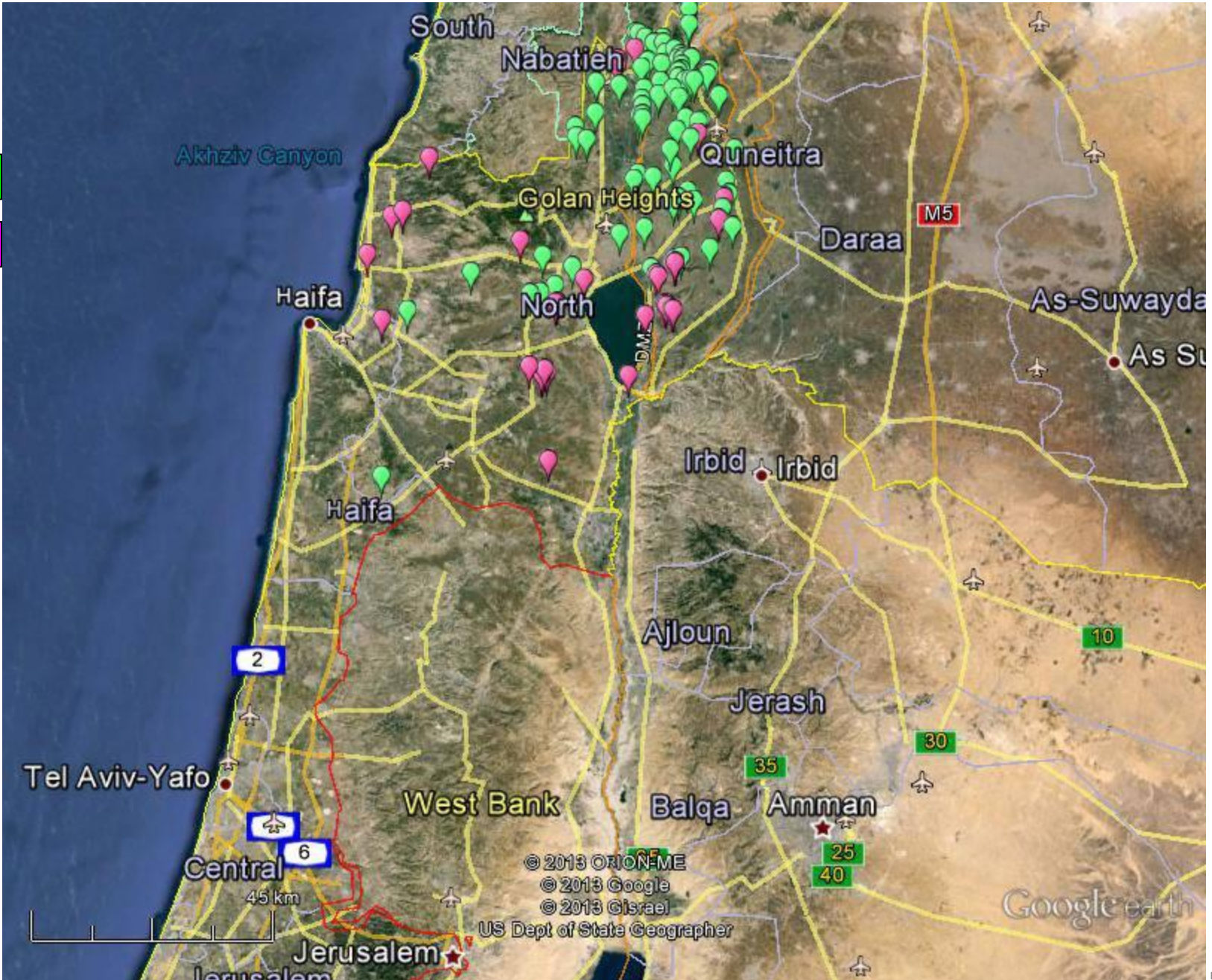
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Milk



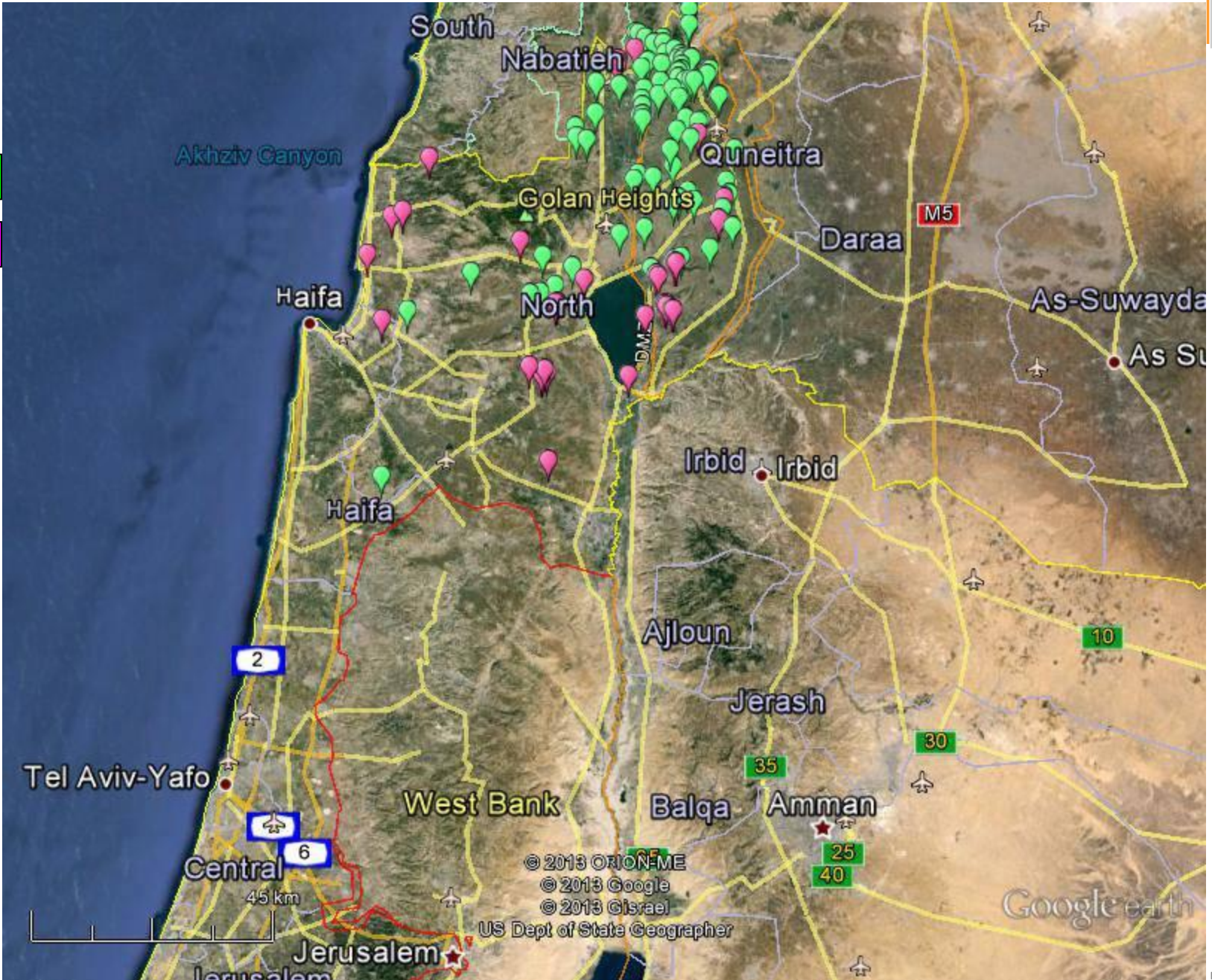
Beef

Milk



Beef

Milk



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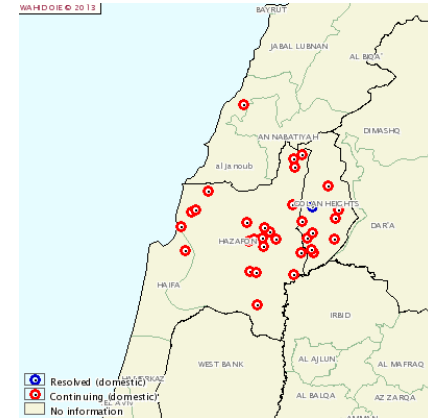
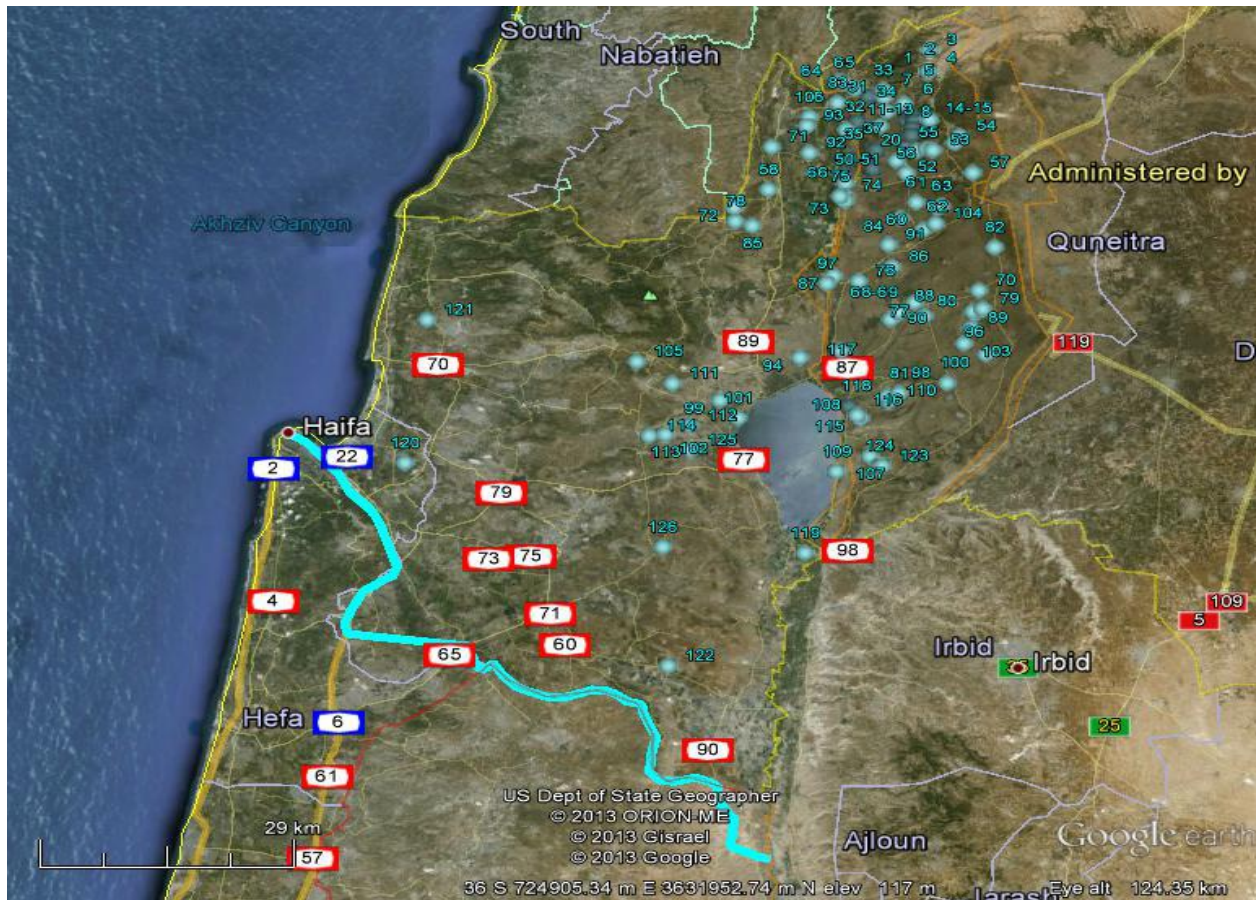
Google earth



Outbreaks & Vaccinated Zone

February 2013

Vaccine change



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COMPOSITION:

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(*Tissue culture infective dose 50%)

INDICATIONS

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RECOMMENDATION

*Never use a syringe and a needle sterilized with a chemical agent.

*Use aseptic technique.

*Reconstitute the vaccine immediately before use and destroy any unused portion.

