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Flies Commonly Found In Dwellings

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FLIES COMMONLY FOUND IN DWELLINGS

Flies are two-winged insects belonging to the order Diptera. The order is a large one both from the standpoint of the number of individuals and of the number of species.

All flies pass through four stages during development: the egg, the larva or maggot, the pupa, and the adult. The adults of all species emerge from the pupal envelope full grown and do not, as is so generally believed, increase in size. In other words, tiny flies are not the young of larger flies, but they are distinct species.

There are only a few species of flies which are troublesome in dwellings. It is the purpose of this bulletin to enumerate and discuss undesirable species that predominate in Michigan dwellings.

THE COMMON HOUSE-FLY

Musca domestica

The house-fly is a small, dusky-gray creature, measuring about one-fourth of an inch in length. The thorax is conspicuously marked by four dark longitudinal stripes and bears two delicate membranous wings. The body and legs are clothed with hair-like bristles and each of the six feet is equipped with two spongy pads, or pulvilla, which are covered with minute hairs. A sticky substance is secreted by these pads, which enables the fly to walk "upside down" on the ceiling.

The mouth-parts are fitted for lapping or scrubbing and *not for piercing*. The parts are more or less retractile, folding up under the head when not in use, and include a two-lobed structure with a rasplike surface. They are fitted for taking liquid foods only.

House-flies love the light and settle down in the direct sunshine in preference to shade. In a house, they will collect in bright rooms rather than in dark, shaded rooms. Their perception of odors is keen and serves to guide them to food. It also aids the female in locating suitable places for egg-laying.

They reproduce rapidly. It is estimated that in mid-summer from ten to fourteen days is sufficient to produce a generation of adult flies from the time of the laying of the eggs.

There is a period of from nine to twelve days after the females emerge, known as the pre-oviposition period, which period must elapse before the newly matured females begin to deposit eggs. In the latitude of Michigan many generations a year are possible in an average season. Adult individuals live from one to two months in the summer, and, according to some authors, some of them hibernate as adults through the winter months.

The white, elongate eggs measure about one-twelfth of an inch in length. They hatch in from twelve to twenty-four hours. Eggs may be laid on almost any decaying animal or vegetable matter, horse manure being apparently first choice, although cow manure serves to a lesser degree. Each female lays an average of about six hundred eggs, during her life. These are laid periodically in batches of a hundred or more. A majority of the house-flies, in this region at least, go through the winter either as larvae or as pupae.

The larvae or maggots, on hatching from the eggs, grow rapidly and in mid-summer reach full size in from five to seven days after they have hatched. The mature larvae measure about one-third of an inch in length and are white in color. The slender maggots are blunt at the tail end, while the head end is pointed.

The mature larvae, crawl to the outer part of the manure pile where it is dry and not too hot, or, better still, bury themselves in nearby soil where they find conditions more favorable. Here, each one pupates within its larval skin. This larval skin hardens and turns brown, after which it is known as the puparium. The pupal stage may last for about a week.

The house-fly is probably one of the most widely distributed insects known, about ninety-five per cent of all flies found in our houses usually prove to be of this species. Up to the middle of the nineteenth century the house-fly was looked on as an industrious scavenger, which sometimes became a nuisance. Only a few scientists even during the nineteenth century, attributed, in a vague way, the various epidemics of typhoid to the house-fly.

It has remained for the modern scientist with his improved technique and more powerful microscope to prove to the world that the house-fly is an actual carrier of such bacterial diseases as cholera-infantum, tuberculosis, and amoebic dysentery. In addition to these diseases, the house-fly is under suspicion of carrying a number of other infectious diseases.

House-flies are inquisitive creatures, sensitive to the presence of foods and they have the ability to get from one place to another in an incredibly short time. They may feed on the filthiest material imaginable, and, within the following ten minutes, enter a milk-house, kitchen, pantry, or dining-room where they proceed to clean themselves on food intended for human consumption.

The mouthparts of the house-fly are designed for taking liquid foods, and solids must be rendered liquid before the fly is capable of partaking of them. The fly regurgitates the contents of its stomach onto the surface of the solid, then draws the liquid back into the mouth. This process is repeated again and again until the insect's appetite is appeased, or until the supply of liquid in its stomach is exhausted.

It may be of interest to know that close examination will show that the majority of so-called light colored "fly specks" found on food, dishes, cupboard doors, and other places are regurgitated material from the stomach of the fly rather than excrement as is generally supposed.

