AgNOVA TECHNOLOGIES

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FRUITION® NATFLAV® 500

Natflav contains 420 g/L protein material

Fruition® Natflav® 500

Fruition Natflav 500 is a premium quality autolysed yeast bait, specifically designed to attract and kill immature male and female fruit flies when used in a baiting mixture with an insecticide approved for this use.

Fruition Natflav 500 (Natflav) was developed in Australia more than 20 years ago, and is considered the premium protein bait for use in fruit fly management programs. The recommended use rate for Natflav is 0.5–6 L/100 L in a volume of 15–20 L of spray mixture per hectare. Rates of 4–5 L/100 L provide optimal levels of attraction and hence, population reduction.

Higher rates of protein are more attractive to immature fruit flies of both sexes. Natflav outperforms other commercially available protein baits when applied according to the label.

Trial work conducted in the field by AgNova has clearly shown that the use of gelatinised water (by adding xanthan gum) with Natflav significantly increases initial fruit fly mortality and extends the residual activity of Natflav. The return on investment from using gelatinised water with Natflav has been proven, however where growers choose not to do this, Natflav will still perform as well as or better than competitor products at the same rate.

TREATMENT	% MORTALITY		
	2 hours	3 days	6 days
0.005% INSECTICIDE A + 5% NATFLAV 500	37	21	18
0.005% INSECTICIDE A + 5% NATFLAV + 0.5% XANTHAN	95	88	92
0.005% INSECTICIDE B + 5% NATFLAV	39	6	4
0.005% INSECTICIDE B + 5% NATFLAV + 0.5% XANTHAN	98	94	89

Why use Protein Bait?

Protein is a very important component in the diet of fruit flies. After young flies emerge from the soil, they seek out and feed on protein on leaf and fruit surfaces, especially in fruiting host plants. Female fruit flies in particular depend on protein for growth to sexual maturity and for the development of eggs. Consequently, when protein baits are sprayed onto fruiting host plants in a baiting mixture with an insecticide approved for this use, populations can be controlled before females reach the egg-laying stage.

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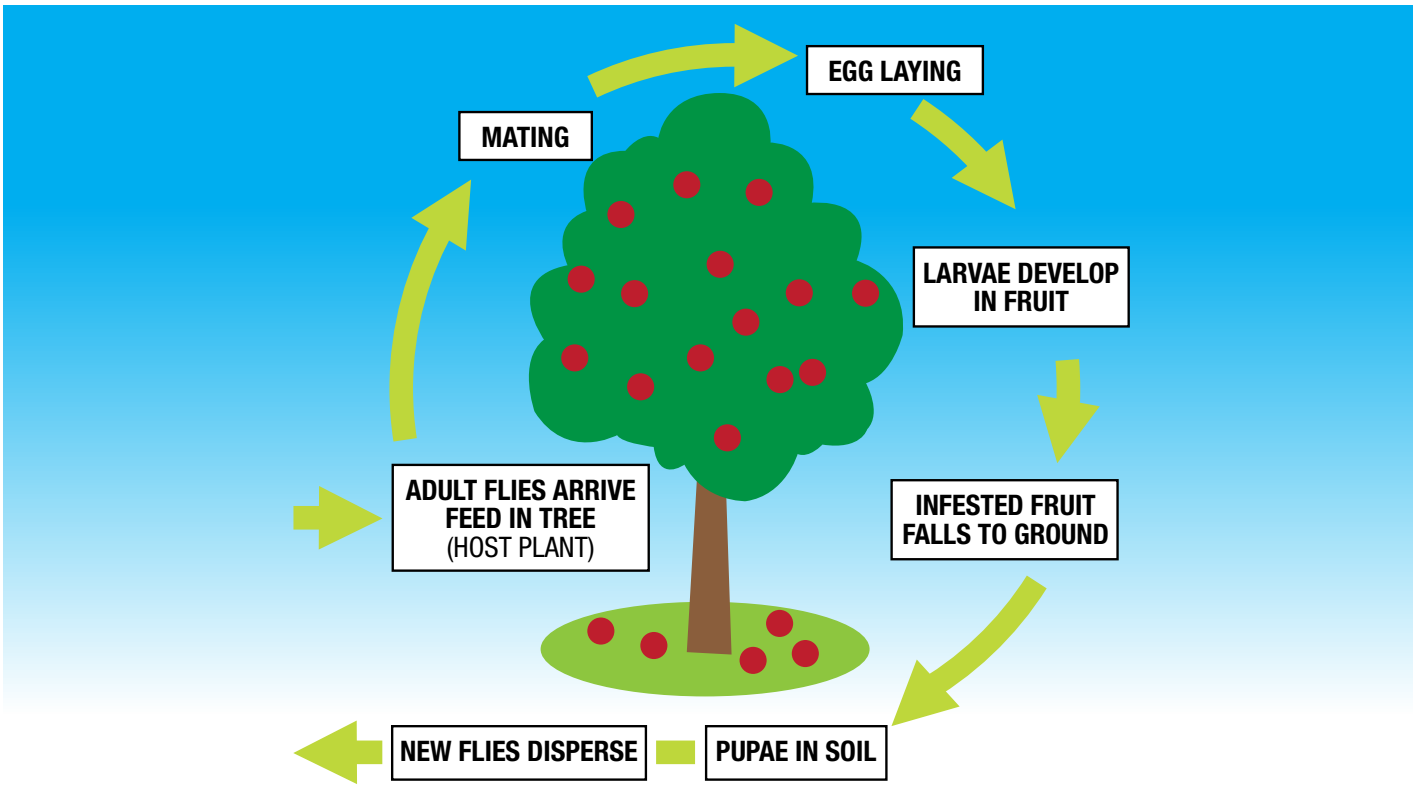
What is an Autolysed Yeast Bait?

