Mediterranean fruit fly (Ceratitis capitata)
Dr Sonya Broughton

1842 – reported from Spain (Africa)
1855 – Tunisia
1895 – Medfly noted from Claremont (WA)
1897 – reported from soft fruit at several places along the Swan River, chiefly around Guildford
• Eradication considered at the time by WA Agriculture Department
1898 – NSW
1901 – Brazil
1907 – Hawaii
1909 – Victoria
1915 – Greece
1929 – Florida
1942 – Mauritius
1963-1995 – Chile (eradicated)
1975 – California
1996 – New Zealand (Auckland; eradicated)
Historical occurrence locations

A history of fruit fly in WA

1901-1910 – George Compere engaged by Agriculture WA to find and import parasites for fruit flies between 1904-1910
1905 – Leslie Newman appointed to rear insects collected by Compere - species of beetle predators (Staphylinid) from Brazil – larval and pupal predator
1908-1910 – 250,000 egg parasites from India (Aceratoneuromyia indica, Eulophid) released at Guildford – did not establish
1914 – most growers on Swan Coastal Plain abandoned growing susceptible fruits such as apricot
1940s – methyl bromide used for post-harvest disinfestation of fruit fly
1947 – community baiting schemes widely adopted in Western Australia
1950s – organophosphates such as DDT introduced for fruit fly control
1960 – dimethoate and fenthion registered for use in cover sprays
1959 – 1962 - 43,000 parasitic wasps - Diachasmimorpha tryoni, Fopius arisanus, Fopius vandenboschi, Psyttalia incise) collected from Hawaii by CSIRO released at 11 locations including Carnarvon
1970s – post harvest disinfestation - ethylene dibromide for disinfestation (CSIRO/NSW Ag, WA), flood sprays of dimethoate/fenthion, cold disinfestation
  - National approach to disinfestation - Japan required all fruit exported to be free from Qfly AND Medfly (did not recognise east-west divide)
1978-1985 – Medfly Sterile Insect Technique trialled in Carnarvon
  - bisex strain, project funded by Agriculture WA – cost $230,000 (equivalent $651,000 today)
  - Eradication from state estimated to cost $20-25 million over 5-7 years
  - SIT, male annihilation, baiting – cost $8.2 million ($15.2 million today)
1993 – trapping grid established for area freedom
  - benefit cost analysis of eradicating Medfly $250 million (Ag WA; $464.2 million today)
1996 – trapping grid for exotic fruit flies established
1998 – area wide management project proposed for apple in Donnybrook/Manjimup (AP 95045), AWM carried out in citrus (CT98009)
1999 – temperature sensitive lethal strain imported from Vienna (IAEA)
1997-2001 – SIT pilot program in Kimberley (Broome: ground and aerial releases)
2001 – BCA - $70 million over 6 years (Mumford et al.) $104.3 million
  - SIT releases in South Australia (AH 01025)
  - New baits for fruit fly control – fipronil and spinosad (WA, NSW, Qld)
  - AgWA – abamectin, borax
2003 – SIT pilot program in Kalanning (WADA) – Vienna 7 strain, isolated population in wheatbelt
2005 – area of low pest prevalence for Midlands area (WADA, AGRIFresh, Moora Citrus, MT12051)
  - recommended systems approach and an end-point treatment (cold treatment)
2010 - 2015 – phase out of fenthion/dimethoate
  - Sustainable management of Medfly without cover sprays (MT12012)
    - Area wide management in Jarrahdale
    - Field trial new cover sprays (neonicotinoids)
    - Mass trapping (Magnet MED)
    - New lures for Medfly (TML plugs, trap designs)
A history of fruit fly in WA

2014 – present – pilot project eradication of Medfly from Carnarvon
- Royalties for Regions., DPIRD, HIA - $3.9 million

2015 – dimethoate/fenthion removed from use

2017- Oxitec (HG13038) – glasshouse trials indicated that flies were comparable to V7 males irradiated at low doses; trial halted due to concerns about ‘GM’ eggs in fruit affecting international market access

2018 - Systems approach to fruit fly management (CSIRO, NSW, Vic, WA)
Medfly being considered for eradication as part of a national project

Summary of advances - incremental

Biological control
- Parasitoids – incorporated into sterile insect release programs e.g. Hawaii

Monitoring
- Trap design – ongoing experiments, designs
- Automated systems

Male attractants
  - Male annihilation technique

Food based attractants
- Two-three part lure (1995) → mass trapping
- Females and males (but differences in temporal/spatial distribution not known)

Bait sprays
- Lead arsenate (1920s) → DDT (1947) → dimethoate/fenthion (1960s) → Malathion (1970)
  - Photoactive dye (1992-2000) – failed to be registered

Sterile Insect Technique
- Bisex strain → pupal colour variant → temperature sensitive lethal → self-limiting strain (Oxitec)
Thank you
Visit dpird.wa.gov.au

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