Flies which have fed on, or those which have bred from human excrement, are especially dangerous to man because of the disease germs which they may have collected on their mouth parts or other parts of their bodies.

Typhoid-fever is one of the most dreaded diseases of which the fly is a vector. *Bacillus typhosus*, the causative organism of typhoid-fever, when found outside the human body can always be traced to feces, or to the discharges of a typhoid patient or of some convalescent or "carrier." There are individuals who are unknowing carriers of typhoid-fever organisms for years after they have apparently recovered from the disease. This organism is quite resistant and may live in an open vault for a long period of time. Flies from such a source, when they come in contact with food or utensils used in preparing food, are almost certain to spread infection.

It has been demonstrated that the house-fly, after feeding on discharges or sputum from a tuberculous patient, is capable of spreading the causative organism, *Bacillus tuberculosis* to food material. It is a well known fact that flies collect in numbers on sputum.

Dysentery and diarrhoea are both capable of being carried in the same manner, and even with the knowledge we have today, thousands of people die every year from these diseases, which are undoubtedly often borne by house-flies.

The number of germs of various sorts borne by an individual fly may be demonstrated by taking a fly from a closet vault and allowing it to wander about over a plate of sterile agar for five minutes. Within twenty-four hours after this is done, innumerable colonies of bacteria will be found wherever any portion of the fly's body has touched the agar, to say nothing of the colonies which are formed from the germs shaken off from the body.

Certain foods are ideal media in which bacteria may develop; among these is milk. A bottle of milk, into which a fly dropped, will spoil long before a similar bottle not so contaminated, provided both bottles are kept under identical conditions.

Dead flies should never be swept out where poultry can get to them since flies serve as an intermediate host of certain species of tapeworms especially destructive to poultry, nor can house-flies be successfully controlled by collecting the adults after they have polluted our food material. The control should eliminate or render their breeding-places unsuitable for occupancy. In cities and towns, ordinances that enforce sanitary conditions about barns, and provide for the disposal of manure, for the maintenance of sanitary closets, and for the sanitary collection and disposal of garbage will do much toward accomplishing this end. A very necessary part of an anti-fly campaign consists in the education of the people concerning the serious dangers involved, and the whole-souled co-operation of the community.

Manure should be allowed to collect for not more than two or three days in the summer, since, in this space of time, many larvae will reach a point of development that will enable them to pupate in the soil. Manure drawn to the field and spread every two or three days, dries out, and in such manure the maggots fail to mature, furthermore the fertilizing value of fresh manure is higher than the same manure when allowed to ferment and to rot in the yard for a period of months.

Manure-bins—Manure-bins furnish a very satisfactory method for the disposal of manure especially in cities or villages where it is impossible or impracticable to remove the manure every few days. The bins should have screened ventilators built in at either end and the

top should be tight, there should be a long doorway communicating with the barn so that manure may be easily passed into the bin, also the bin should communicate with the outside so that the manure may be readily emptied. Bins made of concrete are more easily cleaned and of course are permanent. Where wood is used it should be coated with coal tar or creosote in order to prolong the life of the wood.

Manure-pits—Manure composted in pits has the disadvantage of having to be handled several times, but, if the pit be properly constructed, little of the fertilizing value of the manure is lost. A comparatively small additional expense will make the pit fly-proof.

Composted-manure—Manure composted in the open, can be partially protected from flies by covering the fresh manure with old dried material from the outside of the pile.

Manure-platforms—Manure piled in a barnyard, if stacked on a properly constructed manure-platform, does not serve as a favorable breeding-place for flies. The platform should be constructed of concrete, should dip slightly toward one corner, and should be surrounded by a level concrete trough. The manure must be so stacked on the platform that none of it hangs over the outside of the trough. The trough should always contain liquid manure or water.

The larva of the house-fly, when ready to pupate, always tries to reach the soil at one side of the manure, since the heat and moisture of the fermenting manure pile is usually too great for its safety. As the larvae attempt to leave the manure they collect in the trough, and, instead of reaching the soil, they either drown in the liquid or perish because they fail to reach a suitable place to pupate.

The plan of treating manure with chemicals, to kill the maggot of the house-fly has not proved as successful as we could wish. Many of the chemicals found to be really effective in killing the maggots also reduce the fertilizing value of the manure or render it injurious to plant life. Borax, hellebore, arsenite of soda, and crude oil have been used with some degree of success as far as controlling the flies is concerned.