There are two main types of protein bait sprays used in fruit fly control, namely acid hydrolysates (yeast hydrolysates) and yeast autolysates. Acid hydrolysates generally have a high salt content as a result of their production process and have been largely replaced by yeast autolysate-based baits.

Yeast autolysate baits such as Natflav are produced by heating then cooling live yeast solutions. This causes the digestion of proteins in the yeast by enzymes which are also contained in the yeast, giving a product which is significantly lower in salt than acid hydrolysates.

How and When to Apply Natflav

- When Natflav + insecticide baiting mixture is applied to the crop foliage, it is ingested by immature male and female fruit flies and kills them. Because the bait spray attracts fruit flies over distances of 5–10 metres, overall coverage of the tree canopy is unnecessary and band or spot spraying has, over many years, proven to be very successful;
- Commence applications of the baiting mixture according to the rates and application timings specified in the DIRECTIONS FOR USE table on the label or in the relevant permit for the insecticide being used, or earlier if fruit flies are detected in Fruition Nova® traps;
- In all situations, begin protein bait spraying early, before fruit becomes susceptible to fruit fly infestation, and complement protein bait spraying with use of Fruition Nova Traps to allow monitoring of fruit fly population dynamics. If numbers of mature egg-laying female fruit flies continue to increase following implementation of a program of Natflav protein bait sprays and Fruition Nova Traps, cover spraying of an approved insecticide may be required;
- Reapply according to the DIRECTIONS FOR USE table on the label or in the relevant permit for the insecticide being used;
- Reapply the baiting mixture following rainfall;
- Avoid application of the baiting mixture to fruit or other edible commodities. Protein baits may cause phytotoxicity, including a red discoloration of the fruit. Always adhere to the instructions in the DIRECTIONS FOR USE table on the label or in the relevant permit for the insecticide being used;
- Adhere to the withholding period on the insecticide label or in the relevant permit for the insecticide being used.



General life cycle of fruit flies

Integrated Pest Management (IPM) Tools for Fruit Fly Control

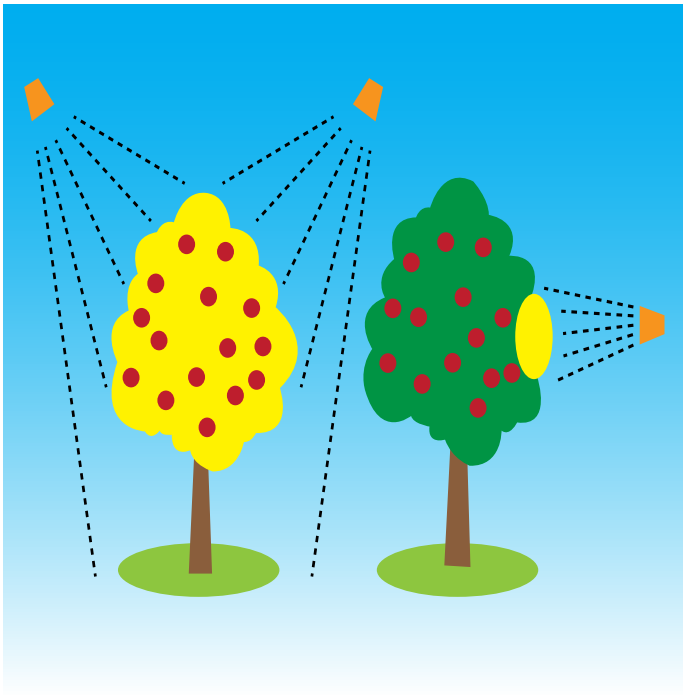
There are 5 tools to effective IPM of fruit flies, namely planning, hygiene, monitoring/trapping, protein bait spraying, and, where possible, cover sprays.

