

## Ecological Infrastructures (EI), aka Ecological Compensation Areas (ECA)

Ecological infrastructures (EI) are areas on the farm that are dedicated to rich and diverse flora with the purpose of promoting landscape-level continuity and functional biological control for common agricultural pests via beneficial insects. While LIVE and Salmon-Safe both require a minimum of 5% of the entire farm surface to be used for this purpose, this number should only be seen as a starting point for planning purposes. This standard is derived from the work of researchers in the field of integrated production and is a common cornerstone of these types of programs.<sup>1</sup> In the past, LIVE has used the phrase ‘set-aside’ which has caused some confusion. *Set-aside* should be seen as synonymous with *dedicated* or *permanent*, and should not be misconstrued as a requirement for one contiguous parcel of wild or unmanaged land. In-farm functional biodiversity should be seen as the ideal. Although measuring and quantifying numerous smaller biodiversity ‘islands’ may be somewhat more difficult than one larger parcel, this management practice will have the most beneficial impact to offset the negative ecological impacts of agricultural practices on the land.

The standard, as written by LIVE is as follows:

“All ecological infrastructures/compensation areas are documented and acreages are defined on a farm map. Each ecological infrastructure is described, shown with dimensions, and has been calculated to total at least 5% of the entire farm property acreage (excluding buildings and managed timberland). Ecological infrastructures (also called ecological compensation area or bio-compensation zones) are areas of the farm that are either left wild or managed for the express purpose of promoting biodiversity, wildlife corridors, and/or habitat for beneficials.”

LIVE and Salmon-Safe accept numerous options to meet this standard. They include but are not limited to the following:

IN THE VINEYARD	
Type of EI/ECA	Management Restrictions
Low intensity grassland	No fertilizer or pesticides except spot treatment of problem weeds with LIVE-approved herbicide. High mowing once per year allowed.
Wetlands	No fertilizers or pesticides. High mowing once per year to once per three years allowed.
Conservation headland	No fertilizer or pesticides except spot treatment of problem weeds with LIVE-approved herbicide. No mowing allowed.
Wildflower strips	No fertilizer, pesticides, or mowing
Rotational fallows	No fertilizer, pesticides, or mowing
Hedges and Woodland patches (not managed for timber)	May be trimmed every 2-3 years (low hedges) every 5-10 years (tall hedges/trees) or thinned (woodland patches). Grass strips of at least 3m

<sup>1</sup> The optimal total surface of natural areas to maintain an adequate diversity of species is estimated to be close to 15%. A minimum surface of 5% of farmland is required by IOBC to be designated as ECA. This size is therefore a step in the right direction but not necessarily the final objective. *Boller, Hani & Poeling, Ecological Infrastructures. 2004*



## Ecological Infrastructures (EI), aka Ecological Compensation Areas (ECA)

	wide that transition from hedge to cropped area receives no fertilizer or pesticides, and may be mowed once per year, high and late, if at all. <u>Grass strips cannot be double counted as buffer area and ECA.</u>
Non-agricultural high-stem fruit trees/orchard	No fertilizer or pesticides. Old trees with dead branches and cavities are left alone. Minimum 30 trees, ideally 300+ trees. May be pruned periodically (every 2-5 years)
Low intensity pasture or pasture land in forests	No fertilizer or pesticides
Ditches and ponds	Ponds are not used for irrigation
Stone heaps, embankments and stone walls	
Unpaved farm trails	No fertilizer or pesticides
Wildlife corridors	No fertilizer or pesticides
<b>ON THE FRUIT FARM</b>	
Type of EI/ECA	Management Restrictions
Botanically rich alleyways	Alternate mowing regime allowed
Intertree-strips with cover plants	No residual herbicides allowed
Wildflower strips	No fertilizer or pesticides. Ideally 10% + of orchard surface. Superficial hoeing allowed to reduce competitive grasses and to enhance annual broadleaf plants.
Low intensity grassland	No fertilizer or pesticides. Maximum of 2 cuts per year, the first occurring after plants bloomed and seeded.
Pioneer plants in wild areas	No fertilizer or pesticides. May be high-mowed every 2-3 years. Stone heaps should be piled up periodically and growing shrubs removed.
Hedges and woodland patches	See vineyard section
Single trees and non-agricultural high stem orchards with meadows	See vineyard section

### Cover crop as EI/ECA

It is frequently asked if cover crop can be used as EI. The answer to this depends on how it is managed. **Permanently flowering green cover** may be used. Alternate mowing at long intervals is permitted to manage competition with crop. However tilling under is not allowed for this area to qualify for EI. Spading every other row every fourth year is permitted – this will result in four distinct age groups of flora within the EI, thus maximizing its ecological quality.



## Ecological Infrastructures (EI), aka Ecological Compensation Areas (ECA)

### Mowing heights and mower types

Mulching mowers cause the most damage to beneficial fauna and should not be used in EI. Traditional horizontal mowers are relatively harmless. If bee activity is expected, mowing before 7am or after 6pm will mitigate damages to their populations.

Fauna can escape if mower is set to higher than 4-5 inches. Alternate mowing/leaving patterns of wildflower patches is necessary to maintain food sources for beneficial fauna.

### Distances

Crawling, flying, or windborne beneficial insects have a limited operational distance 30-150ft. Although as of yet unproven, there is a hypothesis that planting pollen and nectar sources such as open faced roses as 'stepping stones' between EI may help these insects to extend their predation range.

### Buffer zones and pesticide drift

To reduce drift, please observe the following recommendations:

- No pesticide application if wind speed exceeds 10mph.
- If possible no application if temperature exceeds 77°F and relative humidity is below 50% (ideally <70%)
- Avoid droplet sizes that are too small
- Nozzles as close to target as possible
- Near EI: Do not treat the field edge or sensitive off-crop areas (minimum distance of 10ft) and if possible reduce delivery pressure and sprayer speed

### Stinging nettle

Stinging nettle, while commonly seen as a weed/nuisance, can host more than 100 insect species, including many beneficials. Butterfly and aphid species are attracted to nettle, as are the egg parasitoids of grape leafhopper. Colonization of nettle patches by beneficials occurs extremely rapidly (within 3 years).