Borax—It has been proved experimentally that over ninety per cent of the maggots of house-flies may be exterminated when infested manure is treated with borax and water, though manure so treated is injurious to some plants when it is used as a fertilizer. The fertilizing value is not lowered for most forms of vegetation, however, when borax is used in the following proportions:

Borax	18 ounces
Water	30 gallons

Stir the borax into the water and let stand for twenty-four hours. Two and a half gallons of the mixture will be sufficient to treat the manure from one horse for a day. Where manure so treated is spread over the fields at not more than fifteen tons to an acre, but little harm is likely to result. This treatment is not so effective against flies when the manure is wet and soggy. Manure to be so treated should be piled where it will drain.

Soil in and about pig-pens, chicken-yards, garbage pits, and similar places may be treated with borax with especially good results.

Hellebore—The use of hellebore to control maggots in manure has been recommended quite highly by the United States Department of Agriculture. Hellebore, being a vegetable product, possesses an advantage over most of the other killing agents in that it does not destroy the organisms which normally assist the process of fermentation and hence it does not affect the fertilizing qualities of the manure. When fresh powder can be obtained, very satisfactory results may be expected. The hellebore should be stirred in water according to the following formula:

Water	10 gallons
Fresh hellebore	½ pound

Stir the hellebore into the water and let stand for twenty-four hours. The above amount will be sufficient to treat ten bushels of manure.

Precautions must be taken that live stock do not get to the liquid and drink, since it is poisonous to mammals and birds as well as to flies.

Arsenite of soda is sometimes used as a poison for treating manure piles. It is effective against both the larva and the adult stages, but is not generally used because of the extremely dangerous character of the poison.

The best results are obtained when made according to the following formula:

Arsenite of soda	4 pounds
Molasses	2 quarts
Water	50 gallons

The arsenite of soda is dissolved in the water and the molasses is added to make the poison more attractive to the flies.

Manure so treated loses much of its value as a fertilizer since arsenite of soda serves as a germicide, stopping fermentation which is one of the essential steps in the elaboration of plant food.

Crude oil is destructive to the different stages of flies in manure but it renders the manure almost valueless as a fertilizer.

Flies in all stages of development are killed in manure which has been cooked with live steam. This method does not permanently interfere with fermentation, and for this reason it is well adapted for the treatment of cars in which livestock has been shipped, or for treating manure which is to be spread over lawns.

It will be many years, at best, before all open toilets disappear from the small towns and rural communities. Wherever such dry closets are treated daily with ordinary building lime, chloride of lime, borax, kerosene, or crude oil, during the fly season, the treatment will prevent flies from carrying organisms back to food as well as keep them from depositing their eggs in the closets. Toilets should be made as nearly fly-proof as possible and when moved the contents of the pit should be covered with soil.

Fly-traps serve an important purpose in collecting adult flies but

it is much better to prevent the flies from reaching maturity than it is to collect them after they have scattered contamination. Various sweets, fermenting materials, or in fact anything attractive to flies may serve as bait. The flies are attracted by the odor of food and will crawl up into the trap from which they are unable to extricate themselves.

Fly-poisons—One of the most satisfactory fly poisons known consists of one part formalin to nineteen parts of water. This is attractive to flies and has an advantage over many other fly poisons in that the flies always die within a few feet of the dish. It is most effective when no other form of moisture is accessible.

There are several fly poisons on the market, the killing agents of which are arsenicals. These are dangerous and precautions must be taken to keep them out of the reach of children and where pets can not get them. Many of these poisons work slowly and the dying flies may drop all over the house.

Pyrethrum—Pyrethrum forms the basis of most of the fly powders. In preparing to use pyrethrum, darken all the rooms except one, so that when the flies collect in the one light room, pyrethrum may be blown into the air. The flies will be stupefied and drop down, after which they should be collected and burned, otherwise many individuals will recover.

THE LESSER HOUSE-FLY

Homalomyia canicularis

The Lesser House-fly is common both in Europe and in North America. It appears earlier in the season than the common house-fly and gradually diminishes in numbers as the season progresses. Next to the common house-fly, it is the species most commonly found indoors. It is more slender and slightly smaller than the latter insect which it resembles in general appearance. The mouthparts likewise are fitted for sucking and rasping.

The lesser house-fly multiplies rapidly. Two weeks of warm, moist weather is sufficient time, under ideal conditions, to produce a generation.

The larvae or maggots are decidedly different in appearance from those of the common house-fly. Their bodies are segmented and flattened, and each side is ornamented with a double row of spiny processes. The full grown larvae measure from one-fifth to one-fourth of an inch in length.

