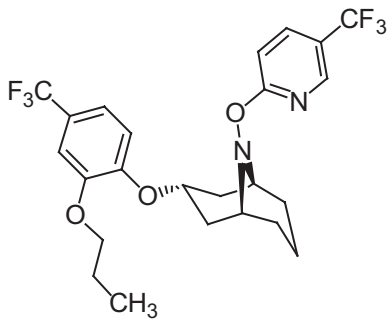
14 acynonapyr *Acaricide*



relative stereochemistry

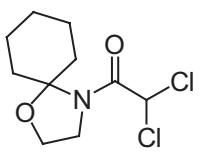
NOMENCLATURE: **Common name** acynonapyr (E-ISO, (*m*) F-ISO)
IUPAC name 3-*endo*-[2-propoxy-4-(trifluoromethyl)phenoxy]-9-[5-(trifluoromethyl)-2-pyridyloxy]-9-azabicyclo[3.3.1]nonane
Chemical Abstracts name (3-*endo*)-3-[2-propoxy-4-(trifluoromethyl)phenoxy]-9-[[5-(trifluoromethyl)-2-pyridinyl]oxy]-9-azabicyclo[3.3.1]nonane
CAS RN *[1332838-17-1]* **Development codes** NA-89 (Nippon Soda)

PHYSICAL CHEMISTRY: **M.f.** $C_{24}H_{26}F_6N_2O_3$ **Mol. wt.** 504.5

COMMERCIALISATION: **History** Under development as an acaricide by Nippon-Soda Co. Ltd. **Patents** WO 2011105506. **Manufacturers** Nippon Soda

15 AD-67 *Herbicide safener*

Target Site Induction of the biosynthesis of glutathione S-transferase (GST)
dichloroacetamide



NOMENCLATURE: **Common name** There is no ISO common name.
IUPAC name 4-(dichloroacetyl)-1-oxa-4-azaspiro[4.5]decane
Chemical Abstracts name 2,2-dichloro-1-(1-oxa-4-azaspiro[4.5]dec-4-yl)ethanone
CAS RN *[71526-07-3]*
Other names MON 4660 **EC no.** 401-130-4 **EPA PC** 600046 **Development codes** AD-67 (Monsanto)

PHYSICAL CHEMISTRY: **Composition** Tech. is ≥95%. **M.f.** $C_{10}H_{15}Cl_2NO_2$
Mol. wt. 252.1 **Physical form** White, odourless, crystalline solid. **M.p. (°C)** 105.5–107
Water solubility (mg/l, 20–25 °C) 335.0 **F.p.** 180 °C **S.g./Bulk density (20–25 °C)** 1.26
Hydrolytic stability (DT_{50}) unstable (strongly acidic, strongly alkaline)
Aqueous photolytic stability (DT_{50}) stable **Thermal stability** stable (60 °C)

COMMERCIALISATION: **History** Reported by J. Grega & J. Nagy (*Mezogazd. Kemizalasa, Anket*, 1979, **2**, 15). **Manufacturers** KisChemicals

APPLICATIONS: **Spectrum and Route of Action** Herbicide safener in maize. **Uses** Safener for thiocarbamate and chloroacetamide herbicides in maize. **Formulation types** SC; EC
Site of Action Induction of the biosynthesis of glutathione S-transferase (GST) in the crop, thus catalysing conjugation (and detoxification) of the co-applied herbicide with glutathione.

ANALYSIS: **Product Analysis** GLC **Residues Analysis** *Pestic. Anal. Man.*, **II**, 180.465

REGULATORY: **EU status** Not a plant protection product. **EPA Status** Not Registered

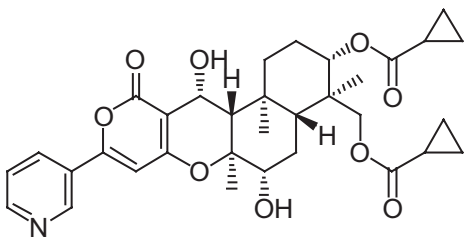
MAMMALIAN TOXICOLOGY: **Acute oral (LD_{50}, mg/kg)** rats 2000
Acute dermal (LD_{50}, mg/kg) rats >2000 **Acute Inhalation (LD_{50}, mg/l)** rats >5

ECOTOXICOLOGY: **Fish** LC_{50} (96 h) for carp 2.8 mg/l. **Daphnia** LC_{50} 2.75 mg/l.
Bees (LD_{50}, µg/bee) Practically non-toxic

ENVIRONMENTAL FATE: **Soil/Environment** DT_{50} in water 20 d (pH 4), 40 d (pH 10).