1. **Planning** is required prior to the season, taking into account what happened last season: what worked, what didn't, and what needs to be done this season. A plan should be developed to make it clear, well in advance, what strategies will be implemented, and when, to ensure good control of fruit flies. Among the decisions to be taken are: which traps to use, when to start trapping, when to begin protein bait sprays, what insecticide to use in bait sprays, what cover spray options are available, and when to start cover sprays.
2. **Hygiene** is a year-round activity, making sure that steps are taken to interrupt the fruit fly breeding cycle at all stages. Reducing carryover fruit on trees or infestations in alternative hosts close by, mulching or removing windfall fruit from the ground to prevent larvae moving from fruit to soil to pupate, cultivating the soil to interrupt pupation, etc.
3. **Monitoring and trapping** are essential to any IPM program for fruit fly control. Monitoring provides critical information about what is happening with fruit fly populations in the crop. Fruition Nova Traps are the only traps on the market which specifically monitor population development of mature female fruit flies – these are the fruit flies which are ready to lay eggs and which cause economic damage to crops. Other trapping systems monitor male fruit flies or immature males and females – these numbers are used as a proxy to estimate what is happening with mature female fruit fly populations, but they are not always accurate because populations of mature females are not necessarily in the crop at the same time as immature males and females. Also mature females can enter the crop from some distances away, without immature males and females being present in the crop, having been fertilised elsewhere.

   Fruition Nova Traps have been developed over several years by AgNova for monitoring and trapping fruit flies as part of an overall IPM program. They attract mature female fruit flies due to the colour and shape of the trap, and because of the odour of the lure, which has been specifically developed to attract mainly mature female fruit flies. It is important to start monitoring early in the life of the crop, especially if there are other mature or maturing crops or alternative host plants in the vicinity which might act as sources of infestation. For more information on Fruition Nova Traps, please refer to the product label.
4. **Protein bait spraying** has become much more important in the last few years because of restrictions placed on the use of cover sprays for fruit fly control. Natflav attracts immature male and immature female fruit flies when used in a baiting mixture with an insecticide approved for this use. Protein bait sprays are generally applied to the mid-lower part of the canopy of tree crops.

   In vegetable crops, sprays are applied to vegetation in the perimeter around the crop as it is not feasible to apply directly to the crop.

   Application of bait sprays should start when young flies begin to emerge, and should be applied at 5–7 day intervals according to the label of the insecticide used, sooner if rain falls after application. The mixture should be applied using a coarse band spray, avoiding direct application to edible commodities such as fruit or vegetables, or as spot sprays according to the recommendations on the label of the insecticide being used.
5. **Cover sprays** have traditionally given very good control of fruit flies. However, in recent years, the range of products available for use as cover sprays has been restricted, and the main management/control effort is now focused on protein bait spraying and trapping.



Difference in spray patterns when applying cover sprays (on the left) vs bait sprays (on the right) where bait sprays are directed to the trunks or foliage of trees as a band or spot spray. (Diagram courtesy of Robyn Barnes, Beaudesert, Qld.).

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Directions for Use Table

Use in combination with an insecticide approved for this use as part of an IPM program for control of fruit flies.