The lesser house-fly, like the common house-fly, breeds in decaying matter. The larvae occur in numbers in human excrement and has been found several times in growing vegetation. This doubtless accounts for the occasional presence of the larvae in the intestinal tract of man.

The adult of the lesser house-fly lacks the inquisitive nature so noticeable in the common house-fly. Although both species breed under the same conditions, there is less danger from the lesser house-fly

as a transmitter of disease than from the common house-fly, because the lesser house-fly will cluster and hover in mid-air in a room, or waste its time running up and down the window pane, even in a room where food is exposed.

Control:—See Common House-fly.

THE TRUE STABLE-FLY

Muscina stabulans

The stable-fly is distributed throughout the greater part of Europe and the United States. It resembles the common house-fly so closely that it is difficult to separate the two species. The stable-fly is the larger of the two, and appears earlier in the season than the common house-fly. This species is seldom numerous enough in or about dwellings to cause concern.

The life-history of the stable-fly has never been fully worked out, but Taschenberg records his belief that five or six weeks are necessary for the completion of its development. It has been bred from human excrement, decaying vegetable matter, and from growing vegetables.

The mouthparts are similar to those of the common house-fly, fitted for lapping and sucking, not for piercing. Since so few individuals of this species visit houses, there is but little danger of its carrying disease infection. There have been occasional cases where the maggots of this species have passed through the intestinal tract of man. It is probable that they were taken into the digestive tract with fresh uncooked vegetables.

Control: Until more is known of the life-history and habits of this species, the only recommendation necessary in the interest of safety is to so treat human excrement so that it will not serve as a breeding-place.

All fresh vegetables should be thoroughly washed before being served, and the flies should be kept out of houses by means of screens.

THE BITING HOUSE-FLY OR FALSE STABLE-FLY

Stomoxys calcitrans

The Biting House-fly is world-wide in its distribution. It is similar to the common house-fly in general appearance, but differs from the common house-fly in that the dark, longitudinal markings on the outer margin of the thorax are interrupted, and that the abdomen is more or less checkered. The insect in repose carries its wings so that they slope slightly downward with their tips farther apart than the house-fly carries its wings. The mouthparts are awl-like in structure and are fitted for piercing and sucking, not for rasping.

The biting house-fly is primarily a pest of livestock, both sexes feeding on the blood of animals. Even when undisturbed an individual

seldom finishes its meal in one place or even takes it from one animal, preferring to dart with swift direct flight from one place to another or from one animal to another where it instantly inserts its beak and feasts on the blood.

Horses and cattle suffer a noticeable loss of flesh unless furnished some means of protection, and dairy cattle show an appreciable reduction in milk flow during a fly plague.

The biting house-fly though primarily a livestock pest, is very sensitive to changes in temperature or barometric pressure, and long before man realizes a threatened change in the weather, it takes up its temporary abode in sheltered places where its habit of feeding on humans has given rise to the belief that "house-flies bite before rain." It frequently becomes a pest about houses in the early autumn where it seeks refuge during the first cool evenings.

Its habits are such that it is not likely to serve as a carrier of the diseases known to be transmitted by the common house-fly, but it has been, and is yet for that matter, under grave suspicion of carrying various other diseases.

The biting house-fly is somewhat slower in its development than is the common house-fly. The length of time required for development is of course governed by temperature, moisture and food supply. It has found that the minimum length of time necessary to produce a generation is about twenty-two days, the average time required being about twenty-eight days, while if the weather turns cool, as much as sixty days is required.

The adults live for a month or more. The females being from eighteen to twenty days old before they commence to oviposit. They usually crawl down under the loose material on the surface of a trash heap, and after making pocket-like holes in the more solid material underneath, deposit many eggs together therein. Each female is capable of ovipositing a maximum of six hundred to eight hundred eggs in a life time; these are laid in four or five batches, each batch varying in number and usually consisting of from twenty-five to fifty.

The biting house-fly breeds in fermenting vegetation. Considerable moisture is required by the larva in order that it may complete its development. The flies breed successfully, in the damp corners of feed-troughs in daily use, in the picked-over refuse in the bottom and under feed-stalls, in rotting hay or straw stacked in the open, in garbage, or in decaying stacks of weeds or grass. It seldom breeds in manure unless the manure contains a liberal supply of straw.

Control:

The most successful way to control the biting house-fly is to prevent its finding suitable breeding-places. Since moisture is required for the larval development, mangers, feed-troughs, and stalls should be constructed so that they will always be dry, or, if not so built, they should be thoroughly cleaned weekly or at least every two weeks in order to prevent the flies from breeding.