STORAGE

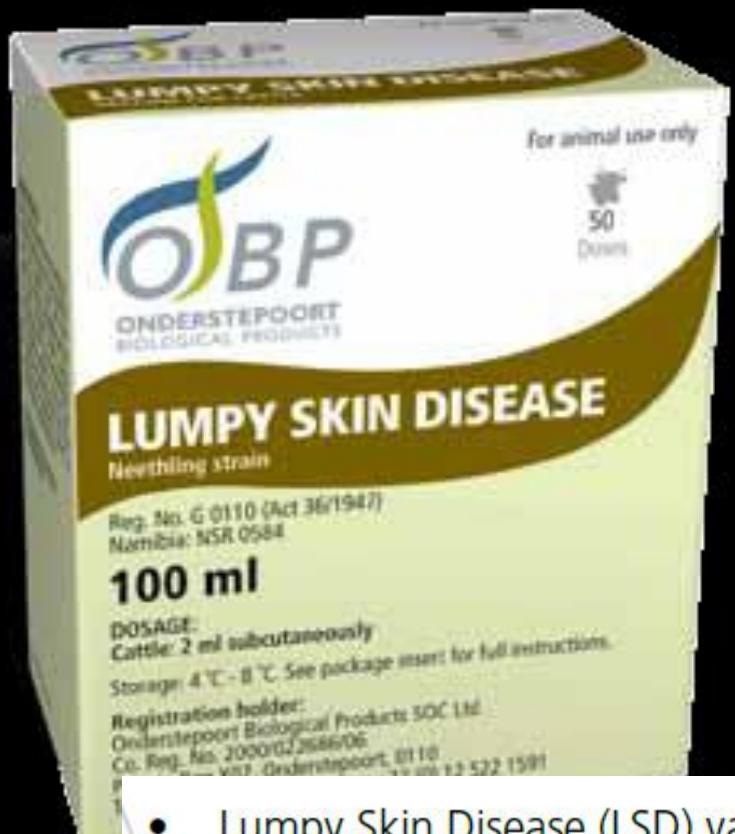
The vaccine can be stored at: + 2°C to + 8°C for two years.

PRESENTATION

Vials of 50 doses and 100 doses.

Sheep Pox RM/65

“POX 10” =
 10^4
2ml dose



Neethling Vaccine

- Lumpy Skin Disease (LSD) vaccine contains the proven **Neethling strain**
- Protect bulls against virus excretion in the semen
- Ensures sufficient protection against field strains of Lumpy Skin viruses
- Stimulate immunity in 7 - 14 days
- The vaccine is safe to use in PREGNANT animals

