Integrated Pest Management: Regional Guideline for Table Grape

PESTS and DISEASES	Intervention criteria		ACTIVE SUBSTANCE	NOTES (A)*	NOTES (B)*	Notes and use restrictions * (A) for the first active substance * (B) for the second active substance
	Restrictions	Reccomendations				
GRAPEVINE EXCORIOSIS (Phomopsis viticola)		Agronomic interventions - Remove infected parts during pruning. Do not shred or set aside shoots, but collect and burn them. Chemical interventions They should be applied during the following phenological phases: - beginning of bud break - 8-12 days after the previous treatment.	Copper	3		Control should only be applied to susceptible cultivars. (1) A maximum of three applications per year of Azoxystrobin, Pyraclostrobin, and Trifloxystrobin, regardless of the disease. (2) A maximum of three applications per year of Dithianon, Fluazinam, and Folpet, regardless of the disease. (3) Do not exceed a cumulative application of 28 kg of copper per hectare over a 7-year period, and it is recommended not to exceed an average quantity of 4 kg of copper per hectare per year.
			Folpet	2		
			Azoxystrobin	1		
GRAPEVINE DOWNY MILDEW (Plasmopara viticola)		Chemical Interventios During pre-flowering, when weather conditions predispose of infection (rain or high relative humidity), we recommend treating with contact products. When the first symptoms (oil stains) appear, treat with cytotropic or systemic sprays, alone or in combination with contact products. If weather conditions remain favorable for the disease, treat with longer-lasting anti-downy mildew products. Pay attention to the active substances application: '- Use 800-1000 L/ha of water in canopied vineyards	Copper	8		(1) A maximum of three applications per year of Amisulbron and Cyazofamid. (2) A maximum of two applications per year of Metalaxil and Metalaxil-M. (3) A maximum of three applications per year. (4) A maximum of four applications per year of Iprovalicarb, Mandipropamid, and Valiphenal. (5) A maximum of two applications per year of Fluopicolide and Metalaxil. (6) A maximum of four applications per year. (7) A maximum of three applications per year of Ditianon, Fluazinam, and Folpet, regardless of the pest. (8) Do not exceed a cumulative application of 28 kg of copper per hectare over a 7-year period, and it is recommended not to exceed an average quantity of 4 kg of copper per hectare per year. (9) A maximum of ten applications per year of Phosphonates and Fosetyl aluminum, excluding young vines. (10) A maximum of two applications per year, to be used in mixtures with active substances with different mechanisms of action. (11) Only permitted in mixtures with covering products.
			Fosetyl	9		
			Potassium phosphonates	9		
			Disodium phosphonate	9		
			Dithianon	7		
			Folpet	7		
			Laminarin			
			Cerevisane			
			Orange oil			
			Cymoxanil	3		
			Iprovalicarb	4		
			Mandipropamid	4		
			Valifenalate + Folpet	4	7	
			Metalaxil	2-5		
			Metalaxyl-M	2		
			Zoxamide	6		
			Fluopicolide	5		
			Cyazofamid + Disodium phosphonate	1	9	
			Amisulbrom	1-11		
			Ametoctradin			
			Oxathiopiprolin	10		
GRAPEVINE POWDERY MILDEW *(Oidium tuckeri*)	Pay attention to the active substances application: '- Use 800-1000 L/ha of water in canopied vineyards	<u>Agronomic interventions -</u> Arrangement and tying of shoots - Light defoliation around the bunches - Balanced fertilization and irrigation Biological interventions Use Ampelomyces quisqualis during periods of lower disease pressure, alternating with other permitted fungicides. Do not mix the product with sulfur. Do not use sulfur within 5 days of treatment with A. quisqualis. In case of rainfall exceeding 6 mm, it is recommended to repeat the treatment. Chemical interventions High-risk areas: - Until pre-flowering, apply preventively with cover products; - From pre-flowering to veraison, apply alternating systemic and cover products. Low-risk areas: - Apply cautiously immediately before flowering and continue alternating systemic and cover products. Use sulfur during the coolest hours to avoid phytotoxicity.	Eugenol + Geraniol + Thymol	10		(1) A maximum of three treatments per year withn Azoxystrobin, Pyraclostrobin, and Trifloxystrobin regardless of the adverse event. (2) A maximum of two treatments per year with Boscalid, Isofetamid, and Fluxapyroxad regardless of the adverse event. (3) A maximum of two treatments per year with Bupirimate, Proquinazid, and Pyriofenone. (4) A maximum of three treatments per year with Triazoles. (5) A maximum of two treatments per year. (6) A maximum of three treatments per year. Active substance revoked, usable until September 30, 2026. (7) A maximum of three treatments per year with Metrafenone and Pyriofenone. (8) A maximum of three treatments per year. (9) A maximum of one treatment per year. (10) A maximum of four interventions per year regardless of the adversity.
