



# kunafin

## Biological Fly Control

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### THE FLY PROBLEM:

World health officials have often characterized the common house fly as the most dangerous insect on Earth! By breeding in the filth and refuse of animals and humans, the fly transmits many dangerous viruses and other disease causing bacteria. In addition to spreading disease, the fly is a nuisance. Many species are capable of inflicting painful bites on animals and humans. As most cattle feeders already know, this has a proven detrimental effect on weight gain and feed efficiency. In one controlled test, the level of stable flies per animal was regulated at approximately 50 per calf - about the normal level in most feedlots. These calves showed an average reduction of .2 pounds weight gain per day, and 13% decreased feed efficiency, as compared to the control group (fly free). When the number of flies was doubled to 100, the gain was reduced by .48 pounds per calf per day and feed efficiency dropped another 11%. As you can see, controlling the number of flies in the feedlot has a direct pay-off. In addition, pinkeye, and other fly-transmitted ailments are reduced, which result in lower veterinary bills and mortality rates.

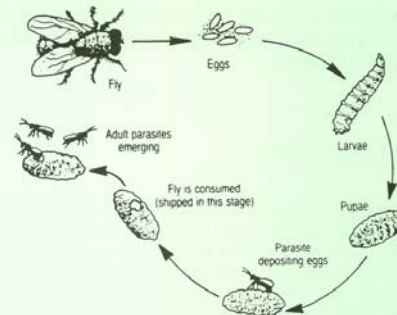
Fly control is not just an agricultural problem. It is also a problem for city governments in land fill areas and sewage treatment plants. Our program of biological integrated fly control can be just as effective in these situations as it is for the farmer, breeder, or feedlot owner. In the following discussion you will see how the program works and how it will save you money over conventional methods.

### BIOLOGICAL CONTROL:

Nature has always maintained a balance among its species' populations by means of natural enemies, distribution of food supplies, natural disaster, etc. Imbalances are generally temporary unless natural mechanisms are interrupted by the activities of man. By artificially congregating large numbers of animals in one area, or by planting too many acres of a particular crop, we allow the build-up of inordinate numbers of pest insects that thrive in these conditions. Further tampering by the indiscriminant use of pesticides only adds to the problem by eliminating, or reducing the build-up of natural enemy populations, while pest insects develop resistance to the chemicals. What we in the Integrated Pest Management field try to do is simply take advantage of nature's own predators and parasites, and combine their use with the **SELECTIVE** use of pesticides and other proven cultural practices. This is the **ONLY** way effective pest insect control can be maintained over the **LONG-TERM!**

### THE BIOLOGY OF FLY CONTROL:

As Dr. Fred Legner of the University of California, Riverside, pointed out in a 1964 article, 98% natural control of the housefly already exists. If it did not, and just one pair of flies were to start breeding in the Spring, by the end of five months the world would be 47 feet deep with flies! As you can see, flies are one of nature's most prolific breeders. An adult fly can lay as many as 2,400 eggs during her lifetime and these eggs hatch within 7 to 10 days! This means that even if you are able to kill the adult with chemical sprays the eggs left behind will continue to develop and the vicious cycle repeats itself (thus, comes resistance). The only way to get effective control is to interrupt the breeding cycle and destroy the fly before it can emerge as an adult (see diagram). Predators and parasites which are specific to the fly species are able to do this to a large extent unless infestations get out of hand.



It is then that the parasites, for example, cannot keep up with the number of flies due to their own limited reproductive capabilities. The average parasite lays from 6 to 350 eggs per day and these eggs can take as long as two to three weeks to mature, depending on the species and temperature. It is for this reason that we must supplement their numbers by adding insectary-reared parasites if we want to eliminate a significant number of pest flies from the environment. Keep in mind that since the parasites attack only the pupae, the adult flies already in the environment will not be affected. As a result, you will not see an immediate elimination of flies from your environment after introducing the parasites. It can take anywhere from 30 days to a year or more to attain the desired control levels, depending on a number of factors. These factors include: the number of flies present to start with; untreated breeding areas within migrating distance of your location; weather conditions; past history; and supplemental efforts used in conjunction with parasite releasing (ie clean-up, insecticide use, etc.).

#### ABOUT THE PARASITE:

There are several major species of fly parasites which are produced commercially by Kunafin (see brochure). Each has its unique characteristics and special uses. Since breeding conditions will vary from one location to the next, you will be sent the species which best suit your unique situation. Kunafin is collecting native populations each year throughout the U.S. to upgrade insectary stock.

These species attack the most common species of flies which breed in animal and vegetable waste. The parasites do not bother humans or animals in any way. Due to their minute size and life cycle, fly parasites are more susceptible to insecticides than flies, so any supplemental spraying must be done carefully, and sparingly. Once a parasite egg is deposited in a fly pupae, the parasite kills the fly, and consumes the body as it develops into adulthood. An adult parasite emerges from the pupae, and it immediately starts breeding. Once the existing fly population is eliminated or severely reduced, the number of parasites will also decline since they no longer have hosts on which to live. This is why it is important to continue periodic releases of parasites even after the fly population is under control. Fly migration from other areas will rapidly cause another build-up if there are not enough parasites on hand to take care of the situation.

#### YOUR PROGRAM:

The time to start your Biological Fly Integrated Control Program will vary according to your location, but generally speaking, we recommend starting the parasite releases as soon as the first generation of over-wintered flies begin to appear (if there's one, you know there will soon be more!). This means early Spring in most areas of the Continental United States. The earlier you start your program, the better! As mentioned earlier, actual numbers of parasites necessary for good control will vary according to many factors.

In practice, it is better to start off a little high, and then slowly reduce the numbers as control is attained. You can never have too many, but you can have too few!

The effectiveness and cost savings of your Biological Integrated Insect Control Program vs. other programs is not just conjecture. This program is in widespread use throughout the country and in other parts of the world. The U.S. Department of Agriculture has done numerous studies, and considerable field testing of our fly control methods, and have shown dramatic, positive results. Their studies have been done in poultry, feedlot, dairy, horse and many other agricultural operations. They have reached the same conclusion: IT WORKS!! AND IT SAVES MONEY OVER CONVENTIONAL METHODS!!!

#### ONE EXAMPLE:

Many programs have led to almost total elimination of fly populations in as little as 30 days! In 1977 one large cattle feedlot operation discontinued spraying, fogging and fly baiting and began releasing fly parasites. During this time they have maintained excellent control at half the price of their former chemical program. In addition to the fly parasite releases, they also employ other cultural methods which we recommend. They regularly clean their pens, and keep their operation as dry as possible. Also during extended periods of rain they sometimes use fly bait to help hold down fly outbreaks which could result from massive migration from other breeding areas. This experience has been repeated throughout the U.S. in feedlots, poultry, dairy, and horse operations. Since 1977 not only are these operators getting better control for their money, but they also avoid the potential adverse side effects associated with insecticide use. It's an investment for the future! The money they spend is growing there year after year! (Just like money in the bank!).

#### CONCLUSION:

Biological integrated insect control is scientifically proven and cost-effective. It eliminates the hazards associated with chemical insecticides and gives long-term, reliable control. We at Kunafin are experienced and committed to the concept of Integrated Pest Management, and can help you develop your own customized program. We remain your personal consultants throughout the season and are happy to answer any and all questions you might have. We will also be more than happy to provide you with references, price quotes and other material concerning this program at your request.