Recommendations

Calves: From 4 - 6 weeks of age

Adults: Yearly vaccinations ensure good



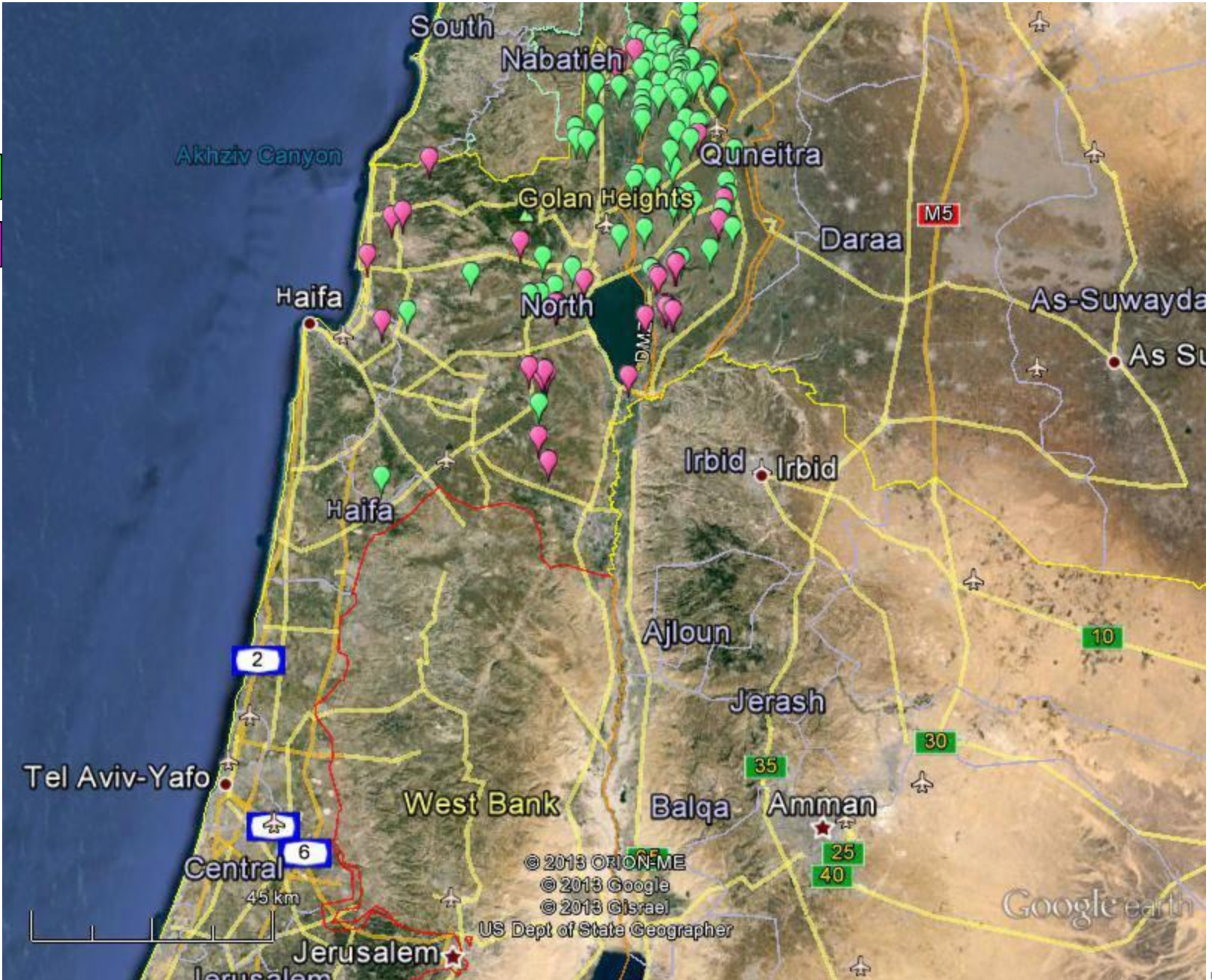
Neethling post vaccination response



KVI developed
PCR differentiating
wild virus from vaccine strain

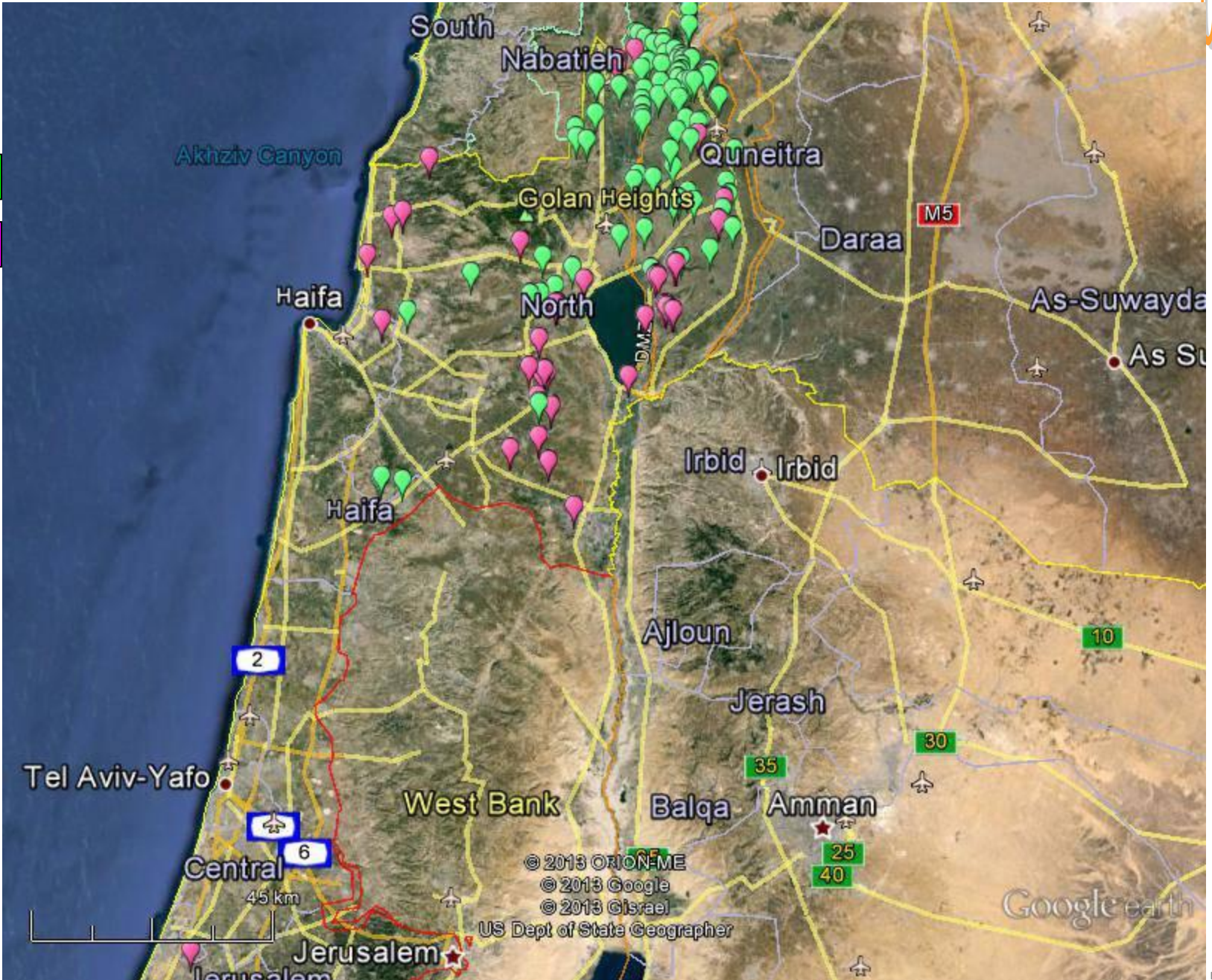
Beef

Milk



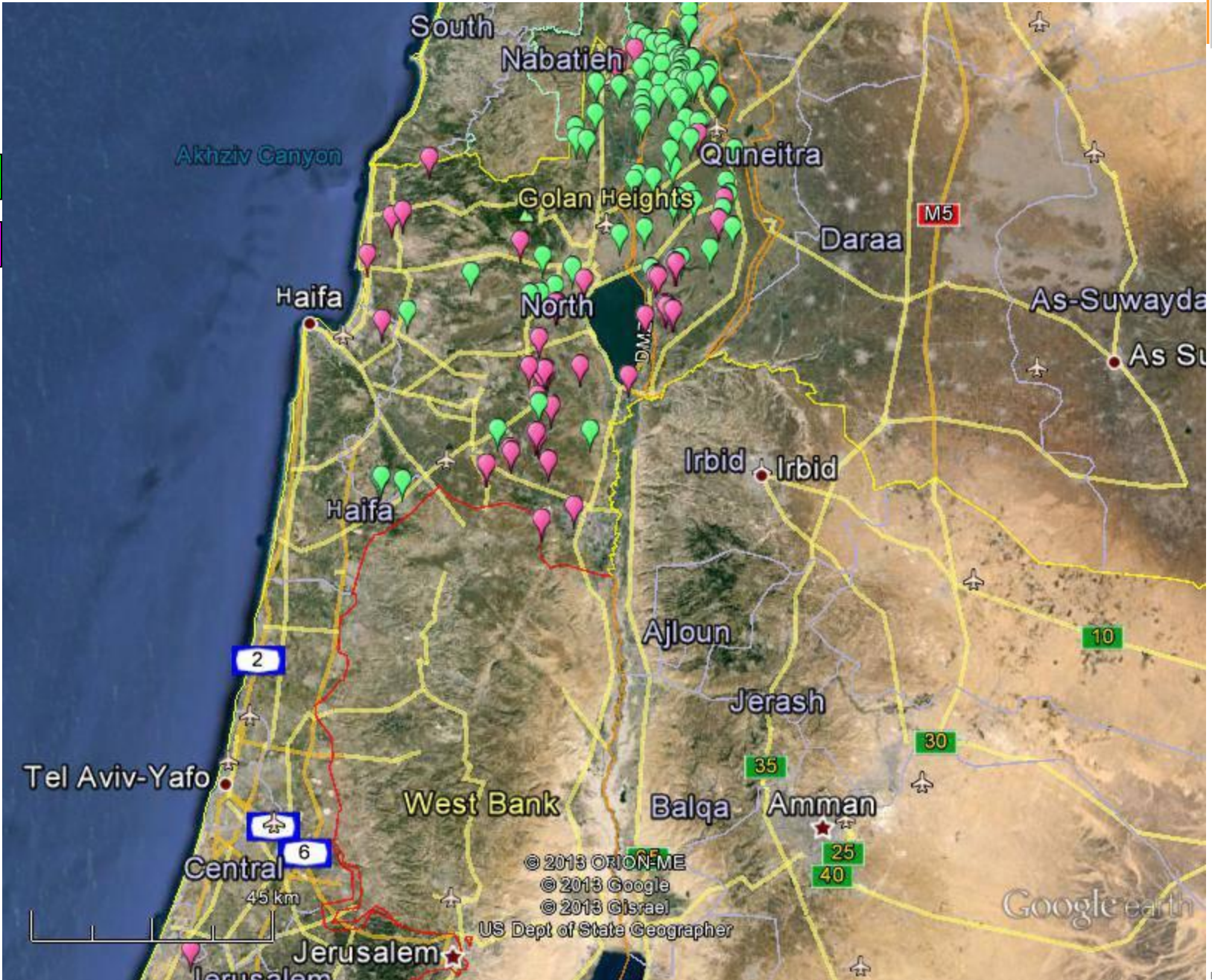
Beef

Milk



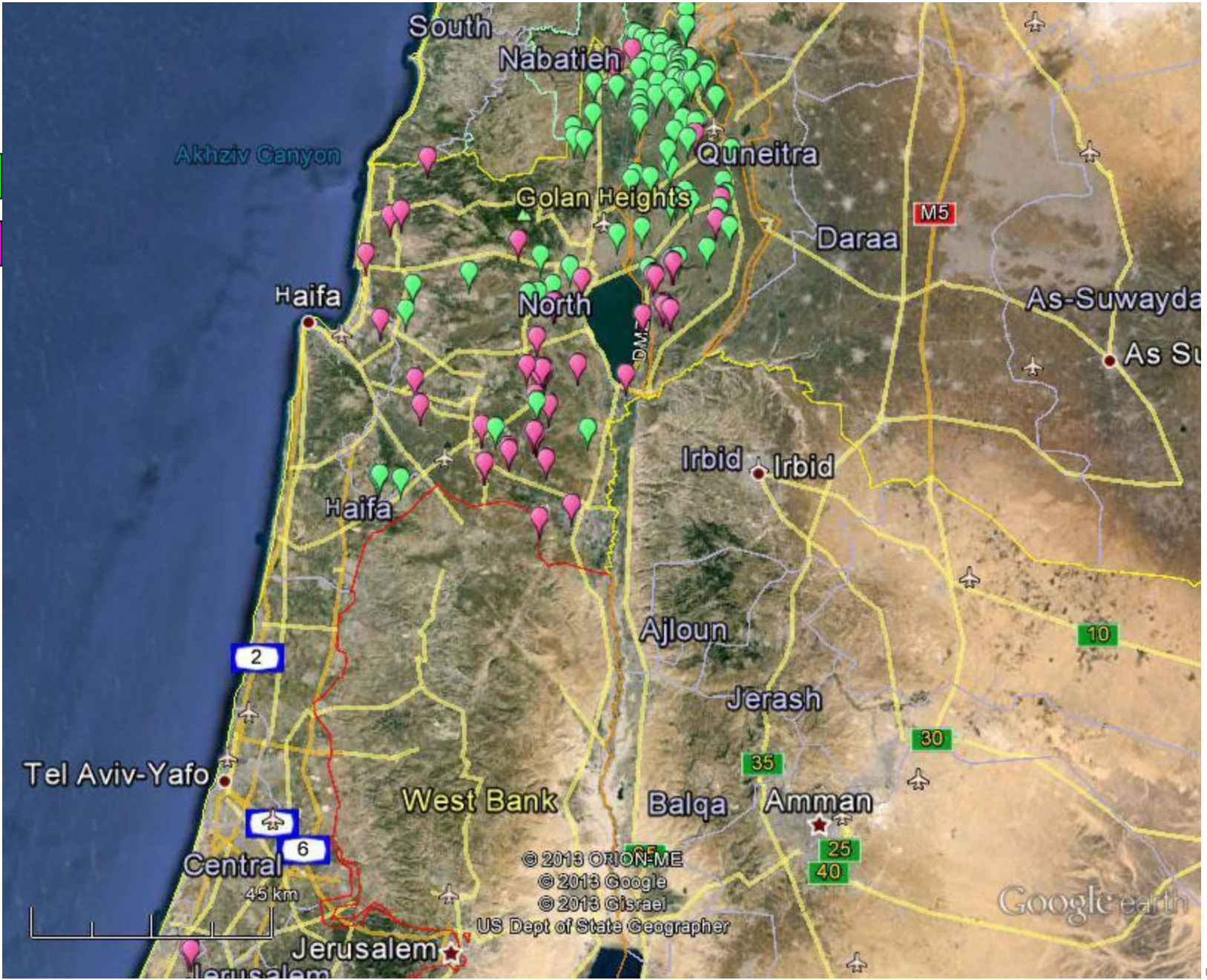
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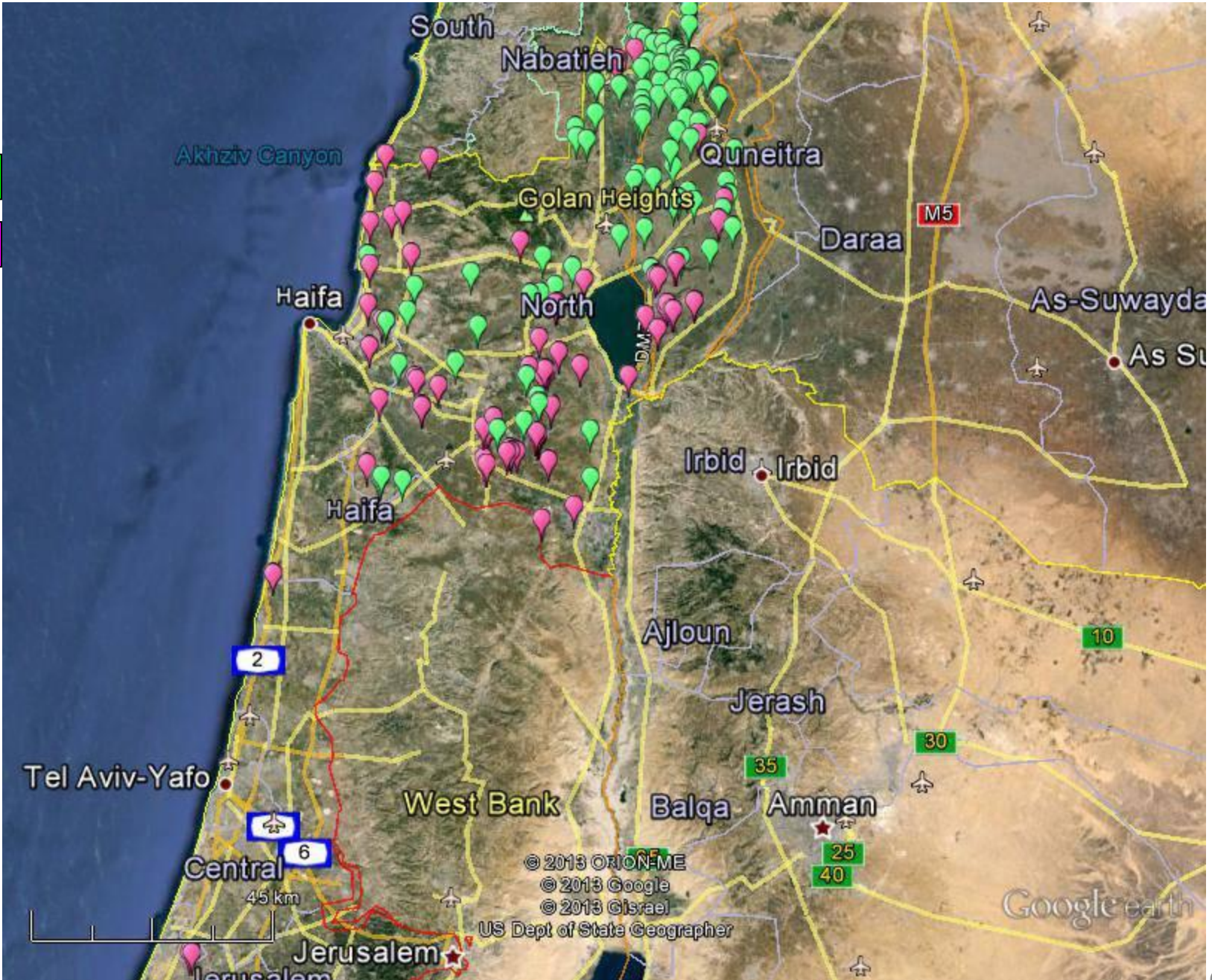
Beef

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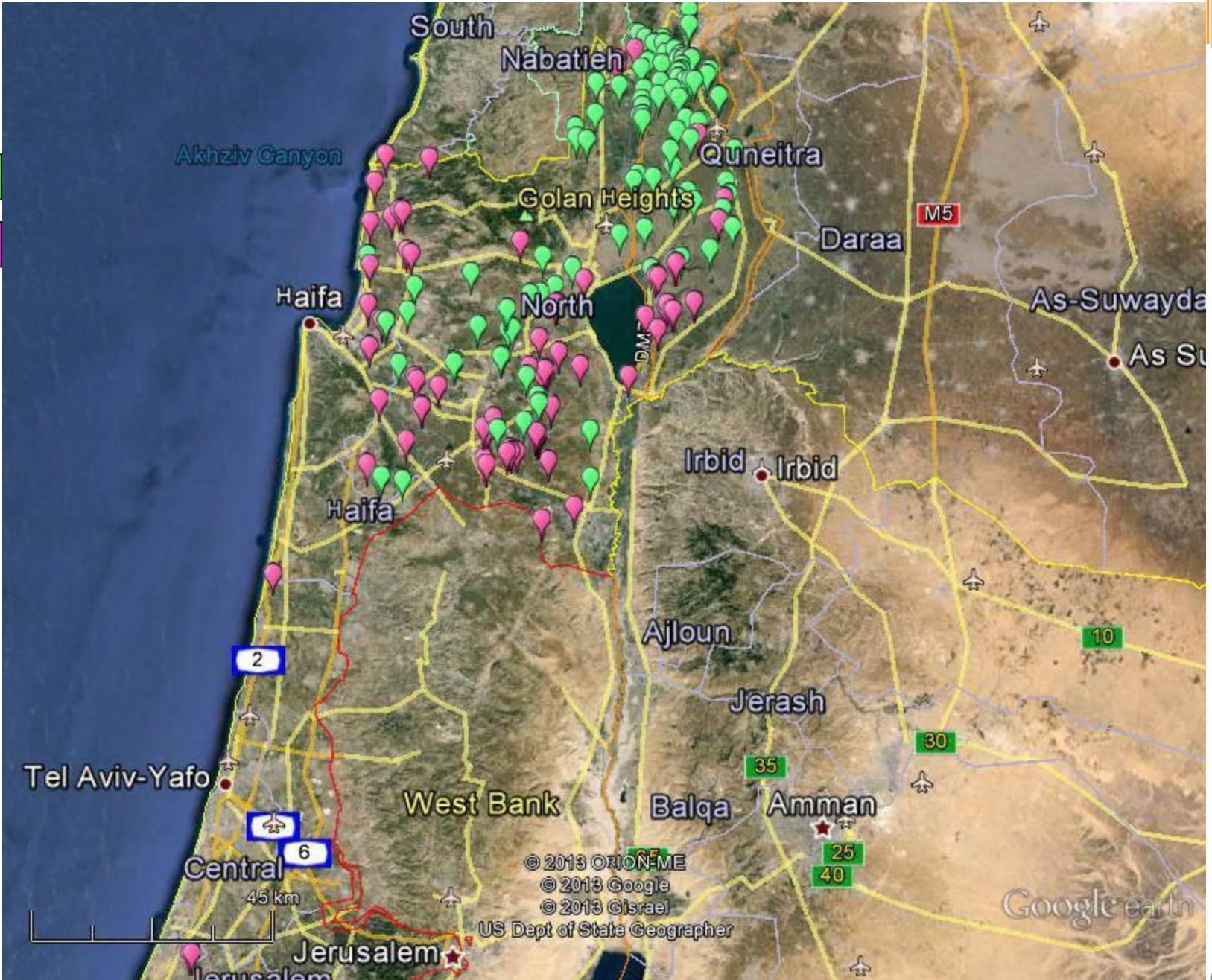
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Milk



