ENTOMOLOGY CIRCULAR NO. 126
NOVEMBER 1972

FLORIDA DEPARTMENT OF AGRICULTURE & CONSUMER SERVICES
DIVISION OF PLANT INDUSTRY

APPLE MAGGOT, *RHAGOLETIS POMONELLA* (WALSH) (DIPTERA: TEPHRITIDAE) 1/

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SYNONYM: *TRYPETA POMONELLA* WALSH, 1867.

INTRODUCTION: THE APPLE MAGGOT, *RHAGOLETIS POMONELLA* (WALSH) IS AN INSECT NATIVE TO NORTH AMERICA WHICH ORIGINALLY FED IN THE FRUIT OF WILD HAWTHORN (*CRATAEGUS* SPP.). DURING THE PAST 100 YEARS IT HAS BECOME A PRIMARY PEST OF CULTIVATED APPLES, ESPECIALLY IN THE NORTHEASTERN UNITED STATES AND SOUTHEASTERN CANADA. SUMMER-AND EARLY FALL-MATURING VARIETIES ARE PARTICULARLY VULNERABLE, BUT HARD WINTER APPLES ARE SOMETIMES INFESTED. THIN SKINNED SWEET AND SUBACID VARIETIES ARE MOST SUSCEPTIBLE, BUT ACID VARIETIES MAY BE ATTACKED. PLUM, PEAR, AND CHERRIES ALSO SERVE AS HOSTS, BUT USUALLY THE APPLE MAGGOT IS NOT A SERIOUS PEST OF THESE FRUITS. CRAB APPLES ARE INVARIABLY INFESTED BY THIS PEST. A CLOSELY RELATED SPECIES, THE BLUEBERRY MAGGOT (*RHAGOLETIS MENDAX* CURRAN), IS IMPORTANT AS A PEST OF CULTIVATED BLUEBERRIES.

INJURY TO FRUIT IS CAUSED BY WHITISH OR YELLOWISH, LEGLESS MAGGOTS ABOUT 1/2 INCH IN LENGTH AND TAPERING TOWARD THE HEAD. THESE MAGGOTS BORE THROUGHOUT THE FRUIT, FORMING IRREGULAR, WINDING TUNNELS WHICH TURN BROWN, OFTEN CAUSING PREMATURE DROPPING OF FRUIT. WHEN THE FRUIT IS SLIGHTLY INFESTED, THERE MAY BE NO EXTERNAL INDICATION OF THE PRESENCE OF THE MAGGOTS, BUT WHEN THE FRUIT RIPENS, THE BURROWS SHOW AS DARK, WINDING TRAILS BENEATH THE SKIN. MINUTE EGG PUNCTURES AND DISTORTED, PITTED AREAS MAY SHOW ON THE SURFACE. HEAVILY INFESTED EARLY VARIETIES OF FRUIT WILL BE REDUCED TO A BROWN ROTTEN MASS FILLED WITH THE FLY LARVAE.

DISTRIBUTION: EASTERN NORTH DAKOTA AND SOUTHERN MANITOBA TO NOVA SCOTIA, SOUTHWARD TO EASTERN TEXAS AND NORTHERN FLORIDA, OCCURRING OVER THE ENTIRE MIDDLE AND EASTERN REGION OF THE UNITED STATES.

HOSTS: APPLE (*MALUS* SPP.), CHOKEBERRY (*ARONIA ARBUTIFOLIA*), CRAB APPLE (*MALUS* SPP.), CRANBERRY (*VACCINIUM MACROCARPUM*), DOGWOOD (*CORNUS FLORIDA*), HAWTHORN (*CRATAEGUS* SPP.), PEAR (*PYRUS* SPP.), PLUM AND CHERRY (*PRUNUS* SPP.).

LIFE HISTORY AND HABITS: ADULTS EMERGE FROM THE GROUND DURING EARLY SUMMER. EMERGENCE CONTINUES FOR A MONTH OR MORE, AND MANY PUPAE MAY REMAIN INACTIVE AND NOT EMERGE UNTIL THE SECOND YEAR. EGG-LAYING USUALLY DOES NOT TAKE PLACE UNTIL 8-10 DAYS AFTER THE FLIES HAVE EMERGED. THE FEMALE PUNCTURES THE SKIN OF THE FRUIT WITH HER OVIPOSITOR AND LAYS EGGS SINGLY IN THE PULP. EGGS HATCH IN 5-10 DAYS. THE MAGGOTS DEVELOP SLOWLY IN THE GREEN FRUIT AND USUALLY DO NOT COMPLETE THEIR GROWTH UNTIL THE INFESTED FRUITS HAVE DROPPED FROM THE TREE, AFTER WHICH GROWTH IS COMPLETED RAPIDLY. LARVAL DEVELOPMENT REQUIRES FROM 2 WEEKS IN DROPS OF EARLY MATURING APPLES TO 3 OR MORE MONTHS IN HARD WINTER VARIETIES. THEN THE LARVAE LEAVE THE FRUIT AND ENTER THE SOIL WHERE THE PUPARIA ARE FORMED. *R. POMONELLA* UNDERGOES A PARTIAL SECOND GENERATION IN THE SOUTHERN PART OF THE RANGE, WITH ADULTS EMERGING IN EARLY FALL. WINTER IS PASSED AS PUPARIA IN THE SOIL.

HYMENOPTEROUS PARASITES RECORDED FROM *R. POMONELLA* ARE A BRACONID WASP, *OPIUS MELLEUS* GAHAN, WHICH ATTACKS THE LARVAE, AND A TINY MYMARID WASP, *PATASSON CONOTRACHELI* (GIRAULT), WHICH ATTACKS THE EGGS. NO PREDATORS OF IMPORTANCE HAVE BEEN DISCOVERED.