The contents of the trough and mangers, and the bedding from the stalls should be spread out where it will dry, and the bases of old straw-stacks, hay-stacks, or feed racks should either be burned or spread out to dry.

These preventive measures should always be followed out. In addition there are several commercial preparations or repellants on the market and some home-made preparations which are intended to be sprayed directly on the animals. Most of these repellants, however, are effective for only a few hours at best. Probably the first choice of all these sprays is

***Used Crank-case Oil and Oil of Pine-tar.**

Add a pint of oil of pine-tar to one gallon of used crank-case oil. This mixture is intended for use with an atomizer. It should be applied very lightly directly upon the animal, and only a small amount should be used at any one time.

THE CLUSTER-FLY

Pollenia rudis

The cluster-fly is known both in Europe and in America. It resembles the common house-fly in general appearance but the four, dark, longitudinal stripes present on the thorax of the house-fly are wanting, and the wings, when at rest, overlap at their bases, giving the fly an elongated, slender appearance. The cluster-fly is slightly larger than the common house-fly and has mouthparts fitted for rasping and sucking.

The cluster-fly breeds, as far as known, in about the same surroundings as the common house-fly. It has been bred from all sorts of decaying organic matter. The adults do not habitually congregate on human food, and consequently are very little to be dreaded or feared, as potential disease carriers. They go through the winter as adults, and apparently they seek the shelter of dwellings for hibernating quarters. They will collect in clumps behind pictures, in the corners of closets, under rafters in attics or basements, or back of curtains in an unused room. Screens seem to be of little or no use when it comes to keeping them out. In fact the easiest way to get them out of a room seldom used, is to remove the screens, open the windows a few inches at the top so that many of the flies will find their ways out.

The cluster-fly is slow moving, and stupid. It is troublesome only in the spring and fall and then only because of its numbers. On warm days or on the approach of spring many individuals collect on the window-pane and wander aimlessly about. It is the presence of this species in the early spring, or the finding of the clusters during the winter that has led to the belief that the common house-fly winters over as an adult.

Control:

The number of individuals will doubtless be reduced to a negligible quantity if the controls recommended for the common house-fly are followed.

*C. R. Cleveland, Jour. Econ. Ent., Vol. 19, page 529, 1926.

BLOW-FLIES

There are several species of rather cosmopolitan blow-flies, which enter houses from time to time. They breed either in open wounds or in fresh, decaying, or cured meat. They often seek the shelter of houses during a cool spell in summer and with the first cool days of autumn they are apt to appear and to buzz idly over any foods they can get at, or they may crawl slowly up and down the window panes. Such flies are considerably larger than the common house-fly, with large blue or green abdomens sparsely covered with short black spines.

Following are the species most commonly found in northern dwellings:

The large Blue-bottle fly, *Calliphora vomitoria*, lays its eggs on either fresh or decaying meat. It has been known to deposit its eggs in the open sores of wounded animals. Each female is capable of laying a large number of eggs, from four hundred to six hundred being the average. Less than a month is required to produce a generation. Its well known preference for human excrement makes this species especially dangerous.

The Green bottle-fly, *Lucilia caesar*, breeds in manure, human excrement, and in decaying or living flesh. It apparently passes the winter either as a larva or pupa.

A careful inspection of fresh raspberries, strawberries, and blackberries exposed for sale without the proper protection of screens or glass, all too often reveals clusters of eggs, presumably of blow-flies. The tiny eggs stand on end until the fruit is shaken up. After the fruit is disturbed the eggs lie down and become almost invisible due to the juices which exude from the berries and wet the translucent eggs. The mere thought of swallowing uncooked eggs of such flies should induce the house-wife to purchase all of her berries from stands properly screened so as to prevent all flies from approaching near enough to oviposit.

Control:

The control measures recommended against the common house-fly will do away with many choice breeding places of the blow-flies.

Food, especially meats and fresh berries, should always be so protected that the flies will be unable to get to it and deposit their eggs.

Animals with sores or open wounds should be cared for and the wound so treated that flies will not be tempted to oviposit on the sores.

THE CHEESE SKIPPER

Piophilæ casei

The adult of the cheese-skipper is a small, slender, black fly which occurs frequently about houses, cheese factories, packing houses, and grocery stores.

The cheese-skipper attacks meat as well as cheese. It seems to prefer pork to beef. It seldom occurs in salt-pork but is troublesome in smoke-cured meats. Fresh meat does not seem to be attractive to this species but the flies have been bred from the dead bodies of animals and from excrement.