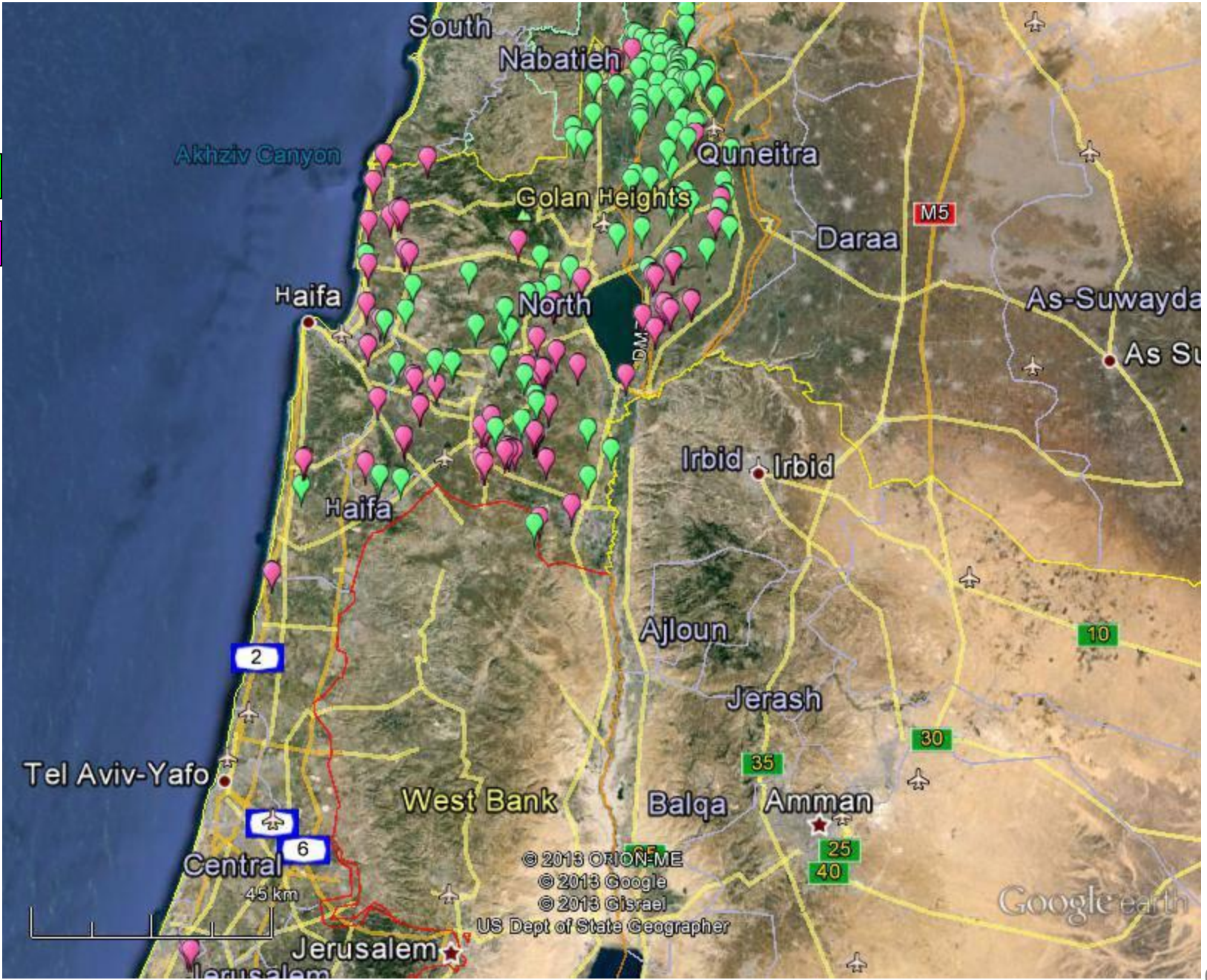
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Milk



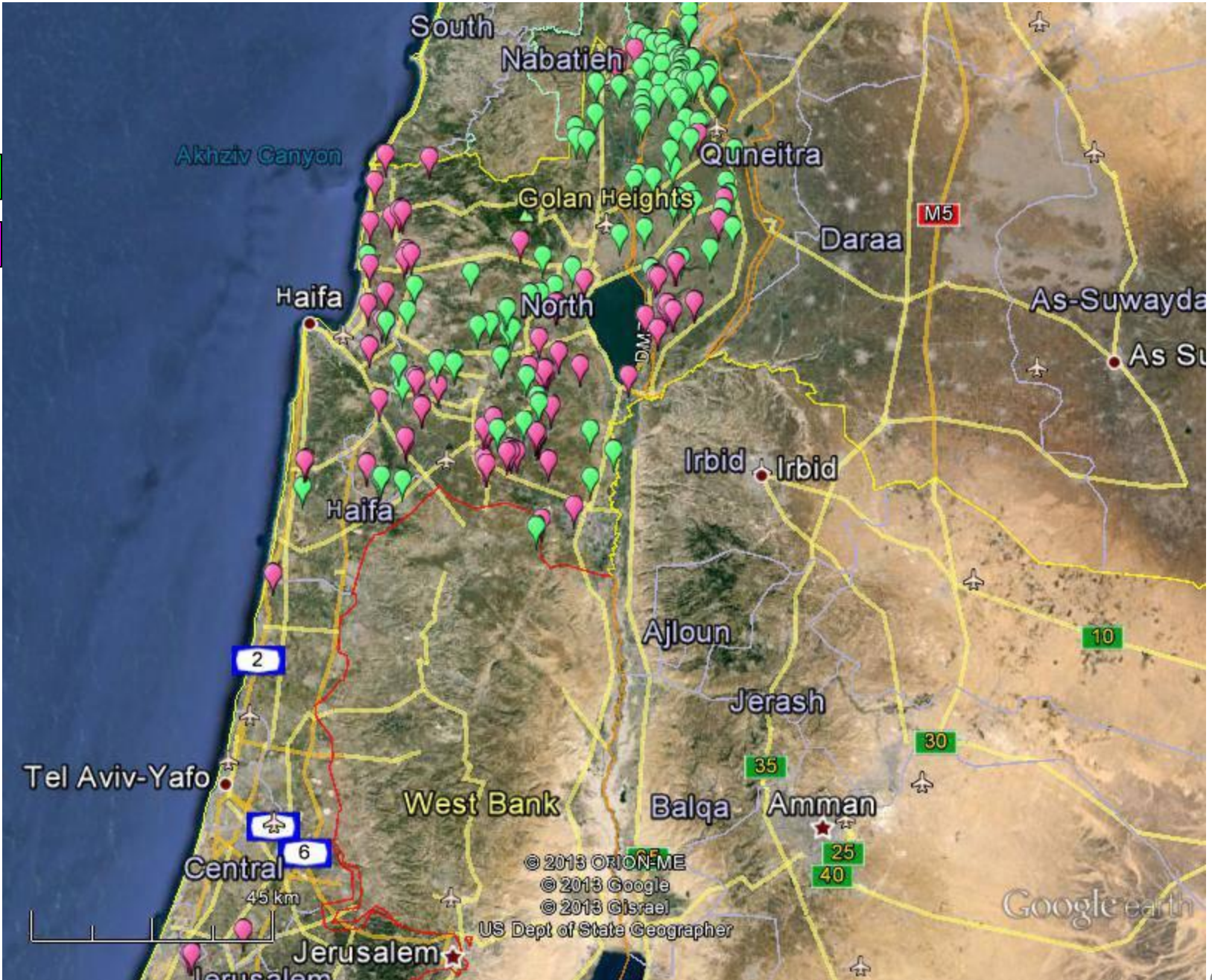
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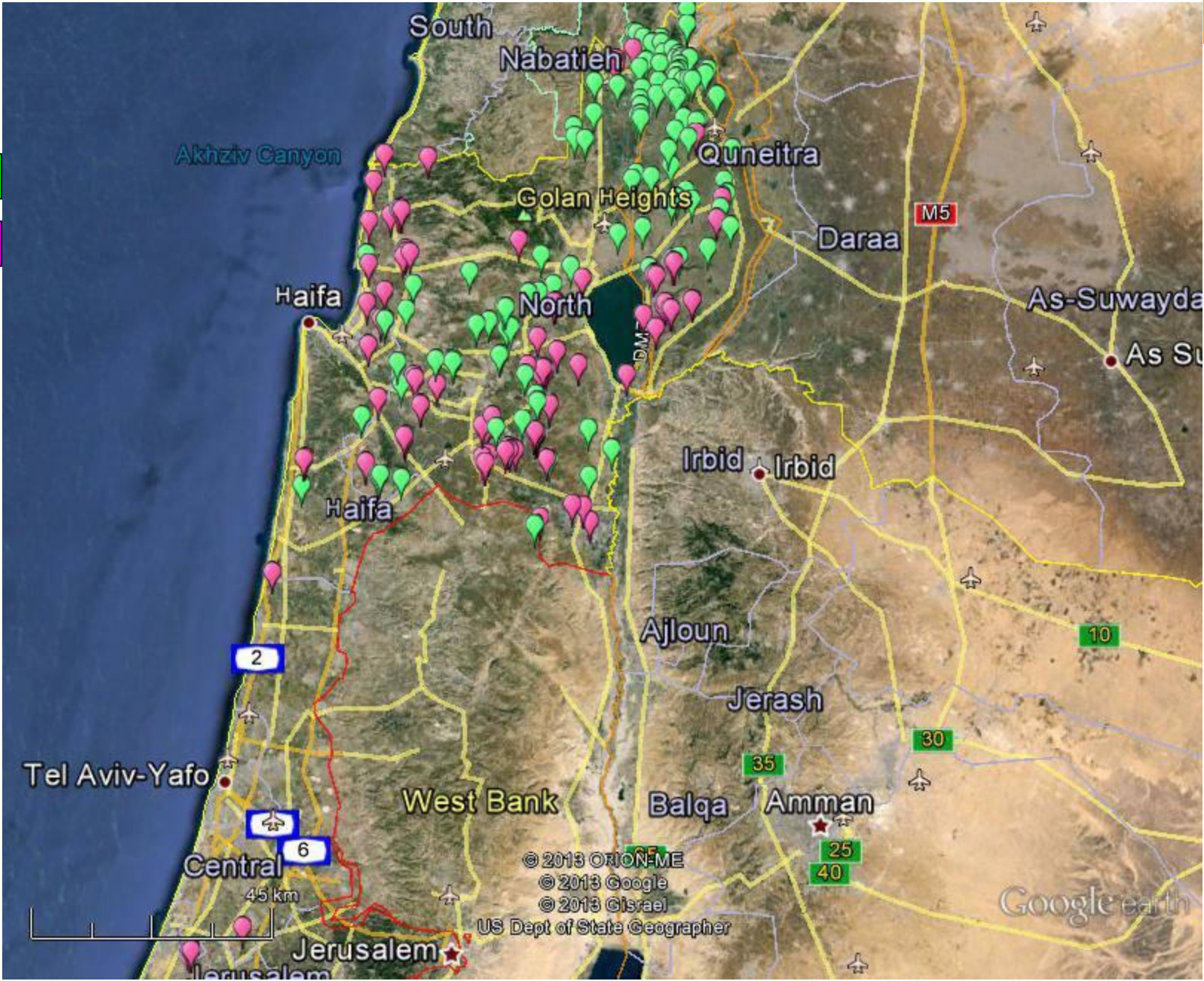
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Milk



