DEBUG TURBO
APPLICATION RECOMMENDATION FOR WALNUTS

General: DEBUG TURBO is a neem based (containing about 67% Neem Extract with Azadirachtin, and 20% Synergist) insecticide, repellant, anti-feedant and growth regulator. We recommend the use of DEBUG TURBO by itself with no additional pesticides unless the insects reach economically damaging levels, in which case organic pesticides may be used in conjunction with DEBUG TURBO. Apply even if there is no insect problem, as a preventative.
DEBUG TURBO is soft on beneficials and pests do not develop resistance to it.

Water pH should be around 5.5. Use buffers if necessary
It is recommend that the application be made late in the evening and early morning to be most effective.

For the Control of: **Codling Moths, Aphids, webworms, frosted scales, Navel Orangeworms, caterpillar, and Spider mites.**

APPLICATION RATES, DILUTION AND TIMINGS

(1) CODLING MOTH (Cydia pomonella)

The full grown larvae of the Codling moth over winters on the ground (canopy), or under loose scales of the barks. This over wintered generation starts its first flight during March. The moths lay the first generation eggs. The second flight results when these eggs mature. The eggs are laid on the leaves near the nuts. The eggs take between 4 to 6 weeks to mature. The larvae of these eggs bore into the nut lets through the blossom-end. Damaged nuts fall to the ground. The larvae pupate under the barks on the tree. Adults of this generation (first) emerge in end-May to end-June, but could emerge as late as late June in Coastal areas. The second generation moth larvae bore into the walnuts. These larvae develop into adults and begin to emerge late July to August. Try to differentiate between codling moth and navel orangeworm. Navel orangeworm frequently infests nuts that were previously infested with codling moth.

DAMAGE:

First generation larvae causes nut lets to drop from the tree thereby reducing yield of walnuts. Besides nuts that are attacked by the second and third generation larvae are not marketable even if they have not fallen to the ground, because of the feeding damage to the kernels. Also these damaged nuts serve as breeding sites for the navel orangeworm. Point of entry into the nuts could be where the two nuts touch or through the tissue at the end of the stem.

WHEN TO TREAT:

Assuming that the first bio fix point is March 15, and observing a particular group of trees for nut fall and this fall is over 3% of the total nuts in the tree (visual check), the **first treatment** of DEBUG TURBO should be around 300 degree days from first bio-fix. For example in the Gilroy area, based on the weather

station reporting statistics, 300 degree days are supposed to occur around April 26 in the year 2003. The **second treatment** would be when the degree days reach 700 (around May 26, 2003 in the Gilroy area), and the **third treatment** when the degree days reach 1060 (around June 17, 2003 in the Gilroy area).

TREATMENT:

Botanical treatments are ideal. DEBUG TURBO is preferred to other botanicals, as the moths cannot develop resistance to DEBUG TURBO.

For the **first treatment** - spray DEBUG TURBO at the rate of 1-1/2 to 3 quarts per 100-150 gallons of water **per acre** using high pressure equipment. In applying DEBUG TURBO spray, all leaves, twigs, and nuts should be covered. Hydraulic machines are designed to use large volumes of water to carry the chemicals to the trees. Sprays should be applied until water runs off leaves in the upper portion of the tree. Do not attempt to concentrate or use low volume sprays with hydraulic equipment.

Air blast and mist blowers are designed for low volume applications. Air blast equipment should be adjusted before the spray season begins to deliver the desired volume of spray in the proper pattern as is dictated by tree size. Consult instruction manuals or spray machine representative for advice on correct placement of spray nozzles. Remember, when spraying with air blast sprayers, the Neem active ingredient is carried to the tree in a small volume of water, which is diluted, by a larger volume of air. Too fast a rate of travel will result in insufficient coverage, where the trees are not filled with spray-laden air resulting in poor coverage.

For the **second treatment** – spray DEBUG TURBO at the rate of 1-1/2 to 3 quarts per 100-150 gallons of water **per acre**. Follow the instructions given above for the first treatment.

For the **third treatment**- spray DEBUG TURBO at the rate of 1 to 2 quarts per 100 – 150 gallons of water **per acre**. Follow the instruction given above for the first treatment.

Subsequent treatments may not be needed due to the timing of the three treatments above.

(2) APHIDS, MITES, WEBWORM, FROSTED SCALE, NAVEL ORANGEWORM, CATERPILLAR, AND SPIDERMITES

Aphids would probably appear in May. Red mites are not generally a problem unless they have high populations. Webworms can be taken care of on individualized tress. Frosted scale is a problem only if more than 5 nymphs are present per foot of wood. Navel Orangeworm problem may be taken care of with orchard sanitation as well as Codling Moth treatments. Insecticide treatments for other infestations would probably keep the caterpillar populations in check. Spider mites are a problem between June and early July. They colonize on the lower branches of the inner canopies. If there are brown clusters of leaves in 10% of trees and no sign of any predators or if there is danger of leaf drop and exposure of nuts to sunburn, then a treatment becomes necessary.

TREATMENT:

Botanical treatments are ideal. DEBUG TURBO is preferred to other botanicals, as the insects cannot develop resistance to DEBUG TURBO.

Spray DEBUG TURBO at the rate of 1-1/2 to 3 quarts per 100-150 gallons of water **per acre** using high pressure equipment. In applying DEBUG TURBO spray, all leaves, twigs, and nuts should be covered. DEBUG TURBO is a contact insecticide and total coverage is very important.