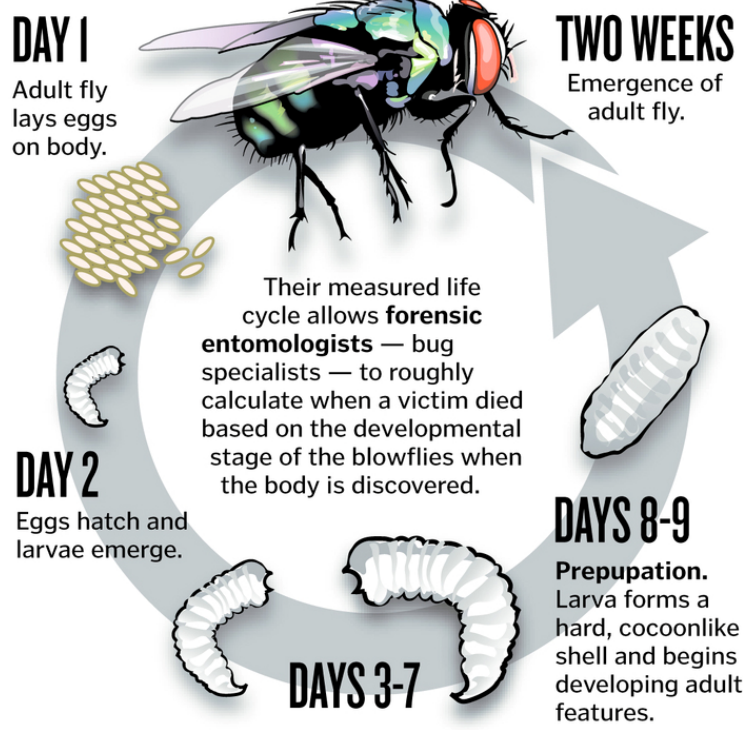
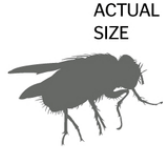
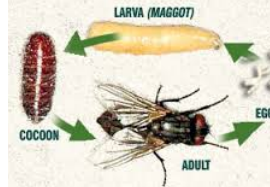


The life cycle of a blowfly

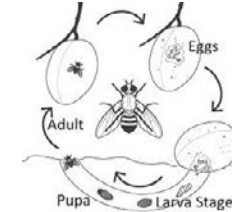
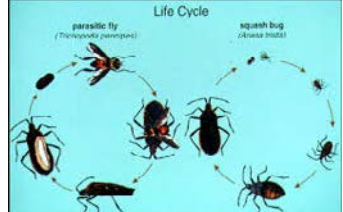
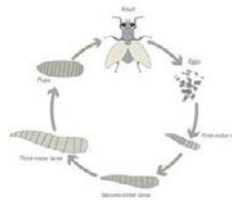
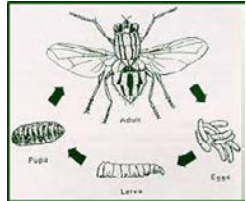
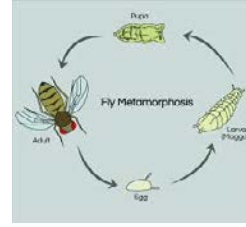
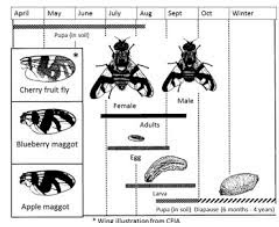
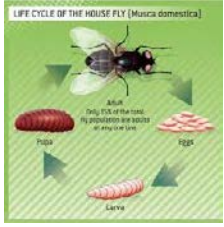
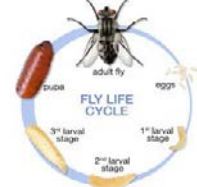
It never takes these insects long to make their way to a decomposing body, and the first thing they do when they get there is lay eggs. This timeline is based on a constant temperature of 70 degrees.



