



Insecticide Resistance Action Committee

# Insecticide Resistance Management Recommendations for Insect Pests of Cereals in Europe (EU 27)

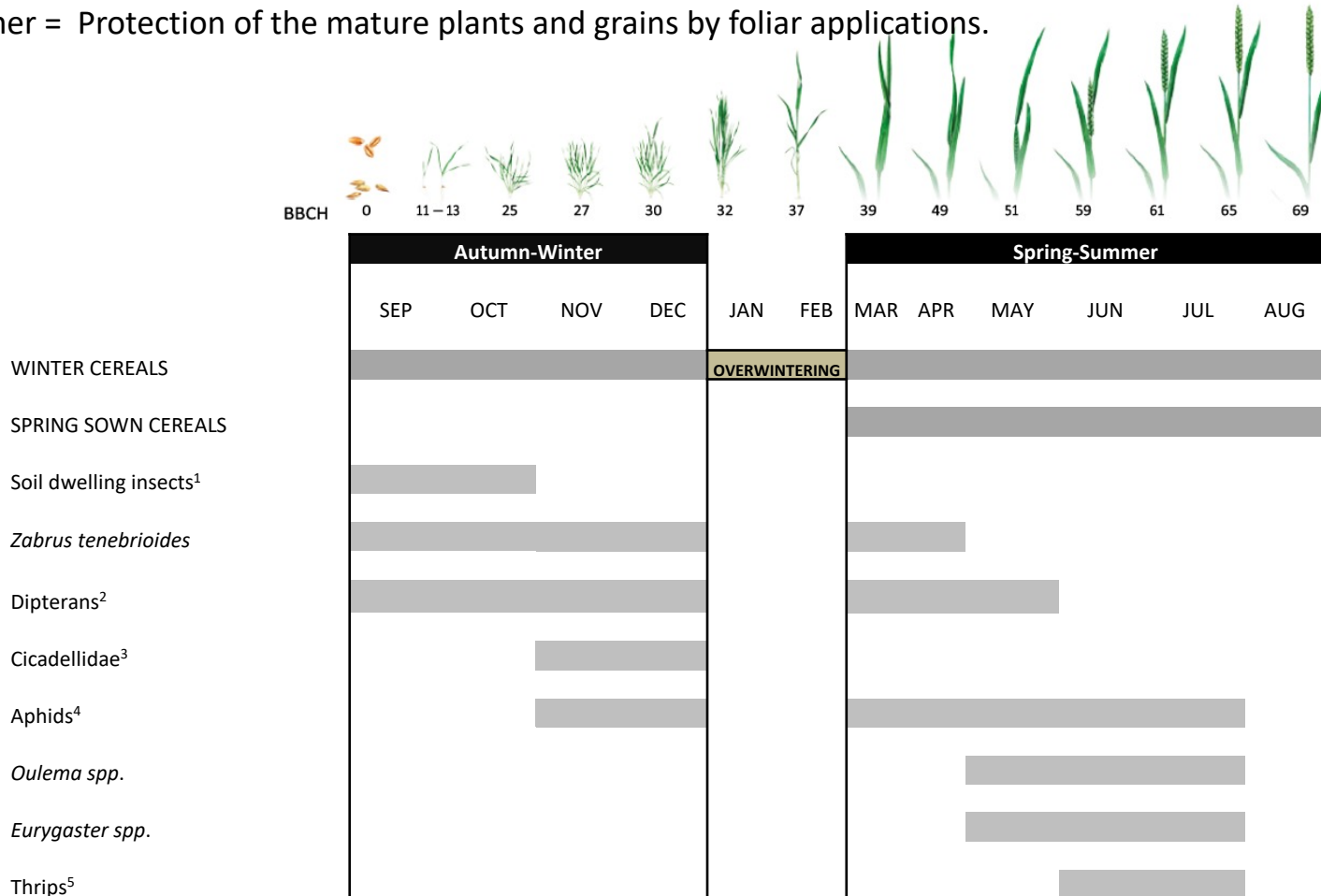


IRAC Sucking Pest Working Group

Two main periods when insect pests of cereals may require insecticide treatment:

Autumn-Winter = Protection of early growth stages of winter cereals by seed/soil treatments and later by foliar applications.

Spring-Summer = Protection of the mature plants and grains by foliar applications.