IDENTIFICATION: ADULTS OF THE APPLE MAGGOT ARE SLIGHTLY SMALLER THAN A HOUSE FLY, BLACK IN COLOR, WITH WHITE BANDS ON THE ABDOMEN (4 ON THE FEMALE AND 3 ON THE MALE), AND THE WINGS ARE CONSPICUOUSLY MARKED WITH 4 OBLIQUE BLACK BANDS (FIG. 1). LARVAE ARE WHITE OR YELLOWISH TAPERED MAGGOTS SLIGHTLY SMALLER THAN THOSE OF THE HOUSE FLY. KEY CHARACTERS FOR THE SEPARATION OF THE LARVAL STAGE FROM THOSE OF RELATED SPECIES ARE GIVEN BY PHILLIPS (1946).

CONTROL: THE SYSTEMATIC DESTRUCTION OF INFESTED APPLES AND THE ELIMINATION OF HAWTHORN IN THE VICINITY OF ORCHARDS ARE CONSIDERED VALID CONTROL PRACTICES. APPLE MAGGOTS IN FRUITS MAY BE KILLED BY COLD-STORAGING THE FRUIT AT 32F FOR A PERIOD OF 40 DAYS. AN EXTENSION SERVICE ENTOMOLOGIST SHOULD BE CONSULTED FOR THE CURRENT CHEMICAL CONTROL RECOMMENDATIONS. RAPIDLY CHANGING STATE AND FEDERAL REGULATIONS GOVERNING THE USE AND APPLICATION OF CHEMICAL PEST CONTROLS MAKE THIS NECESSARY.

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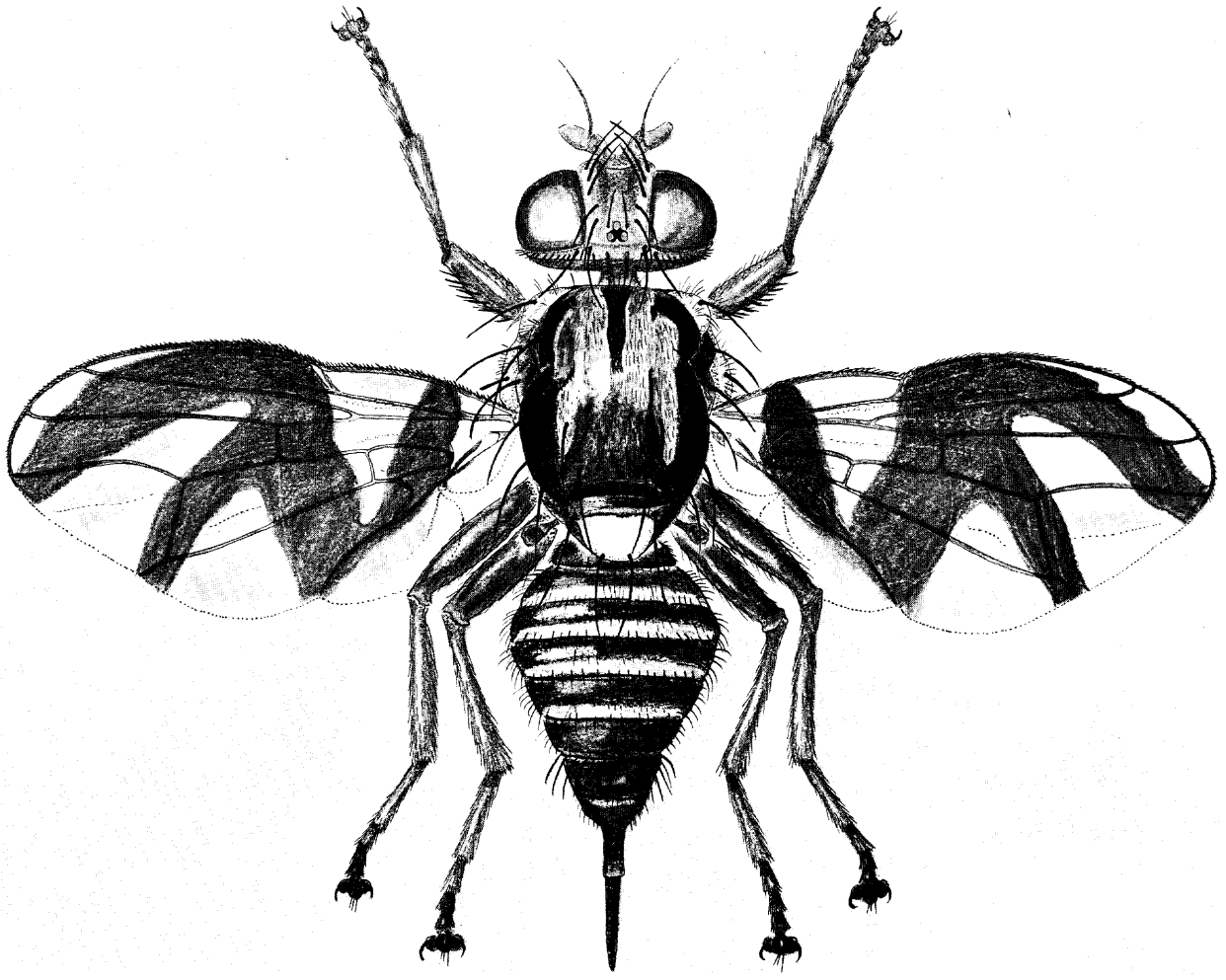

FIG. 1. APPLE MAGGOT, RHAGOLETIS POMONELLA (WALSH), ADULT FEMALE.