SOURCE: Michigan State University Dept. of Entomology

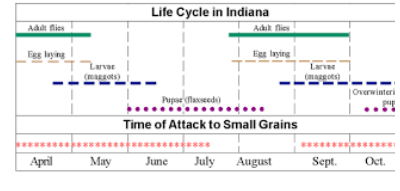
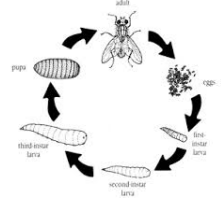
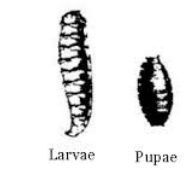
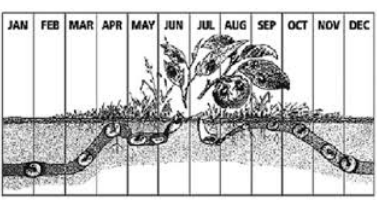


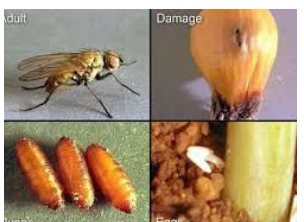
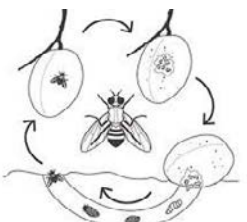
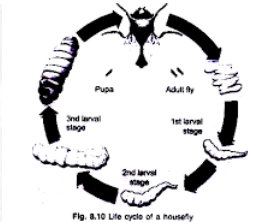
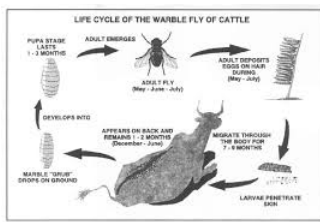
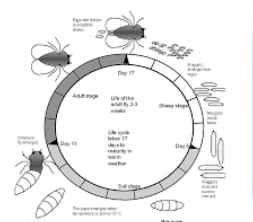
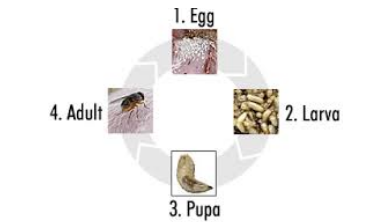
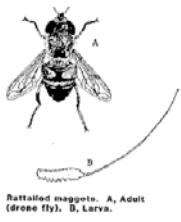
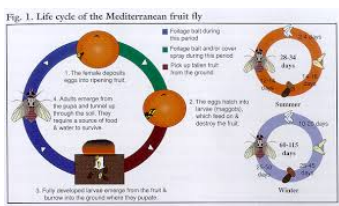
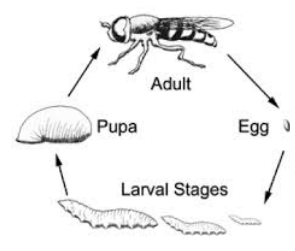
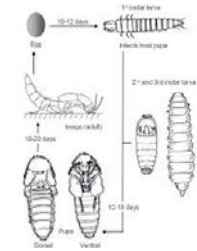
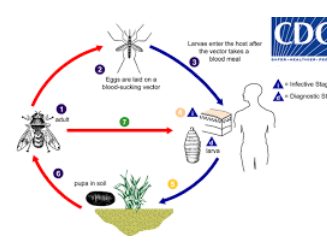
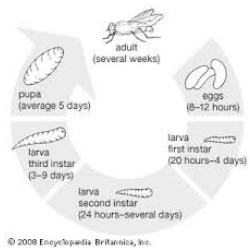
The lifespan of a maggot is around 8 - 10 days, after which they molt into the pupal stage and turn into flies.

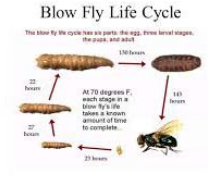
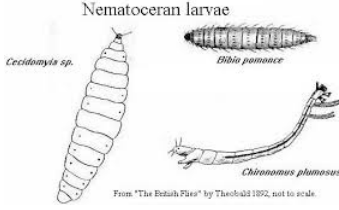
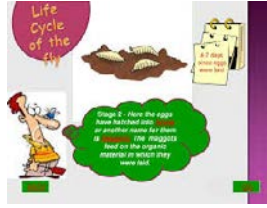
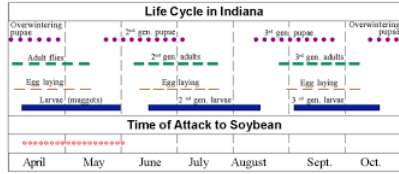


MELANOGASTER LIFE CYCLE

- DAY 0: Flies are added to freshly prepared cultures.
- DAY 8: Multiple generations of different larvae are in larvae.
- DAY 10: Larvae migrate up the culture and pupate.
- DAY 12: Pupae develop as they mature overnight.
- DAY 14: Adult flies emerge.
- DAY 20: End of Culture.