SITUATION	PEST	RATE	CRITICAL COMMENTS
Crops susceptible to fruit fly attack	For example: Queensland fruit fly (*Bactrocera tryoni*), Lesser Queensland fruit fly (*Bactrocera neohumeralis*), Jarvis' fruit fly (*Bactrocera jarvisi*), Cucumber fly (*Bactrocera cucumis*)	Fruition Natflav 500: 0.5–6 L/100 L water or gelatinised water, PLUS Recommended rate of approved insecticide.	The following recommendations are provided as a general guide. Always adhere to the approved insecticide label for specific directions for use. Yeast autolysate protein products can cause crop phytotoxicity. Always adhere to the approved insecticide label directions to reduce the risk of crop phytotoxicity. Follow the withholding period provided on the label of the insecticide being used. Higher use rates of Fruition Natflav 500 will increase bait attractiveness and efficacy. SPOT APPLICATION: Apply to trees, vines and foliage as coarse spots of 40–50 mL per spot. Apply 150 spots per hectare. For optimal control of fruit flies, Fruition Natflav 500 *plus* insecticide bait applications should commence well before the fruit becomes attractive to mature egg-laying female fruit flies i.e., from the early stages of fruit set, when fruit is still hard and green (at least 6 weeks prior to expected harvest date). Continue applications for two weeks after harvest. Application of Fruition Natflav 500 in gelatinised water provides maximum efficacy and increased bait resistance to weathering. Repeat applications every 5–7 days. Shorter application intervals will be necessary during warm wet weather. Use the longer spray interval when spraying during colder weather when fruit flies are less active. Rainfall will wash the baiting mixture off the crop. If rain occurs after application re-apply as soon as possible after the rain event. Avoid application of the baiting mixture to fruit or other edible commodities.
Citrus – additional instructions			Critical comments as above for crops susceptible to fruit fly attack. Apply as above OR at 15–20 L/ha total volume as a 30 cm band at skirt level of trees for area wide control. Some varieties of citrus may be susceptible to fruit damage from the spray. As repeat applications of protein bait sprays to the same part of the tree may cause some phytotoxicity, it is recommended that alternate sides of the trees are sprayed each week.
Vegetables and berry crops			Critical comments as above for crops susceptible to fruit fly attack. Do not apply directly to crop. Spray perimeter vegetation around the outside of the crop. Where Queensland fruit fly is specifically being targeted apply the spray at a height of 1.5–2 m onto the perimeter vegetation; where cucumber fly is being targeted, apply the spray at a height of 0.5–1 m onto the perimeter vegetation.
Crops susceptible to fruit fly attack	Mediterranean fruit fly (*Ceratitis capitata*)		The following recommendations are provided as a general guide. Always adhere to the approved insecticide label for specific directions for use. Yeast autolysate protein products can cause crop phytotoxicity. Always adhere to the approved insecticide label directions to reduce the risk of crop phytotoxicity. Follow the withholding period provided on the label of the insecticide being used. Higher use rates of Fruition Natflav 500 will increase bait attractiveness and efficacy. Commence weekly bait spraying when fruit is half size. Where Mediterranean fruit fly pressure is expected to be high, begin bait spraying at fruit set. SPOT APPLICATION: Apply 50–100 mL of bait mixture in coarse droplets (4–6 mm in size) to foliage. Apply to every tree in a row; alternate the sides treated at each application. BAND SPRAY: Apply as a band spray to each tree in a row or, with a spray rig set up to spray both sides of a row, travel up and down every second row so that trees are not being double sprayed. It is recommended to continue bait spray applications for at least 4 weeks after harvest to ensure that flies emerging from the soil are controlled. Continue treating any citrus trees while fruit remains on other trees as citrus are favoured resting places for Mediterranean fruit fly. Bait spraying in Autumn is recommended as Mediterranean fruit flies present at this time are the source of infestation in the following spring.

Preparation

If using gelatinised water, this needs to be prepared on the day prior to spraying the baiting mixture. To do this, add Fruition Xanthan Gum powder to water at a rate of 5 g/L and agitate thoroughly. On the day of application, mix the gelatinised water thoroughly until a uniform consistency is achieved.

On the day of application, prepare the baiting mixture by adding Natflav at a rate of 0.5–6 L/100 L of water or gelatinised water, in combination with HY-MAL* INSECTICIDE or an alternative insecticide approved for this use according to the DIRECTIONS FOR USE table on the insecticide label.

Agitation should be maintained throughout the mixing process and until application is completed. Only prepare enough baiting mixture for use on the day of application.

Fruition Nova Traps and Natflav

Natflav should be used in conjunction with Fruition Nova Traps as part of an IPM control program. Fruition Nova Traps can be used for both population monitoring and as part of an IPM control program when susceptible crops are fruiting.

For more information scan the QR code or contact your local Area Sales Manager

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