			Laminarin			
			Sulphur			
			Ampelomyces quisqualis			
			Bacillus amyloliquefaciens			
			aqueous extract of the germinated seeds of sweet *Lupinus albus*			
			Cerevisane			
			COS-OGA			
			Orange oil			
			Potassium hydrogen carbonate			
			Proquinazid	3		
			Pyriofenone	3-7		
			Bupirimate	3		
			Trifloxystrobin	1		
			Azoxystrobin	1		
			Pyraclostrobin	1		
			Cyflufenamid	5		
			Mefentrifluconazole	4		
			Penconazole	4		
			Tetraconazole	4		
			Difenoconazole	4-9		
			Calcium polysulfide			
			Spiroxamine	8		
			Boscalid	2		
			Fluxapyroxad	2		
			Metrafenone	7		
			Meptyldinocap	6		

GREY MOLD (*Botrytis cinerea*)		Agronomic interventions -Arrangement and tying of shoots - Light defoliation around the bunches - Balanced fertilization and irrigation Chemical treatments Apply once at veraison and once before the clusters close. Subsequently, for late-ripening varieties (Italia, etc.) and for those covered to delay the harvest, if necessary, apply when high relative humidity levels occur. To prevent resistance, it is recommended to alternate fungicides with different modes of action.	*Aureobasidium pullulans*			Excluding products permitted in organic farming, a maximum of three treatments per year for uncovered tents and four for covered grapes for the harvest in November-December. (1) For Boscalid, Isofetamid, and Fluxapyroxad, a maximum of two treatments per year, regardless of the adversity. (2) For Pyrimethanil and Cyprodinil, a maximum of one treatment per year, regardless of the adversity. (3) A maximum of two treatments per year, regardless of the adversity. (4) A maximum of two treatments per year. (5) A maximum of four treatments per year, regardless of the adversity. (6) A maximum of four treatments per year, regardless of the adversity. (7) For Ditianon, Fluazinam, and Folpet, a maximum of three treatments per year, regardless of the adversity. (8) At most one intervention per year. (9) At most one intervention per year.
			Potassium hydrogen carbonate			
			Bacillus amyloliquefaciens			
			Bacillus subtilis strain QST 713	5		
			Laminarin			
			Cerevisane			
			Trichoderma atroviridae strain SC1			
			Metschnikowia fructicola strain NRRL Y-27328			
			Saccharomyces cerevisiae			
			Pythium oligandrum M1			
			Eugenol + Geraniol + Thymol	6		
			aqueous extract of the germinated seeds of sweet Lupinus albus			
			Trichoderma asperellum + Trichoderma gamsii			
			Pyrimethanil	2		
			Cyprodinil + Fludioxonil	2	3	
			Fludioxonil	3		
			Fenhexamid	4		
			Cyprodinil	2		
			Boscalid	1		
			Fluazinam	7-8		
			Isofetamid	1-9		
ESCA - BLACK MEASLES (*Phaeomoniella chlamydiospora; Fomitiporia meditteranea; Phaeocremonium aleophilum*)		Agronomic interventions - When symptoms appear, cut and burn the infected woody organs and dead plants. - The cut surface must be smooth and slanted. - Disinfect cutting and grafting tools with sodium hypochlorite or quaternary ammonium salts. - Mark symptomatic plants and prune them separately from healthy plants. - Avoid "forcing" young plants. - Use sturdy propagation material that does not dim the wood. - If there are partially attacked plants, it is advisable to pollar them and raise one or more shoots for their reconstitution. - Treat large pruning cuts with disinfectant healing mastics.	*Trichoderma asperellum + Trichoderma gamsii + Trichoderma atroviride*			Treatments with copper-based products against downy mildew have a protective effect. (1) Brown treatments on pruning cuts.
			Boscalid + Pyraclostrobin		1	
FRUITS ROT (*Penicillium spp; Aspergillus spp*)		<u>Chemical treatments</u> At veraison or pre-harvest.	Cyprodinil + Fludioxonil	1	2	(1) Between Pyrimethanil and Cyprodinil, a maximum of one treatment per year, regardless of the adverse event. (2) A maximum of two treatments per year, regardless of the adverse event.