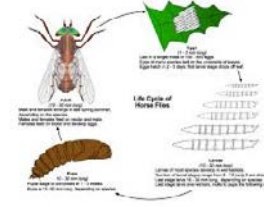
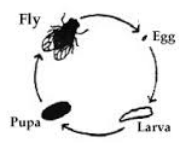
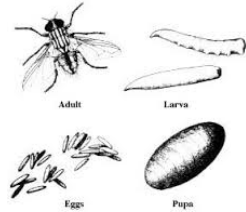




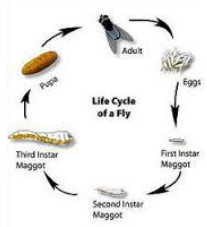
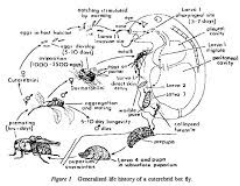
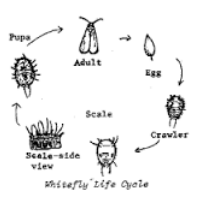
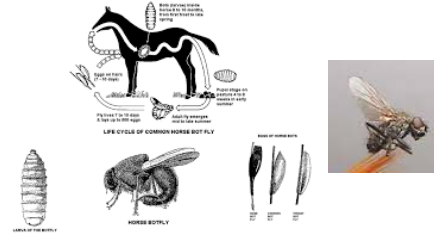


Reintroduction of Medicinal Maggots

- By the 1940s more than 300 American hospitals used maggots however after WW II and the discovery of penicillin, maggots ceased the practice to continue.
- In 1993, Dr. Ronald Shoen was established by breeding *Cecidomyia* at the VA in Long Beach, CA to reintroduce maggot therapy for its growing population of antibiotic-resistant bacteria and more treated a controlled clinical trial for spinal cord patients with pressure ulcers who had failed to respond their wounds with conventional methods.
- In 1988, the FDA granted permission to produce and market maggots for use in humans as a prescription only medical device for "treating non-healing necrotic skin and soft tissue wounds, including pressure ulcers, venous stasis ulcers, traumatic foot ulcers and non-healing post-surgical wounds."
- In 2006, approximately 50,000 treatments were applied to wounds. Today over 4,000 healthcare practitioners at 800 US centers using maggot therapy.
- In 2007, a pilot trial was found to successfully treat patients whose wounds were infected with MRSA, however the final results have yet to be published.

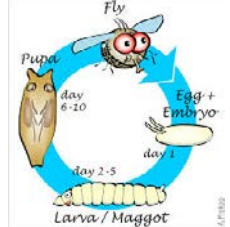


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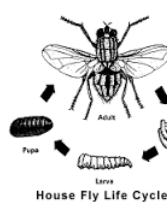
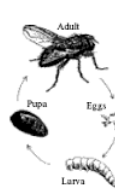
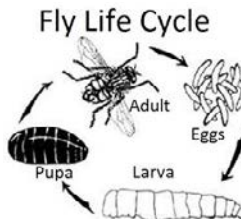
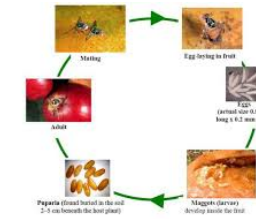
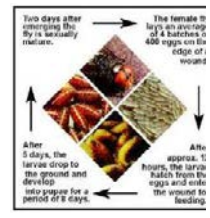
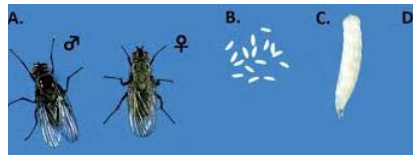
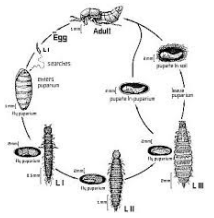
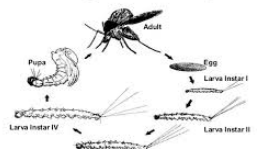
House fly- life cycle

- Egg- 150-200 eggs/sitting
1mm long, pearly white
2 longitudinal ridges in dorsal side
- Larva (maggots)- white segmented(13)
footless, worm like, 1/2 inch, narrow anterior end & broad posterior end
no eyes / appendages





Life cycle of sandfly





How to Disrupt Fly Life Cycles



4. Living things Grow and Develop

- Life Cycles
- Life cycle of a butterfly—egg—caterpillar—pupa (chrysalis)—adult butterfly
- Life cycle of a fly—egg—maggot—adult fly
- All living organisms grow at least part of their lives.



Nature and symptoms of damage

Larva in damaging stage

The infestation starts 20 days after seedling emergence and continues 60-90 days.