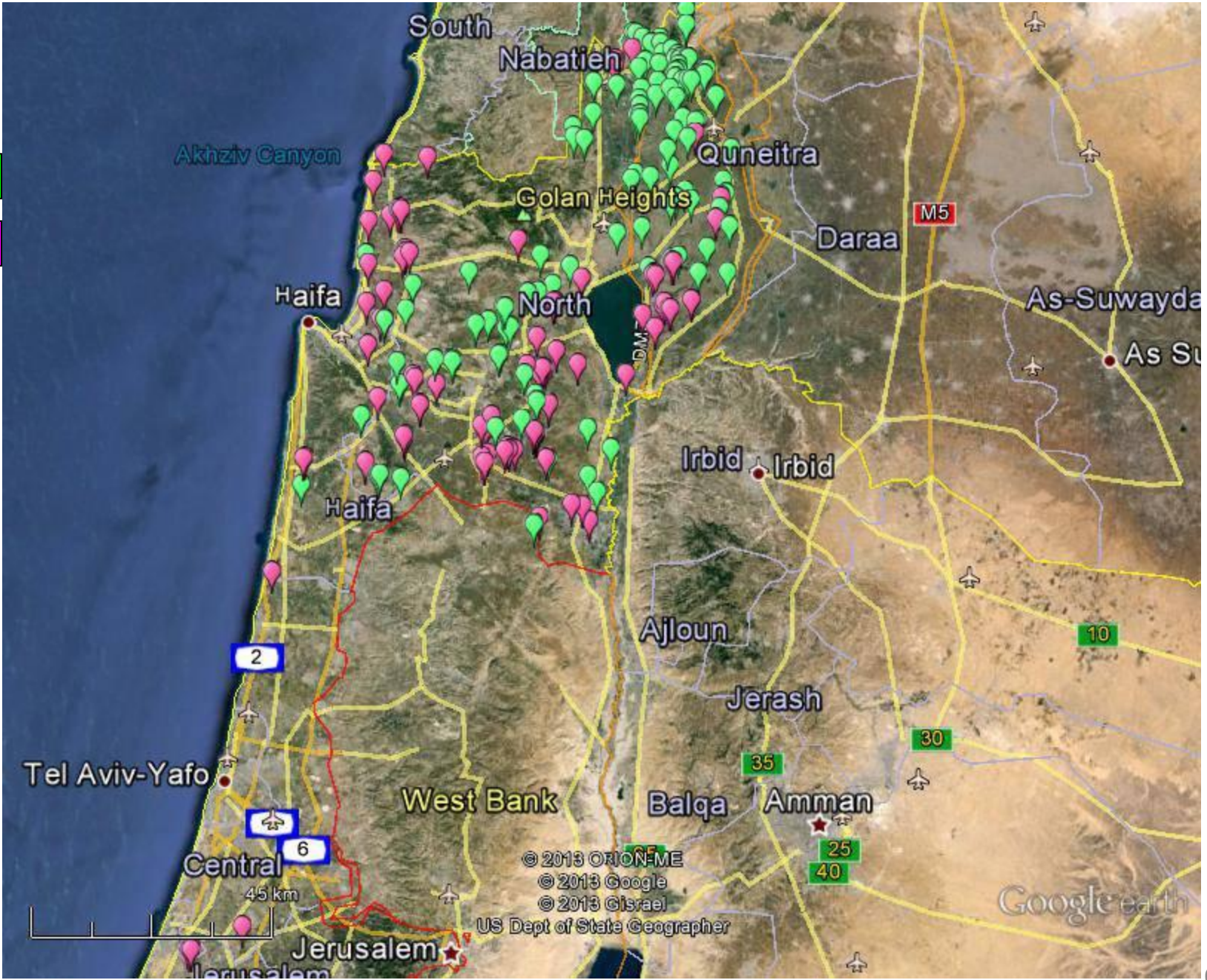
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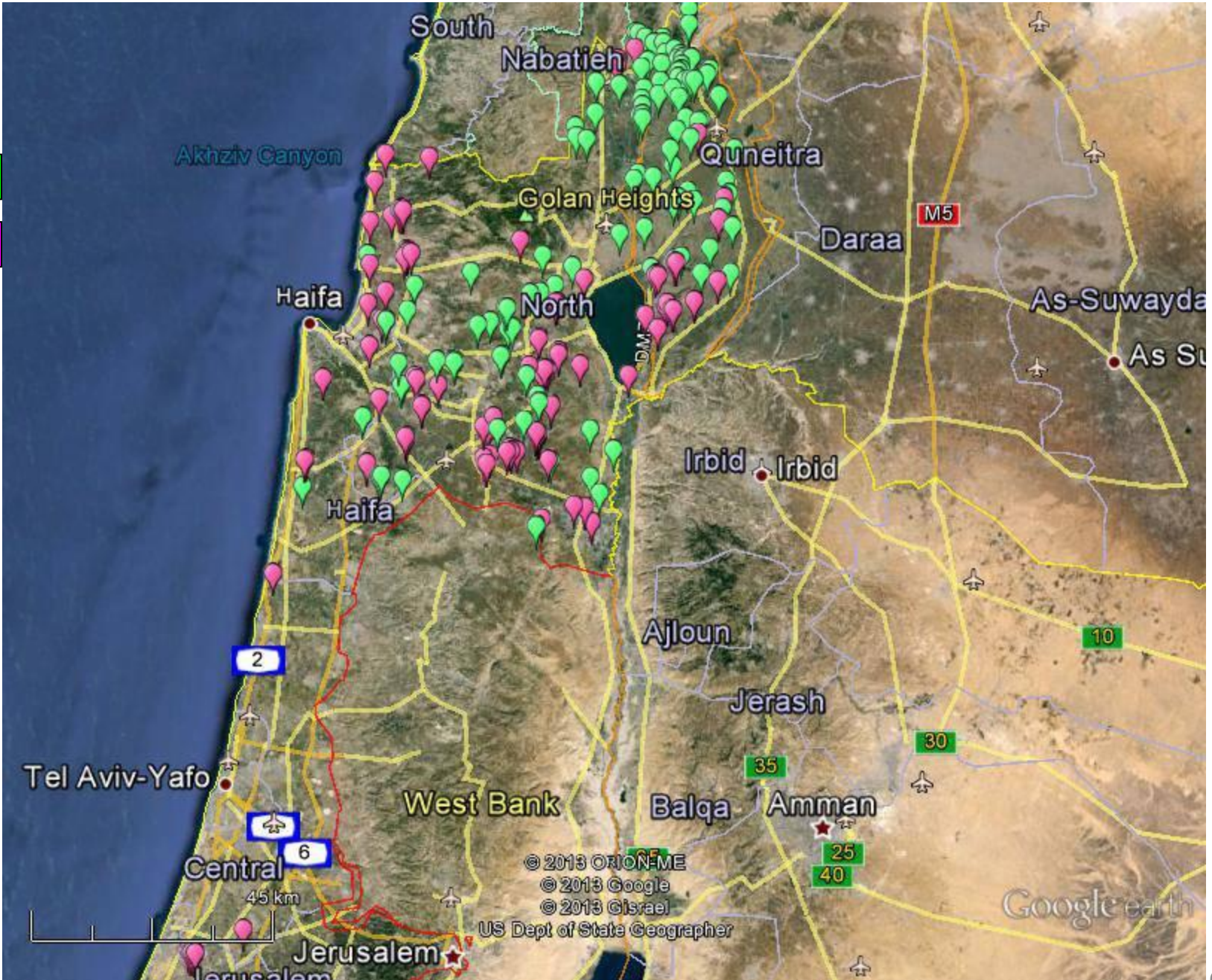
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Milk



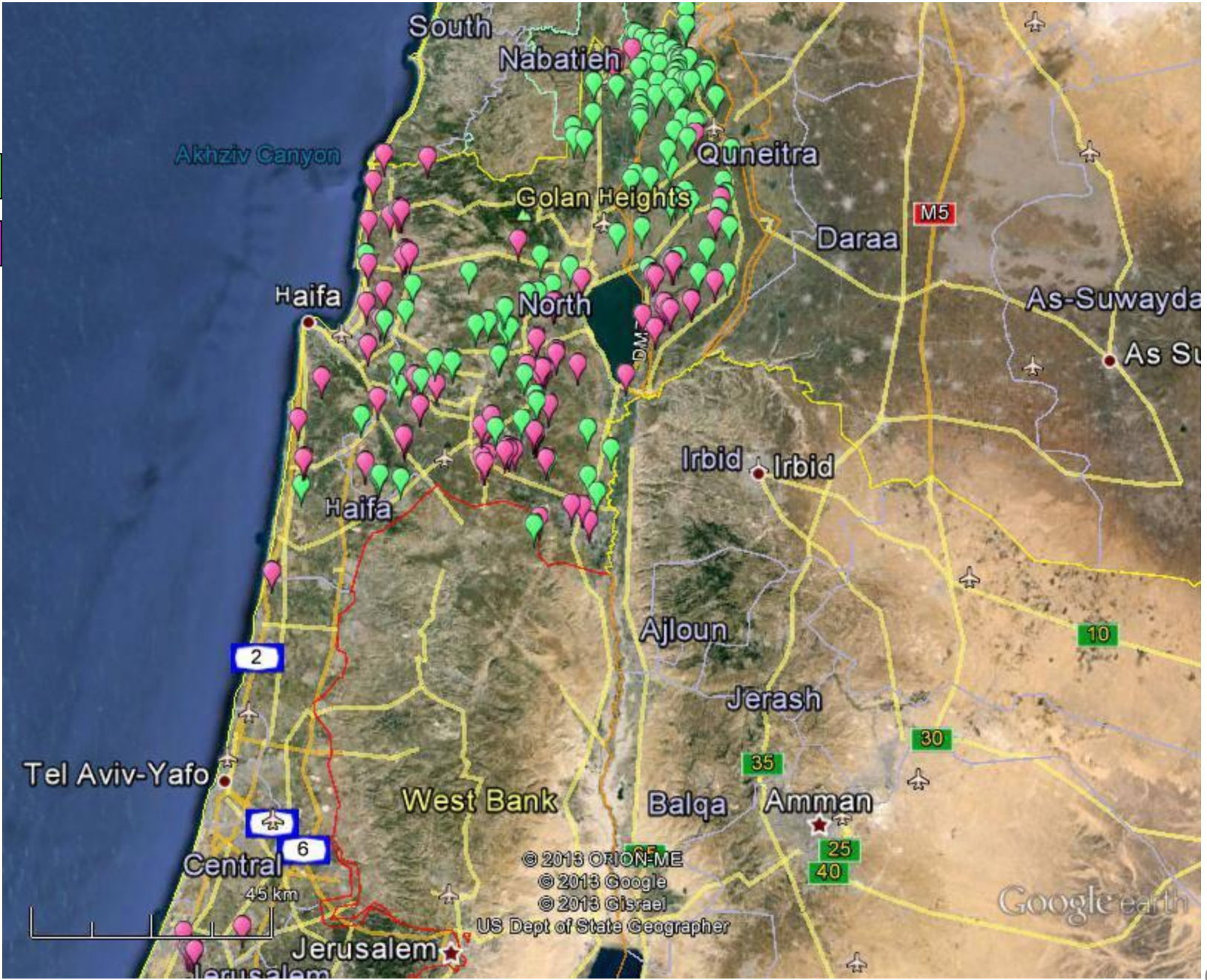
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Milk