	Pheromone traps must be placed, two to three per homogeneous plot, during the fruit set phase. Apply only to the second and third generations. For the second and third generations, the timing of application must be determined based on the flight curve recorded with the pheromone traps and the pesticide chosen		MATING DISRUPTION			(1) A maximum of one treatment per year. (2) A maximum of one treatment per year regardless of the adverse event. (3) A maximum of two treatments per year. (4) A maximum of three treatments per year between pure pyrethrins and pyrethroids, regardless of the adverse event. (5) A maximum of three treatments per year regardless of the adverse event. (6) A maximum of two treatments per year. (7) A maximum of one treatment per year between esfenvalerate, etofenprox,
			Bacillus thuringiensis			
			Acetamiprid	2		
			Azadiracthin			
			Tebufenozide	6		
			Spinosad	5		
			Chlorantraniliprole	1		
			Etofenprox	4-7		
			Emamectin benzoate	3		

EUROPEAN GRAPEVINE MOTH (*Lobesia botrana*)	for control, where available, and on the egg-laying pattern, detected with specific surveys and/or forecast models. *Bacillus thuringiensis:* Apply 4–5 days after the start of trapping and repeat the treatment after about a week. Growth regulators: Apply 3–4 days after the start of trapping. Other insecticides: Sample 100 bunches per hectare. Intervene when the following threshold is exceeded: 3–4% of grapes infested with larvae or with penetration holes.					and lambda-cyhalothrin regardless of the adverse event.
WESTERN FLOWER THRIPS (*Frankliniella occidentalis*)	Detect the presence of thrips with blue chromotropic traps (also monitoring the spontaneous flora present early) and shaking the inflorescences. Chemical Treatments Apply when the following threshold is exceeded: 10–15 captures per trap per week or 2–3 thrips per bunch.	Sampling 50–100 bunches per hectare, using the shaking technique. Conduct treatment before flowering and, if necessary, during and after flowering, taking into account any prolonged flowering periods and the intensity of the infestation. Pay attention to products labeled with a prohibition on use during flowering.	Potassium salts of fatty acids Beauveria bassiana ATCC 74040 Azadiractin Spinosad Formetanato Flupyradifurone Etofenprox Lambda-cyhalothrin Tau-fluvalinate	 2 1 4 3-6 3-6 5-6		Except for products permitted in organic farming, a maximum of three treatments per year, including Spinosad, should be used against this pest. (1) A maximum of one treatment per year, regardless of the pest. (2) A maximum of three treatments per year, regardless of the pest. (3) A maximum of one treatment per year of Esfenvalerate, Etofenprox, and Lambda-cyhalothrin, regardless of the pest. (4) A maximum of one treatment per year. (5) A maximum of one treatment per year, regardless of the pest. (6) A maximum of three treatments per year of pure Pyrethrins and Pyrethroids, regardless of the pest.
VINE THRIPS (*Drepanothrips reuteri*)	Chemical defense Treat only after the detection of a widespread infestation on the vegetation		Potassium salts of fatty acids Beauveria bassiana ATCC 74040 Orange oil Spinosad Formetanate Azadirachtin Acetamiprid Etofenprox Tau-fluvalinate	 1 2 4 3-5 3-6		Excluding products permitted in organic farming, a maximum of one treatment against this pest, including Spinosad. (1) A maximum of three treatments per year regardless of the pest. (2) A maximum of one treatment per year regardless of the pest. (3) A maximum of three treatments per year for pure pyrethrins and pyrethroids, regardless of the pest. (4) A maximum of one treatment per year regardless of the pest. (5) A maximum of one treatment per year for esfenvalerate, etofenprox, and lambda-cyhalothrin regardless of the pest. (6) A maximum of one treatment per year regardless of the pest.
MEALYBUGS (*Targionia vitis (armored scale*)*; Planococcus* spp.*; Pseudococcus* spp.)	Chemical defense: Treat locally only on infested plants; - treat the entire vineyards only in case of generalized attacks.	Mechanical interventions ' - Make debarking and brushing of stumps in the infected area Agronomic interventions - Balanced fertilization and irrigation - Light leaf thinning around the bunches Chemical defense '-The most suitable period for T vitis is in correspondence with the exit of nymphs (may - june).	mineral oil Beauveria bassiana ATCC 74040 MATING DISRUPTION Acetamiprid Pyriproxyfen Flupyradifurone MALTODESTRIN	 1 2 3 		Except for products permitted in organic farming,a maximum of one treatment per year against this pest. (1) A maximum of one treatment per year regardless of the pest. (2) A maximum of one treatment per year. (3) A maximum of one treatment per year regardless of the pest.