In the early stage: Juniper larvae feed on the surface of seed coats and eat where causing pin holes / shot holes on the surface of newly opened leaves.

The larvae bore into and eat away the internal tissues and leaves typical "V" or "heart" formation, thus killing young plants.

As the severity of seed damage increases, blind of feeding punctures and scratches appear on leaves.



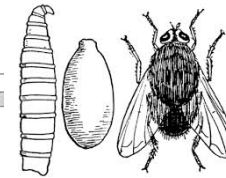
4. Living things DEVELOP and grow.

- Life Cycles
- Life cycle of a butterfly—egg—caterpillar—pupa (chrysalis)—adult butterfly
- Life cycle of a fly—egg—maggot—adult fly
- All living organisms grow at least part of their lives.
- Growth = 1/2 in size
- Develop = mature



Monitoring program	Adults first seen	Larvae first seen	Peak abundance
April	May	June	July

Control damage



Grass hoppers

Heteroglyphus bantani

Chrys melleo

Wheat maggot
Hydrotaea axyridis

Hippa
Dilobipes emarginata

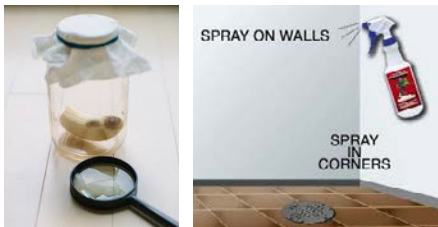
Blue beetle
Leptinopys pygmaea

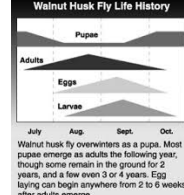
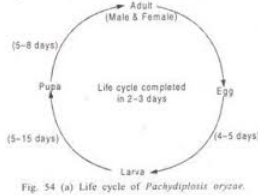
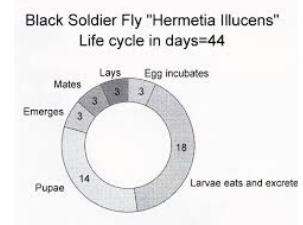
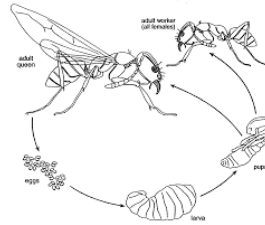
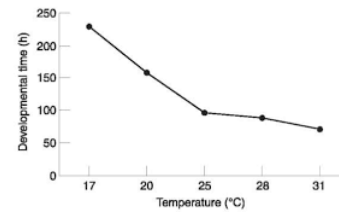


Figure 8. The adult stage of this pest is a small fly



Component Trade Name	Chemical Class	Life-stage Activity	Optimal Spiree Timing for apple maggot	Residual Activity	17 Mile Rating**	Effectiveness rating**
Carbaryl, Sevin, Malathion	Organophosphate	Adults	1-10 days after the first fly is captured	14+ days	L-M	E
Permethrin	Pyrethroid	Adults	5-10 days after the first fly is captured	5-10 days	M	F-G
Spinosad	Spinosyn	Adults	Immediately after the first fly has been captured	5-10 days	-	F
Imidacloprid, Azaela, Calypso, Check, Belay, Thrusid	Neonicotinoid	Adults	1-10 days after the first fly is captured	10-14 days	L-M	G-E
Chlorpyrifos	Organophosphate	Adults	Immediately after the first fly has been captured	10-14 days	-	F
Summit WP®	Pyrethroid/Film Penetrant	Adults	Immediately after the first fly is captured	As long as thorough coverage of the tree canopy is maintained	L	E



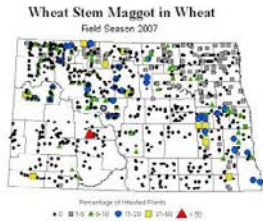
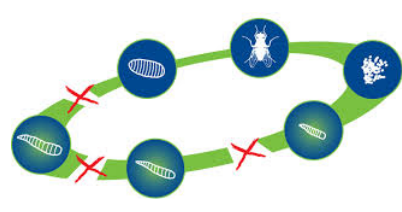
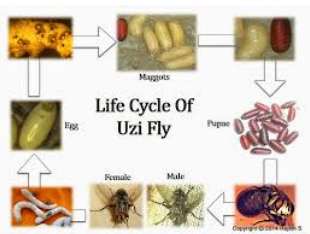
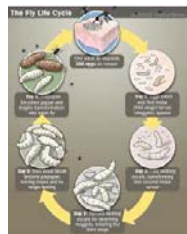