16 afidopyropen *Insecticide*

Target Site TRPV modulation (chordotonal organ transient receptor potential channel)
IRAC 9D *pyropene*



NOMENCLATURE: **Common name** afidopyropen (E-ISO); afidopyropène ((*m*) F-ISO)
Trademark name Inscalis
IUPAC name [(3*S*,4*R*,4a*R*,6*S*,6a*S*,12*R*,12a*S*,12b*S*)-3-(cyclopropylcarbonyloxy)-1,2,3,4,4a,5,6,6a,12a,12b-decahydro-6,12-dihydroxy-4,6a,12b-trimethyl-11-oxo-9-(3-pyridyl)-11*H*,12*H*-benzo[f]pyrano[4,3-b]chromen-4-yl]methyl cyclopropanecarboxylate
Chemical Abstracts name [(3*S*,4*R*,4a*R*,6*S*,6a*S*,12*R*,12a*S*,12b*S*)-3-[(cyclopropylcarbonyl)oxy]-1,3,4,4a,5,6,6a,12,12a,12b-decahydro-6,12-dihydroxy-4,6a,12b-trimethyl-11-oxo-9-(3-pyridinyl)-2*H*,11*H*-naphtho[2,1-b]pyrano[3,4-e]pyran-4-yl]methyl cyclopropanecarboxylate
CAS RN *[915972-17-7]* **EPA PC** 026200 **Development codes** ME 5343 (Meiji Seika)

PHYSICAL CHEMISTRY: **M.f.** $C_{33}H_{39}NO_9$ **Mol. wt.** 593.7 **Physical form** Yellow powder.
M.p. (°C) 150 **V.p. (mPa)** <0.0099 (25 °C) **Henry (Pa m^3 mol^{-1}, calc.)** 2.3×10^{-9}

log K_{ow} 3.45 **Water solubility (mg/l, 20–25 °C)** 25.1
Organic solubility (g/l, 20–25 °C) Soluble in acetone (>500), dichloromethane (>500), ethyl acetate (>500), *n*-hexane (0.00766), methanol (>500), toluene (5.54)
S.g./Bulk density (20–25 °C) 1.30 **Hydrolytic stability (DT_{50})** >1 y (pH 4, 7), 134 d (pH 9) (25 °C) **Aqueous photolytic stability (DT_{50})** 28 d (pH 7)

COMMERCIALISATION: **History** Reported by R. Kandasamy *et al.* (*Insect Biochem. Mol. Biol.*, 2017, **84**, 32). Discovered by Meiji Seika Kaisha Ltd and jointly developed with BASF SE. First registered in Australia in 2018. **Manufacturers** BASF

APPLICATIONS: **Spectrum and Route of Action** Non-systemic insecticide active by contact on piercing and sucking insects, local translaminar mobility. Fast-acting disrupting feeding and other behaviours, leading to death by starvation. **Uses** Control of aphids and whiteflies in vegetables, brassicas, pome fruit, stone fruit, citrus, cotton, hazelnuts and ornamentals; control of *Macrosiphum euphorbiae*, *Myzus persicae*, sweet potato whiteflies and *Bemisia tabaci* in potatoes and *Aphis glycines* in soybeans. **Site of Action** Modulation of TRPV (Transient Receptor Potential Vanilloid) channel complexes in the chordotonal stretch receptor organs, disrupting feeding and other behaviours. **Selected products** Sefina (BASF); Ventigra (BASF); Versys (BASF).

ANALYSIS: **Residues Analysis (plants**, **animal materials**) LC-MS/MS; (**soil**, **water**) LC-MS/MS (*Environ. Chem. Methods*)

REGULATORY: **Toxicological & Environmental Reviews** *APVMA Public Release Summary*, Mar. 2018; *JMPR Mtg.* (2019); *JMPR Evaln. I* (2019). **EU status** Not Approved
EPA Status Registered

MAMMALIAN TOXICOLOGY: **Acute oral (LD_{50}, mg/kg)** rats >2000
Acute dermal (LD_{50}, mg/kg) rats >2000 **Acute Inhalation (LD_{50}, mg/l)** rats >5.48
Skin irritation Not an irritant (rabbits) **Skin sensitisation** Not a sensitiser (guinea pigs)
Eye Not an irritant (rabbits) **ADI/RfD** (JMPR) ADI 0.08, aRfD 0.2 mg/kg b.w. [2019]; (EPA) cRfD 0.08, aRfD 0.16 mg/kg b.w. [2018].

ECOTOXICOLOGY: **Birds** Acute oral LD_{50} (14 d) for zebra finch 341, bobwhite quail 783 mg/kg. Dietary LC_{50} for bobwhite quail 532, mallard ducks >5044 mg/kg diet. **Fish** LC_{50} (96 h) for rainbow trout 19.98, fathead minnows 19.9, carp 17.2 mg/l. **Daphnia** EC_{50} 8.89 mg/l. **Algae** EC_{50} (96 h) for *Navicula pelliculosa* 14.73, *Anabaena flos-aquae* >44.2 mg/l; (72 h) for *Pseudokirchneriella subcapitata* 20.37 mg/l. **Other aquatic spp.** EC_{50} (7 d) for *Lemna gibba* 8.74 mg/l. **Bees (LD_{50}, µg/bee)** >200 (contact); >100 (oral) **Worms** LC_{50} (14 d) for *Eisenia fetida* >945 mg/kg soil.