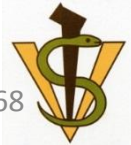
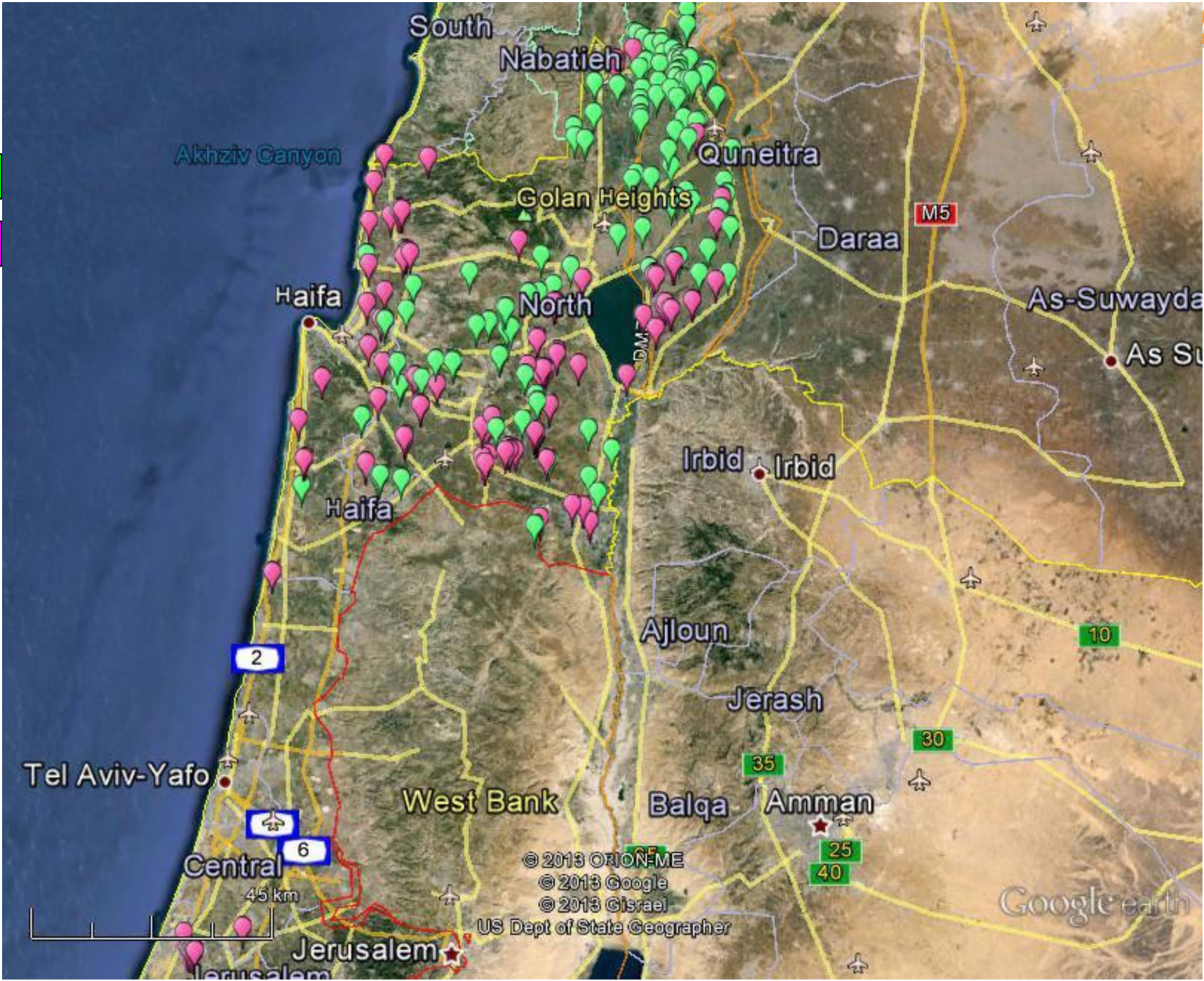
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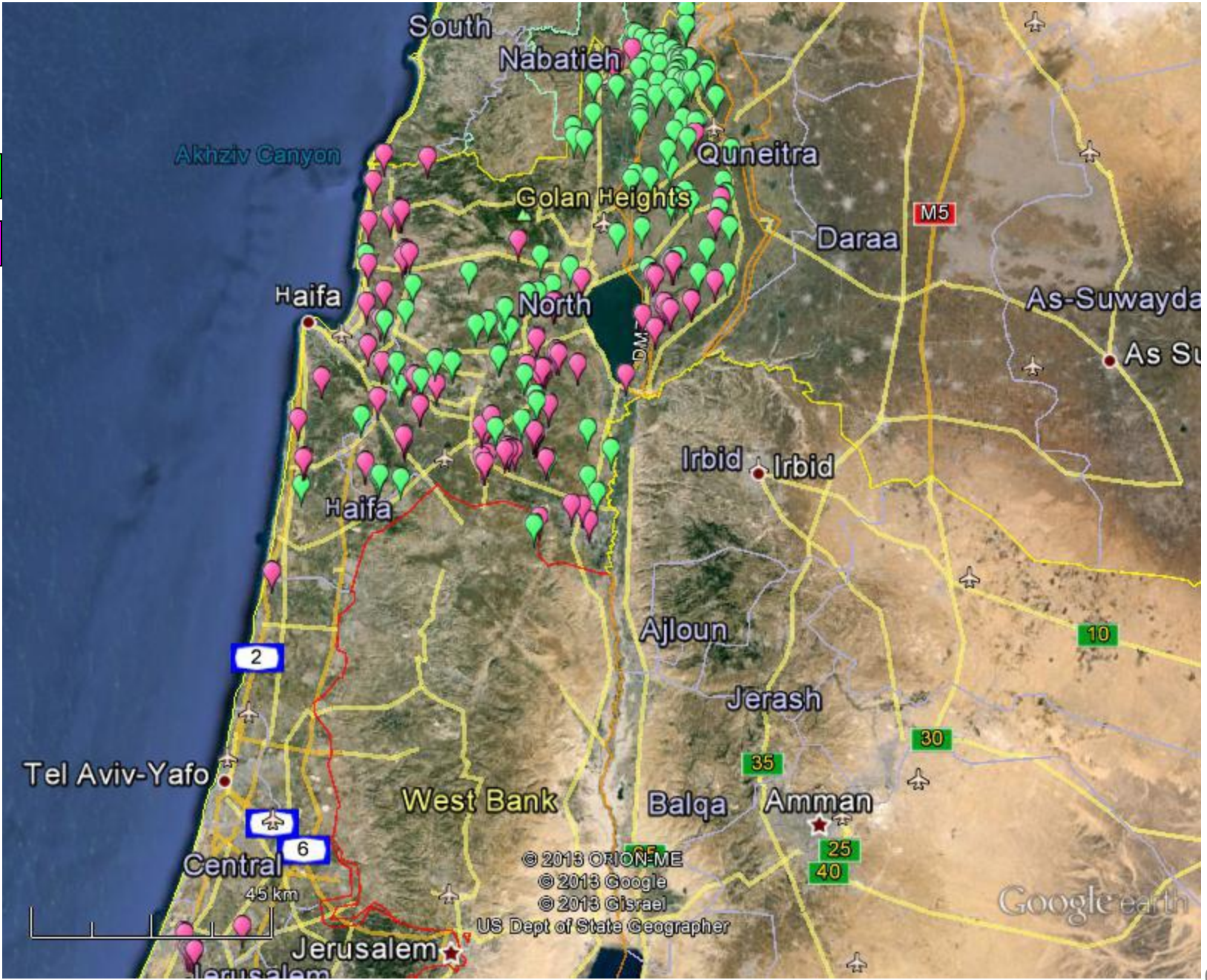
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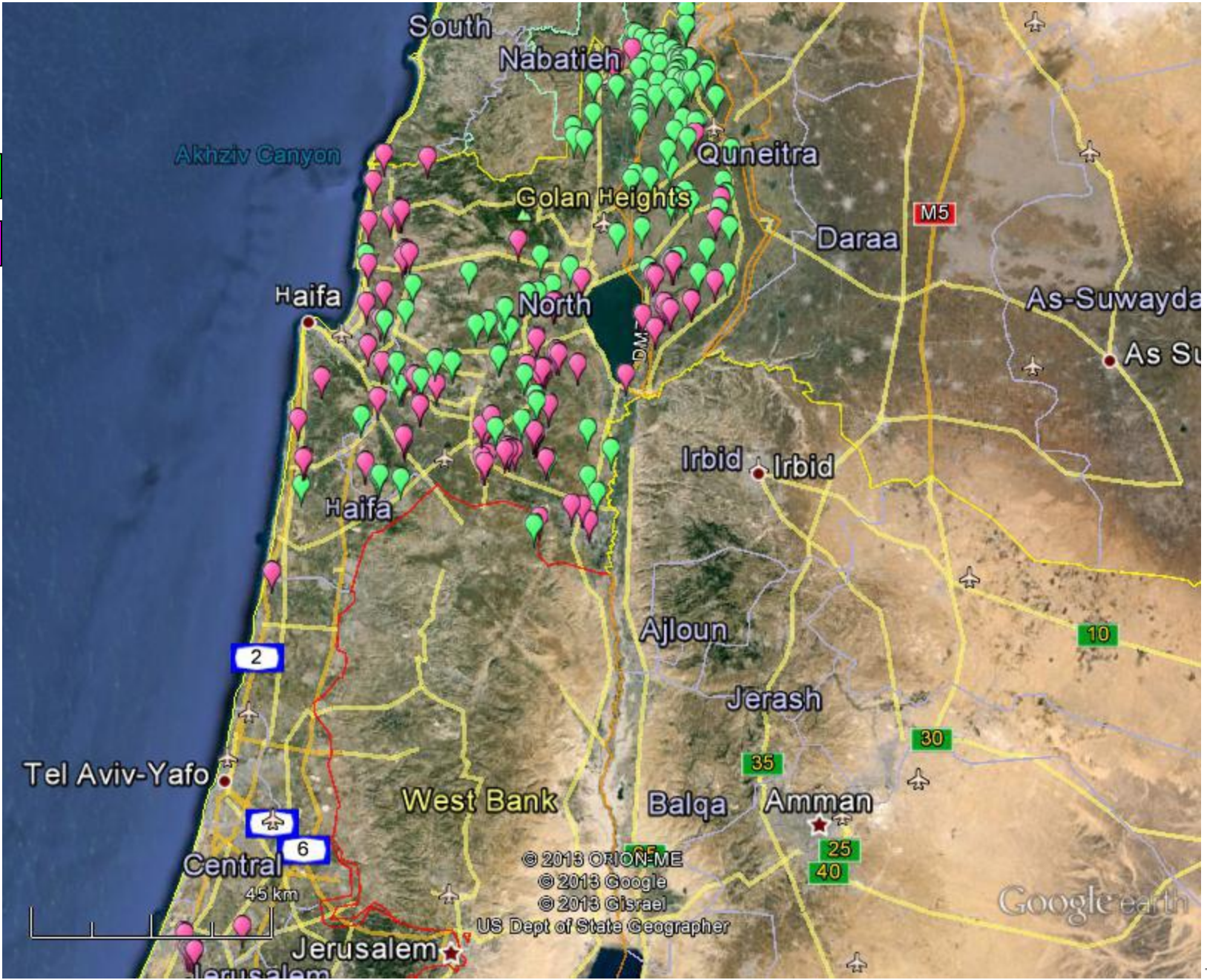
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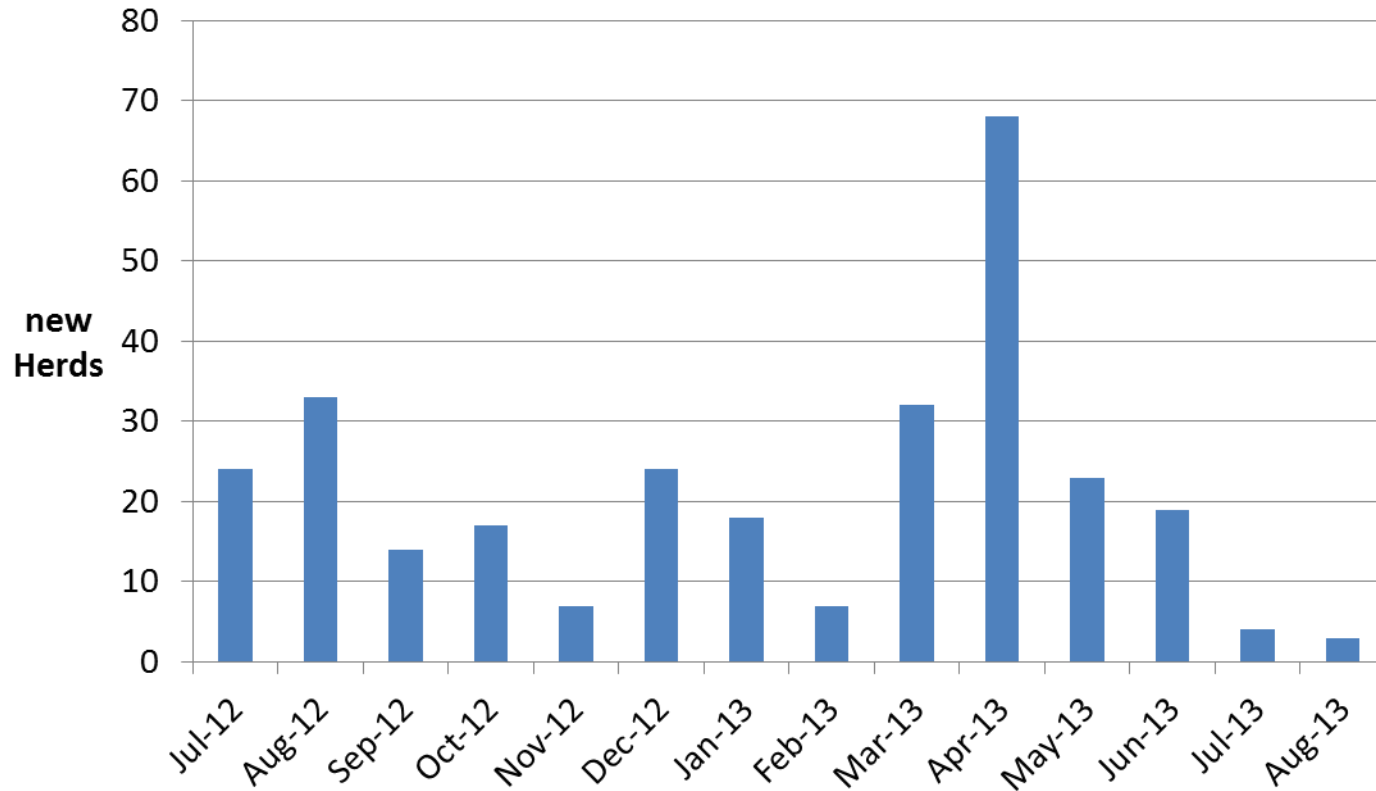