Management

Collect and destroy affected plant parts with caterpillars

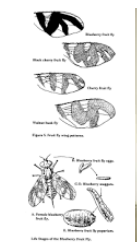
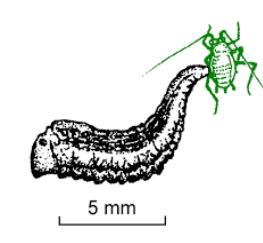
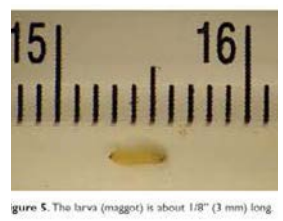
Set up light trap @1-2/ha to attract and kill the adults

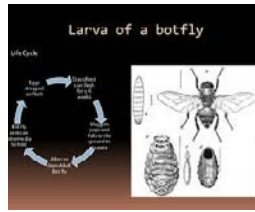
Spray malathion 50 EC 1 ml/lt



Common Insects of Decomposition

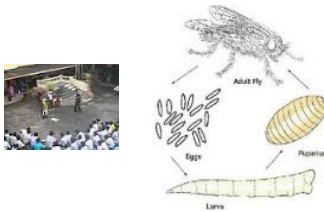
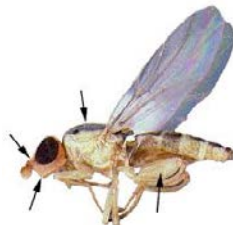
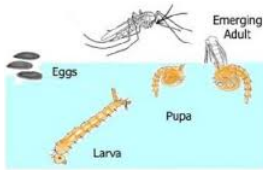
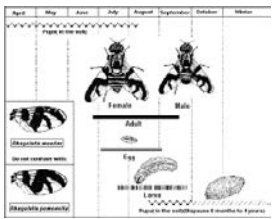
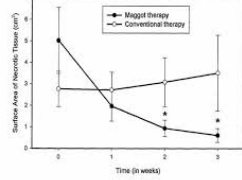
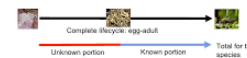
- Any insect containing maggot stage of life
 - Most common is blow fly
- Tiny wasps - lay their eggs
 - Larvae live inside maggots as parasites
- Cheese Skippers
 - Attracted to seeping bodily fluids
- Mites and Beetles
 - Favor drier conditions





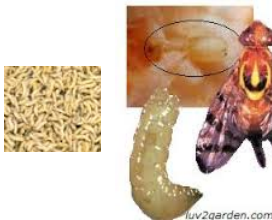
Data for Controlled Rearing

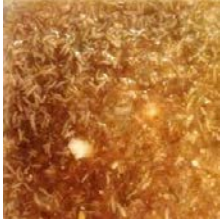
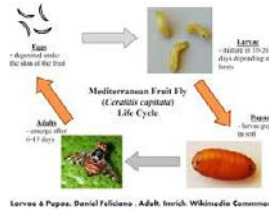
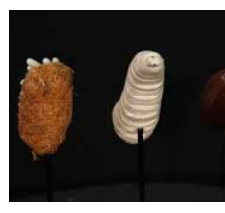
Species	Lower Threshold (°C)	ADH	ADD
<i>Phaenicia sericata</i>	10	4140 - 5812	173 - 242
<i>Phormia regina</i>	10	4038 - 6300	168 - 254
<i>Calliphora vicina</i>	6	17678	737
<i>Cyrtopogon labronicus</i>	6	5511	379



1. Life Stages of the Sugarbeet Root Maggot

Forensic Entomology
 The study of insects in relation to a criminal investigation.
 Insects arrive at a decomposing body in a particular order and then complete their life cycle based on the surrounding temperature.
 By collecting and studying the types of insects found on a body, a forensic entomologist can predict the time of death.
"When one biological clock stops, others begin."
 —Neal Haskell, reknown forensic entomologist





1. [Mediterranean Fruit Fly](#) - [Ceratitis capitata](#) (Worm)

WILDLIFE RESEARCH AND MONITORING BY THE BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

INTEGRATED MANAGEMENT OF MEDITERRANEAN FRUIT FLY

1. Introduction

2. Biology and Life Cycle

3. Host Plants

4. Distribution

5. Control Methods

6. References

7. Appendix

8. Glossary

9. Bibliography

10. Index

11. Acknowledgments

12. Contact Information

13. Disclaimer

14. Copyright

15. Revision History

16. Revision 1.0

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19. Reviewer: [Name]

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