<sup>1</sup> mainly Scarabaeidae, Elateridae larvae (grubs, wireworms); <sup>2</sup>Several dipteran species including *Oscinella frit*, *Haplodiplosis marginata*, *Contarinia tritici*; *Sitodiplosis mosellana*, etc.; <sup>3</sup>targeted mainly *Psammotettix alienus* and *Pentastiridius leporinus*; <sup>4</sup>*Rhopalosiphum padi*, *Sitobion avenae* are targeted in autumn and spring, while *Metopolophium dirhodum* in spring only; Some countries need specific registrations for virus control: e.g. using products against aphids as virus vectors might not be claimed to control the virus infections; <sup>5</sup>mainly *Limothrips cerealium* and *L. denticornis*.



# Insecticide resistance management recommendations

## for insect pests of cereals in Europe (EU 27, no emergency exemptions considered)

Limited range of insecticide mode of actions available in Europe, with the risk of using same insecticides consecutively against the same pests = resistance risk.

	Autumn-Winter						Spring-Summer						
	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	
WINTER CEREALS					OVERWINTERING								
SPRING SOWN CEREALS													
Soil dwelling insects	█												
<i>Zabrus tenebrioides</i>	█						█						
Dipterans	█						█						
Cicadellidae			█										
Aphids			█				█						
<i>Oulema spp.</i>								█			█		
<i>Eurygaster spp.</i>								█			█		
Thrips										█			
<b>Insecticide options</b>	Seed/Soil applied insecticides:		Pyrethroids, Group 3A										
(Not all options are available in all countries. EG: Flonicamid autumn use allowed only in a few countries and only for virus protection)	Foliar applied insecticides:		Pyrethroids, Group 3A					Pyrethroids, Group 3A					
			nAChR competitive modulator, Group 4A, 4C					nAChR competitive modulators, Group 4A, 4C					
			Flonicamid, Group 29					Flonicamid, Group 29					
								Carbamates, Group 1A					

NOTE 1: Pre-mixture combinations of the available mode of action may be registered for use in some countries. In this case the recommendation to rotate different modes of action remains.

## Insecticide resistance management recommendations for insect pests of cereals in Europe (EU 27, no emergency exemptions considered)

### Autumn-Winter – Seed/Soil applied insecticides

- Currently only pyrethroids are registered for seed or soil applications in cereals and this application window should be considered during the IRM planning even if targeting only a part of the full cereal pest spectrum.

### Autumn-Winter – Foliarly applied insecticides

- If a pyrethroid was used during the previous summer for the control of cereal aphids on the same site, avoid using a foliar pyrethroid again in the autumn if possible and use a different mode of action (MOA) product if registered.

### Spring-Summer – Foliarly applied insecticides

- If more than one application is required, do not use the same MOA actives consecutively.
- If leaf beetles are a common occurrence in your region, then it is recommended to reserve pyrethroid treatments for controlling this pest and use alternative MOA for aphids.

### GENERAL RECOMMENDATIONS

- If pyrethroid resistant grain aphids (*Sitobion avenae*) are known to be present at the location, the use of pyrethroid insecticides (Group 3A) is not recommended for foliar treatments.
- Manage volunteer cereals (e.g. plowing, herbicides application) to break the “green bridge” between summer cereals and new sowings in autumn.



# Insecticide resistance management recommendations for insect pests of cereals in Europe (EU 27, no emergency exemptions considered)

Examples of application strategies that comply with IRAC resistance management recommendations:

		Autumn-Winter						Spring-Summer					
		SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
	WINTER CEREALS					OVERWINTERING							
	SPRING SOWN CEREALS												
	Soil dwelling insects												
	<i>Zabrus tenebrioides</i>												
	Dipterans												
	Cicadellidae												
	Aphids												
	<i>Oulema spp.</i>												
	<i>Eurygaster spp.</i>												
	Thrips												
<b>Pest management examples</b>  <small>(Examples presented are only to demonstrate IRM principles but there are other options also available and the target pest and registered products availability will determine the local insecticide use scenarios)</small>	Example 1 (only pyrethroids available)	Group 3A Seed Treatment						Group 3A foliar					
	Example 2 (all 4 MOA available)			Group 3A foliar						Group 4C foliar		Group 29 foliar	Group 1A foliar
	Example 3 (all 4 MOA available)	Group 3A Seed Treatment		Group 4C foliar				Group 29 foliar		Group 1A foliar		Group 3A foliar	
	Example 4			Group 29 foliar						Group 3A foliar		Group 4A foliar	