Beef

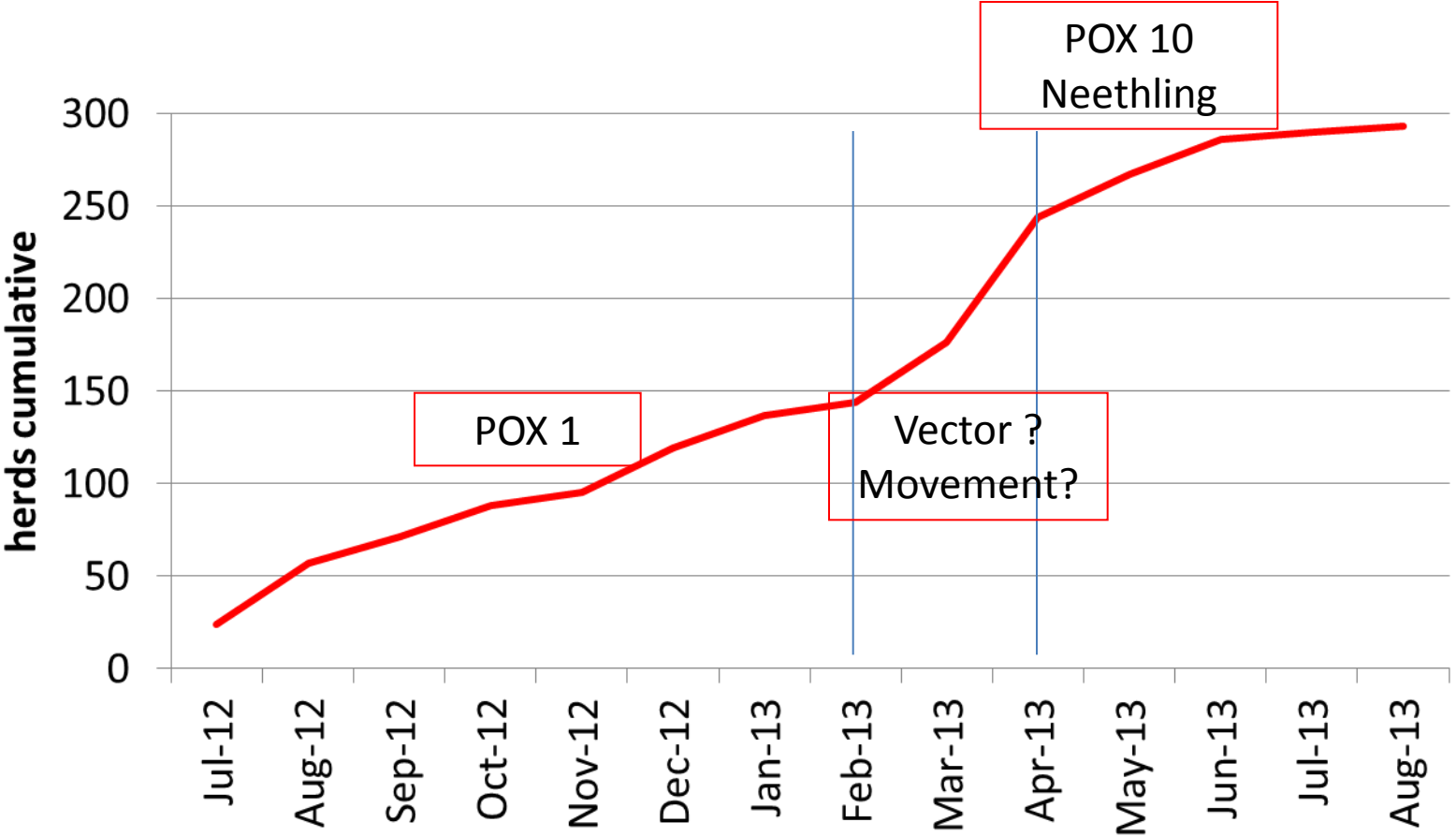
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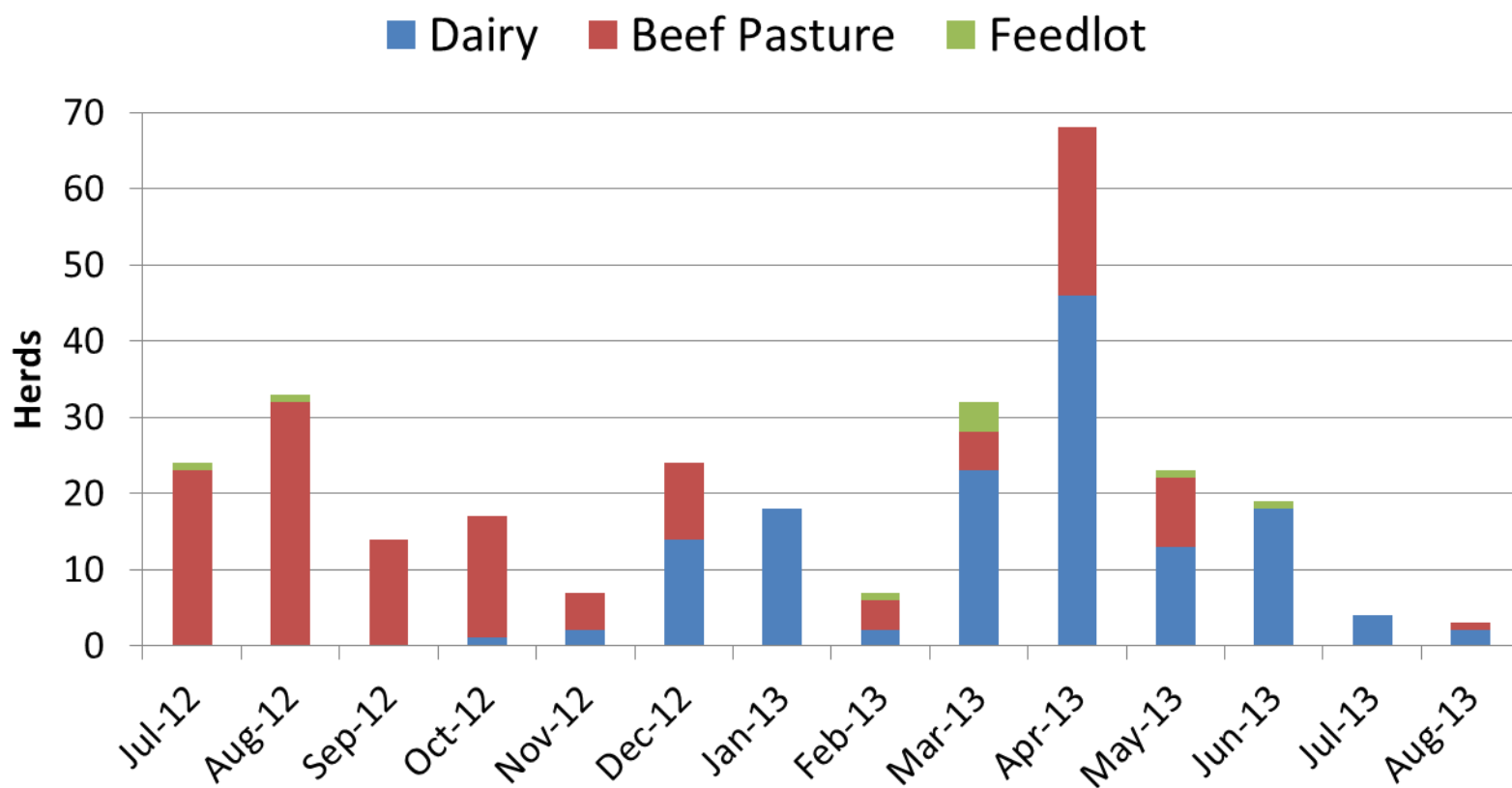
of new herds per month



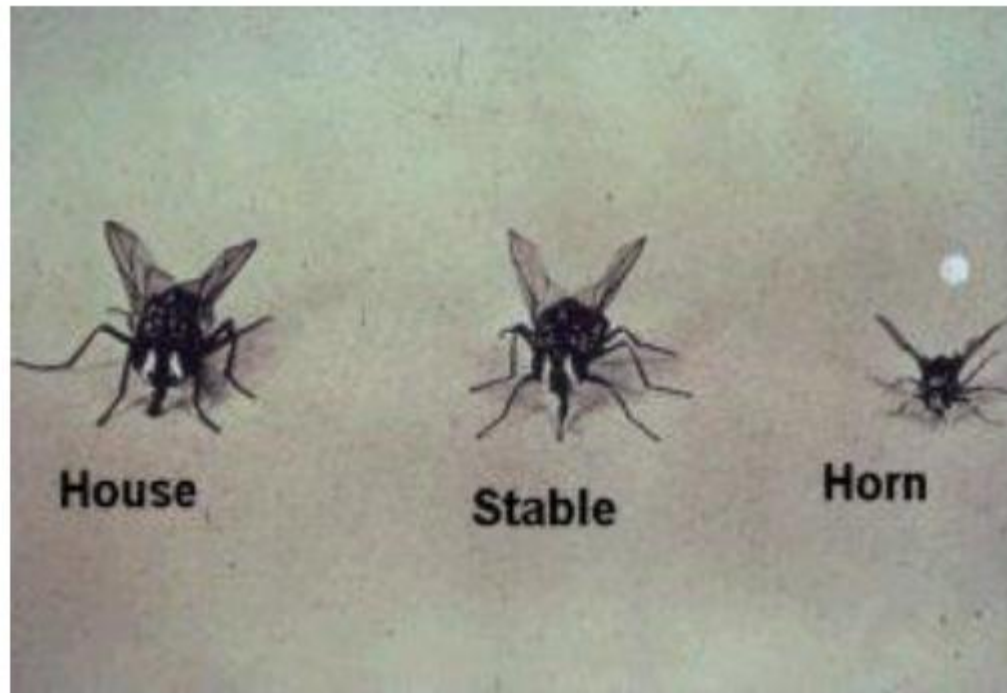
Cumulative # of infected Herds



Herd Type by Month of Index Case



Transmission - Vectors ?



