

ICEAAX AminoA[®]



**FROST PROTECTANT FOR
FLOWERING SOFT, TOP FRUIT AND VINES**

**Natural frost protection
in flowering fruit crops**



www.aminoa.co.uk

Importance of frost protection in soft and top fruit

AminoA ICEAAX is a natural plant bio-stimulant helping to minimise or eliminate crop damage caused by late frosts, by stimulating the production of natural plant Anti-Freeze Protein (AFP) in flowering fruit crops.

AminoA ICEAAX was developed out of specific demand from a grower who had seen their apple and pear orchards wiped out by frost. Losses can be catastrophic in flowering crops such as apples and pears.

While frost injury rarely causes complete crop loss in soft fruit such as strawberries, flower buds are particularly susceptible to frost injury any time after bud break. Flowering vines are also vulnerable to frost damage. By applying at flowering, immediately before a frost event, **AminoA ICEAAX** lowers the freezing point of the cell cytoplasm, enabling the crop to resist the late frost.

Typical Analysis	
Composition w/w	%
Total free amino acids	7%
Total amino acids	29%
Total Organic Matter (OM)	31.95%
Humic Acids OM	16.36%
Fulvic Acids OM	6.43%
Total Humic Extract (HE)	22.79%
Total Nitrogen (N)	4.9%
Organic Nitrogen	4.7%
Ammonia Nitrogen	0.2%
Potassium	6470 mg/kg
Phosphorus	1170 mg/kg
Calcium (CaO)	4200 mg/kg
Magnesium (MgO)	786 mg/kg
Iron (Fe)	750 ppm
pH	8.5-9.5

AminoA ICEAAX: preventing frost damage in flowering fruit crops

- **Cryoprotectant properties:** **AminoA ICEAAX** contains compounds that act as cryoprotectants, reducing ice crystal formation and minimising damage caused by freezing temperatures
- **Antifreeze proteins:** **AminoA ICEAAX** contains antifreeze proteins or compounds that mimic their action, lowering the freezing point of water and inhibiting ice crystal growth
- **Hormonal regulation:** **AminoA ICEAAX** contains substances that regulate plant hormones involved in stress responses, helping plants maintain physiological functions and enhance their ability to withstand frost stress
- **Protein synthesis:** **AminoA ICEAAX** promotes protein synthesis in plants, aiding in the repair and regeneration of damaged tissues
- **Antioxidant activity:** **AminoA ICEAAX** contains antioxidants or compounds that stimulate antioxidant activity in plants, protecting cells from oxidative damage caused by frost stress
- **Osmotic regulation:** **AminoA ICEAAX** helps regulate osmotic balance in plant cells, maintaining proper water balance and preventing excessive dehydration during frost stress

These mechanisms work together to protect flowering fruit crops from frost damage, allowing them to maintain their health and productivity even in cold temperatures.



Strawberries treated with **AminoA ICEAAX** 48 hours after -3.5°C frost event



Untreated strawberries in adjacent beds 48 hours after -3.5°C frost event

Grower experience

AminoA ICEAAX generally delivers frost protection in flowering soft fruit, top fruit and vines down to -3°C and has demonstrated protection down to -6°C . Results depend on duration of temperature drop and relative humidity.



Soft fruit

The award winning (Fruit Grower of the Year 2023) soft fruit team at AJ & CI Snell, Windmill Hill Fruits, Herefordshire grow strawberries, raspberries, blackcurrants, blackberries and blueberries. They have been using the range of **AminoA** products for at least the last eight seasons.

Farm manager Tom Deards explains, "We initially used **AminoA ICEAAX** at times of frost risk and sustained cold periods, but have since also introduced **AminoA FLO** from the range, helping with periods of heat stress under polytunnels.

"We use **AminoA FLO** in tank mixes with fungicides and foliar feeds, allowing for optimal time of application directly when needed."



Apples frosted 17 times over a 6 week period



Temperature sensor in the orchard registering -4.7°C

What our customers say...



Top fruit

Richard Robinson, a Bramley apple grower based in Northern Ireland, has been using **AminoA ICEAAX** for the last two seasons, during which time his crop has faced some relentless frosts.

*"We have applied **AminoA ICEAAX** both the day before the frosts came in, and also a few days later if the frost temperature started to get quite low again. I believe by doing so, **AminoA ICEAAX** has saved a higher percentage of our crop,"* he says.



Vineyards and wineries

Managing sites with various levels of frost risk across the UK, national vineyard and winery consultancy Vinescapes has been using **AminoA ICEAAX** on some of its higher risk sites over the last two years.

*"We have found **AminoA ICEAAX** has worked well as part of an integrated frost protection strategy,"* says Joel Jorgensen, Vinescapes' managing director for viticulture.

*"Without quantified results, we are confident that using **AminoA ICEAAX** has provided an extra layer of protection,"* he adds.

Application rate

Purpose	AminoA ICEAAX	Water l/ha	Dose rates l/ha
Frost protection	Apply 4 litres ha to flowering crops immediately before a frost event in daylight hours, whilst photosynthesis is taking place. Repeat after 7 days if frost risk persists.	Water l/ha 100-500 litres ha	4-5 l/ha
Nutrition	Apply 2-3 litres ha as required	Water l/ha 100-500 litres ha	2-3 l/ha

Environmental benefits



- Improves the efficiency of other agrochemicals and fertilisers potentially reducing the amount applied.
- Is beneficial to soil and plant micro-organisms.
- Safe for the environment and user.



AminoA ICEAAX is fully approved for use in Organic agriculture by OF&G please contact **www.aminoa.co.uk** for more information. **enquiries@aminoa.co.uk**



or call **01633 894300** to speak to our technical team, or call the UK office **+44 1633 894300**



AminoA Biostimulants Ltd

Nant yr Ochain, Michaelston-y-Fedw,
Cardiff UK CF3 6XT