The tiny, adult, winged flies are active creatures that never miss an opportunity to deposit their minute eggs on any suitable substance.

The eggs are laid either singly or in clusters of a dozen or so. These hatch within forty-eight hours and the tiny maggots commence to feed. Where the food supply is rich they do not wander far. When ready to pupate they come to the surface and pupate in the wrappings of the cheese or meat, or they may even migrate to cracks and crevices about the room.

The larvae are slender, white maggots measuring about one-third of an inch in length when full grown and cylindrical in form. The anterior end is pointed and the posterior end is truncate. The maggot is without feet, and, when it desires to travel, it brings its head and tail together so that when it straightens out with a snap it throws itself often to a distance of four or five inches from the starting point. It is this peculiar method of locomotion that has earned the creature the name "skipper."

There are probably about three annual generations in the North. During warm weather, three weeks time is required to complete its life-cycle.

The flies seem to select the richest cheese in which to deposit their eggs, and for this reason the presence of "skippers" serves almost as a guarantee of the excellence of the cheese. This is undoubtedly true though it is now known that the presence of the maggots, in itself, does not improve the quality of the cheese. Grocers tell us that even now skipper cheese is sought after and prized by certain customers who have acquired a taste for the combination.

It is fortunate that putrefaction does not follow an infestation of this species. The infested portion of either the meat or cheese may be cut out and the remaining portion is as good for food as before it was infested.

The fly, owing to its inquisitive habits and to the fact that it occasionally breeds in filth, is far from a desirable tenant in quarters where food for human consumption is stored.

Control:

Wire screens, twenty-four meshes to the inch exclude the winged flies. Store-rooms or pantries screened with wire of this mesh are safe from the skipper.

Where pantries or store-rooms have been infested, they should be fumigated with sulphur and the walls and woodwork carefully washed down with strong soap-suds or with lye-water.

Cheeses properly wrapped, greased, or waxed and stored in a dark place are practically safe especially where they are turned every day

FRUIT FLIES

Drosophila sp.

Of the many species of the fruit flies all resemble one another so closely in both habit and appearance, that it is difficult to distinguish one species from another. They multiply rapidly and during the canning season, usually appear suddenly in swarms. Only eleven days are required to produce a generation under favorable conditions.

The adults are small creatures measuring about one-eighth of an inch in length. Their conspicuous bright-red eyes and delicate, oversized wings are distinguishing characteristics. See cover for enlarged photograph of fruit-flies.

The adult deposits her tiny eggs in the pulp of over ripe fruit, garbage, pomace from cider-presses, vinegar barrels, or even cooked fruit.

The eggs hatch within a few days, and the slender thread-like maggots feed for several days before they transform to tiny brown pupae. Pupation takes place on the fruit, or on the sides of the container; the larvae do not enter the ground to pupate.

The flies are objectionable, not so much because of the damage they really do, but rather because of the enormous numbers which at times fairly take possession of an establishment. So small are they that they can pass with ease through ordinary screens. They are especially troublesome in late summer and early fall in places where over ripe fruit collects, and about cider-presses. They enter houses during the canning season, and at times become quite troublesome, often collecting on cooked fruit. Preserves, sweet-pickles, and jams attract them. Even ordinary canned fruit left exposed for even a day or two becomes alive with maggots. Fortunately the infestation is confined to the top portion of the exposed fruit and if one carefully removes the top layer the remaining contents of the jar is safe for use.

The adult sometimes deposits a ring of eggs about the lid of a fruit jar that has been sealed while hot. Larvae from such eggs usually perish because they are unable to get in, but if they do succeed in getting past the seal, the fruit is sure to spoil. Eggs are also often found about the spigot and the bung-holes of vinegar and cider barrels, and the larvae, on hatching, experience little difficulty in entering the barrels.

They occasionally become troublesome in orchards and vineyards at packing time and do much to hasten the decay of ripe fruit.

Control:

Do not keep rotting or overripe fruit in or about the house.

Jams and pickles and such canned fruits as are used from time to

time and kept only loosely covered should be protected either by setting them in an ice-box or in a receptacle which can be closed so tightly that no fruit-flies can get in. Fruit canned while hot and hermetically sealed, either with rubber-rings or with paraffin is safe from this pest so long as it remains closed.

After a local infestation becomes severe, frost provides the only real relief.

Proper disposal of fruit waste will do much toward holding this insect in check.