Musca

Stomoxys

Haematobia

Transmission- know & don't know

- More than 1 vector
- Differ in region, season, housing
- Slow spreading (vs Ephemeral fever BEF)
- With (Horn fly) and without cattle (Stomoxys)
- No effective control

- Cattle movement: legal (un dx) & illegal
(Transit permit is required prior to moving)

Kanaf - Golan Heights



Kanaf - 5 dairy farms, 1 feedlot



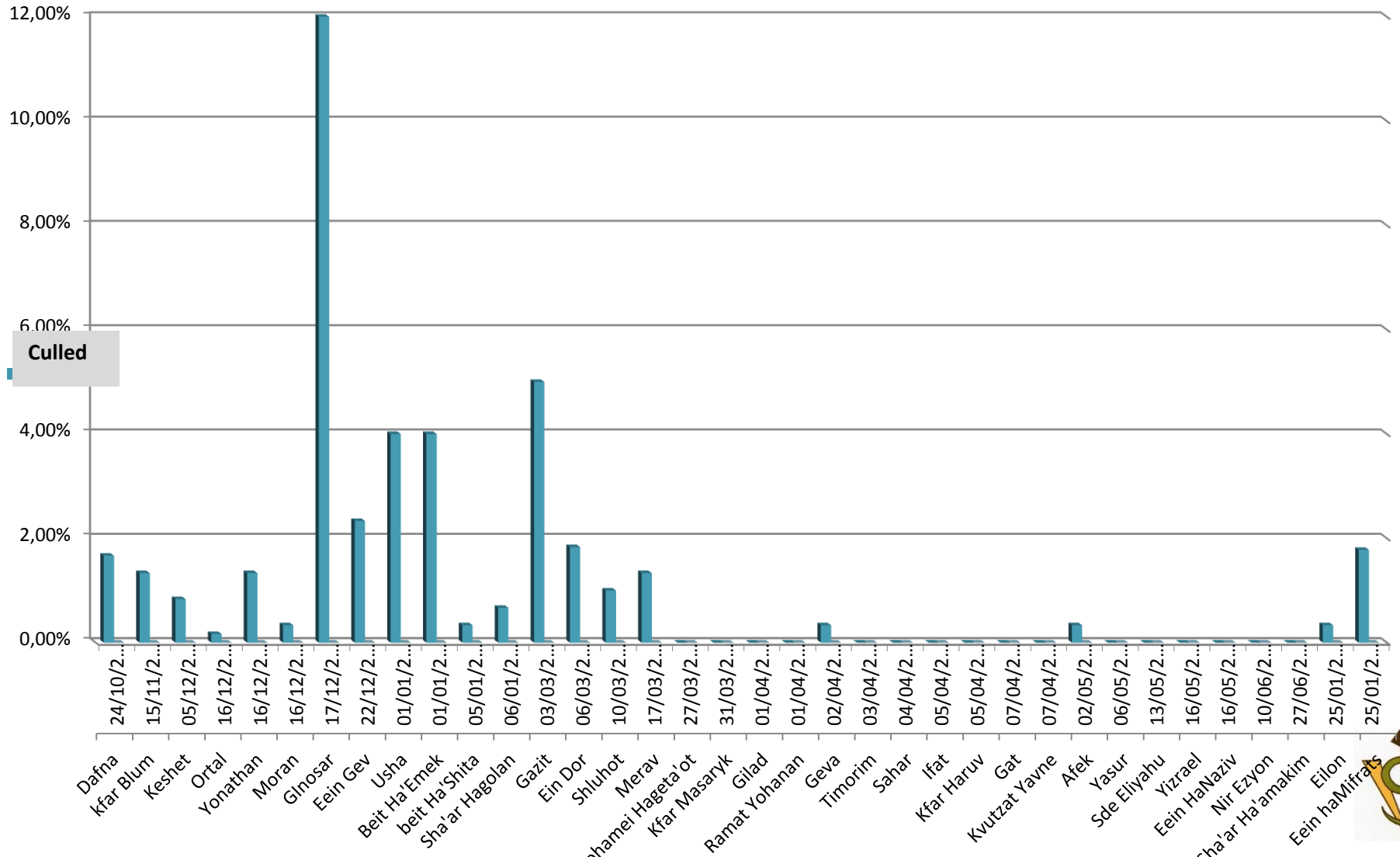
Kanaf farms - variability

Farm	Heads in herd	Moderate & Severe cases	Duration (d) first- last case
Dairy 1	219	8%	91
Dairy 2	75	16%	36
Dairy 3	50	2%	0
Dairy 4	475	2%	85
Dairy 5	40	0%	0
Feedlot	300	0%	0

Kibbutz Dairy farms LSD culling rate

moderate & severe cases were destroyed

36 herds with clinical cases ,300-1,100 milking cows.



Comparative efficiency- field trial

Neethling vs Pox-10 (10^4 2ml)

- Lab tests and field Safety trial
- March – July 2013
- 15 dairy herds >250 milking cows
- Unaffected herds near-by outbreak zone
- Each farm: $\frac{1}{2}$ Neethling $\frac{1}{2}$ Pox-10
- Clinical monitoring - VS and Vet School
- 8 farms infected

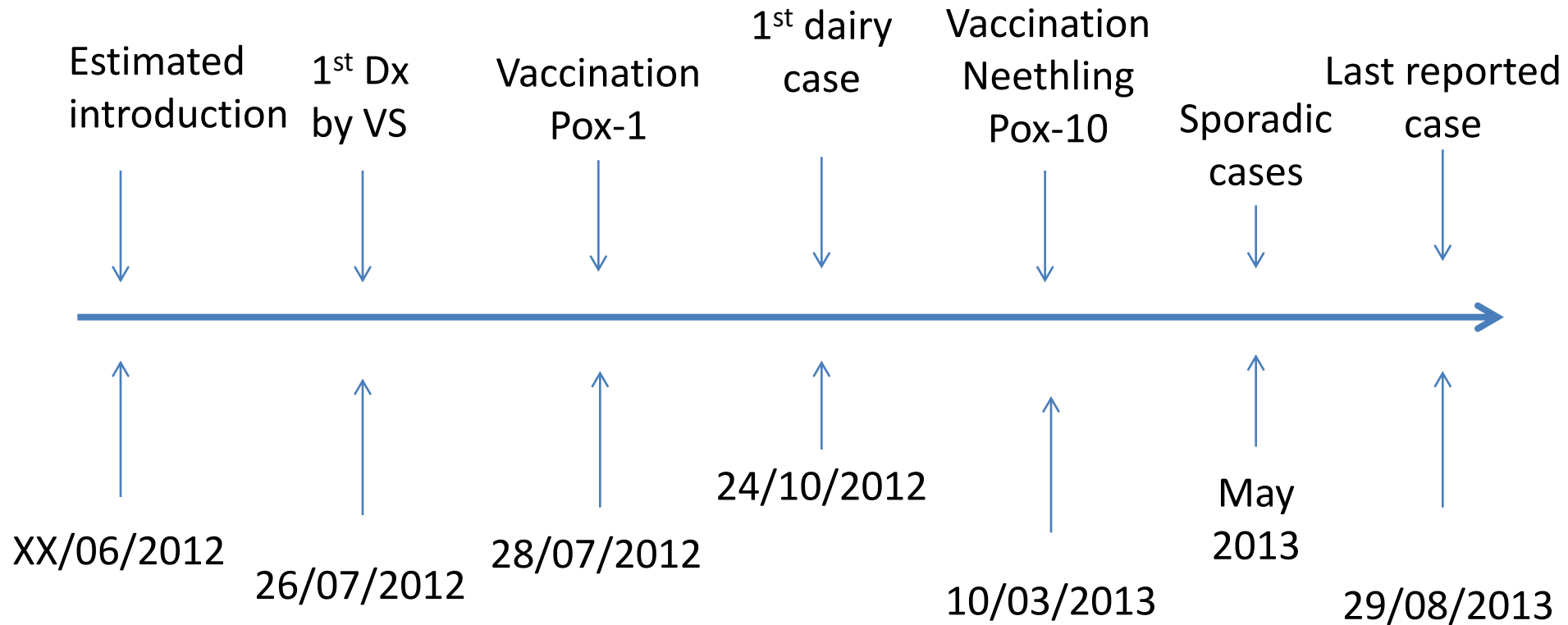
Neethling vs. Pox-10 controlled field trial results

	Neethling OBP	Pox-10 Jovac
# vaccinated	4,222	4,279
Non clinical	4,192 (99.3%)	4,178 (98.8%)
Clinical cases	30 (0.7%)	51 (1.2%)
mild	7	22
severe	23	29

Preliminary results (to be published)
Y. Ben Gera, Koret Vet School, Israel



Outbreak main events timeline



Outbreak Epidemiology

October 2013

	Beef- Pasture	Feedlot	Dairy	Total
Herds exposed	141	9	143	293
Heads exposed ~	40,000	10,000	100,000	150,000
Mortality #	561	46	25	632
Destroyed #	17	0	434	451

Total Compensations paid ~ 1 mil €

Beef Cow ~ 1,000 €

Dairy Cow ~ 2,500 €

Additional Farmers losses ~ 2-3 mil €



Legal aspects

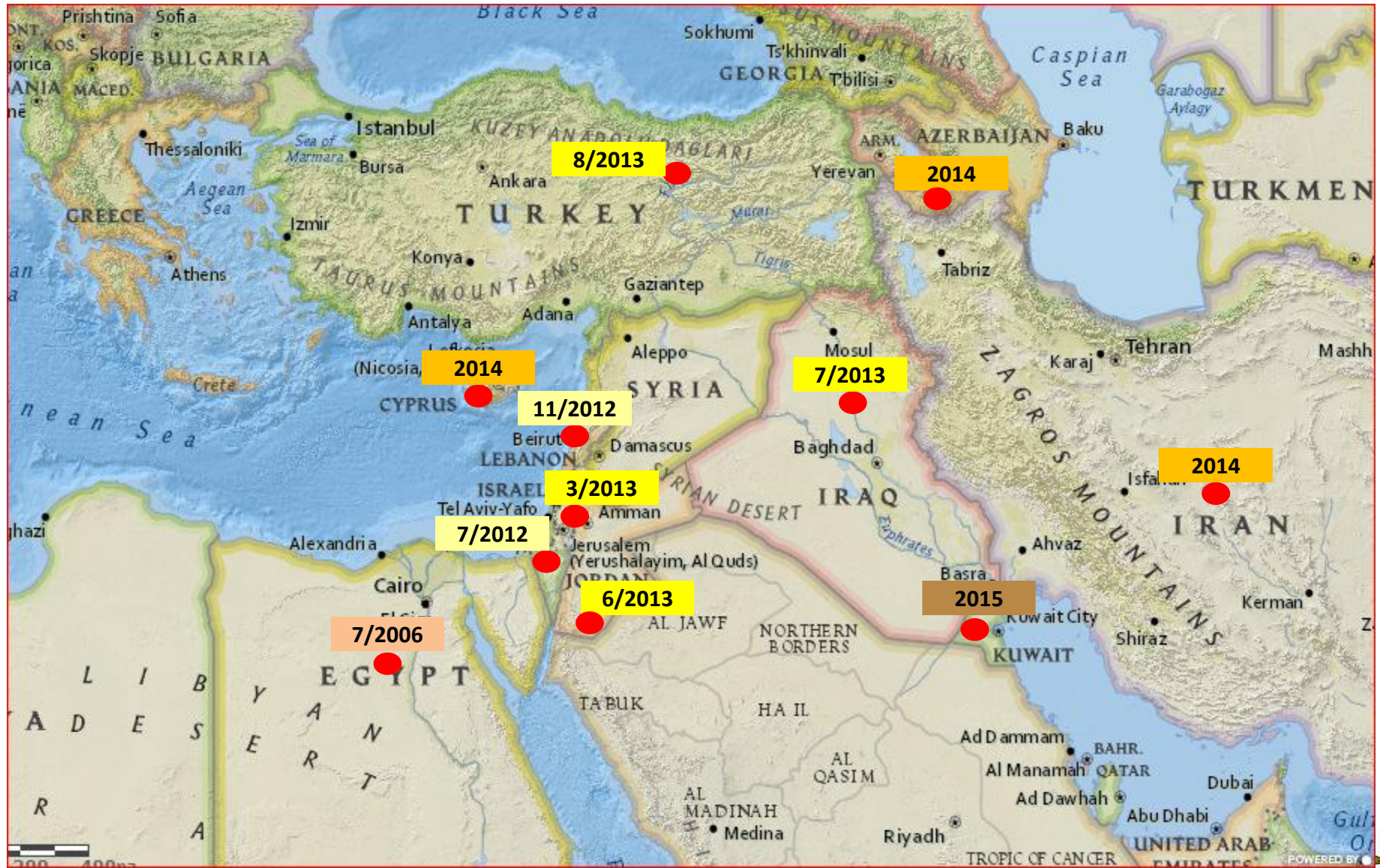
- LSD – notifiable disease
- 100% ID and computerized data
- Cattle movements – transit permit prior to move
- Emergency order to farmers to vaccinate - CVO
- Vaccination by gov't on non-gov't vets
- Vaccination coverage ~ 90% dairy 70% others
- Test & cull & compensate - CVO

National & International collaboration

- Private Vets in Israel – authorized!! to vaccinate
- Israel Vet School (Epi'- E.Klement & Ento'- Y.Gottlieb)
- Pirbright - Eeva Tuppurainen – field visit Sep. 2012
- PA, Jordan, Turkey, Cyprus, Greece
- OIE – Larnaca meeting Feb. 2013
- EFSA - workshop- Israel data presented
- EU – correspondence



LSD notification to the OIE



Current RA

- Regional epi' picture unclear
- ... threat still exist
- Mandatory Vaccination (reevaluated annually)
 - Order farmers
 - Performed only by private Vets
 - 2 vaccines available
 - Neethling (~ 1€/ dose + 0.4 /injection)
 - Abic “pox 10” (0.4/ dose)

Future Challenges

- Active surveillance – “hot spots”
- Research (KVI, Koret Vet School)
 - Epidemiology
 - Entomology
 - Vaccine – efficient, safe, affordable
- Regional collaboration & training

“Have more questions than answers”

thank you - Efharisto



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