EUROPEAN RED MITE (*Panonychus ulmi, Tetranychus urticae)*	Chemical interventions Intervene when the following threshold is exceeded: - 30% of leaves infested with mobile molds and insufficient presence of the predatory beetle Stethorus punctillum.	Sampling is performed on 100 leaves per hectare, randomly collected.	Beauveria bassiana ATCC 74040 Potassium salts of fatty acids Maltodestrin Acequinocyl Fenpiroximate Exitiazox Formetanate Tebufenpyrad	 1 2		Except for products permitted in organic farming, a maximum of one treatment per year is recommended for this pest. (1) A maximum of one treatment per year regardless of the pest. (2) A maximum of one treatment per year regardless of the pest. Sulfur, used as an anti-mildew agent, also has a containment effect against mites.
	Chemical defense: - Treat only in case of strong attack	Chemical defense: - At the begininning of vegetative restart if the presence was detected' - In case of confirmed presence on leaves to avoid damages on berries	Potassium salts of fatty acids *Paecilomyces fumosoroseus* Sulphur Maltodestrin Formetanate	 1		Except for products permitted in organic farming, a maximum of one treatment per year is recommended for this pest. (1) A maximum of one treatment per year regardless of the pest. (2) A maximum of one treatment per year regardless of the pest. Sulfur, used as an anti-mildew agent, also has a containment effect against mites.

			Tebufenpirad	2		
MEDITERRANEAN FRUIT FLY (*Ceratitis capitata*)	Use Trimedlure traps to monitor flights. <u>Chemical treatments</u> For full-canopy treatments, spray when the first fertile bites appear.	The treatments against the third generation of grapevine moth are effective also against the infestation of med fruit fly.	Attract & Kill devices impregnated with Deltamethrin, Esfenvalerate, or Lambda-cyhalothrin.			(1) A maximum of one intervention per year regardless of the adversity.
			Acetamiprid	1		
SPOTTED WING DROSOPHILA (*Drosophila suzukii*)			Deltamethrin	2		(1) A maximum of one intervention per year (2) A maximum of two intervention per year (3) A maximum of three intervention per year
			BAITS WITH DELTAMETHRIN			
			Acetamiprid	1		
			Spinosad	3		
			Tau-fluvalinate	1		
VINE WEEVIL (*Otiorhynchus spp.*)		<u>Agronomic interventions:</u> - Use protection barriers (acrylic resinate). <u>Chemical defense:</u> - Treat when adults appear.	Spinosad	1		At most one intervention against this adversity. (1) At most three interventions per year, regardless of the adversity.
HONEYDEW MOTH (*Cryptoblabes gnidiella*)		Monitor the adults presence with pheromones traps. Monitor the clusters from august to verify the presence of larvae.	Chlorantraniliprole	1		(1) A maximum of two intervention per year
			Bacillus thuringiensis			
			Emamectin	1		
			Tebufenozide	1		
GRAPE PHYLLOXERA (*Viteus =Dactulosphaira vitifoliae*)		Intervene when the first galls appear	Acetamiprid	1		(1) A maximum of one intervention per year regardless of the adversity. (2) A maximum of one intervention per year regardless of the adversity.
			Flupyradifurone	2		
LEAFHOPPERS (*Empoasca vitis; Jacobiasca lybica*)	Treat when the following thresholds are exceeded: - Green leafhopper (E. vitis), 1–2 nymphs/leaf; - African leafhopper (J. lybica), 0.5–1 nymph/leaf	Agronomic intervention- - Balanced fertilization and irrigation - Light leaf thinning around the bunches - Avoid excessive vigor and drooping training systems - Rational arrangement of shoots Detect the presence of adults with three yellow chromotropic traps per hectare,placed from mid-May to October on the middle wire of the trellis, checked and replaced every fortnight. To assess the level of leafhopper infestation, it is necessary to record the number of nymphs present on the underside of approximately 100 leaves per hectare collected from the middle of the plants during the summer period (July-August). Chemical Treatments Green leafhoppers, especially in young plants and in the presence of more sensitive grape varieties, can cause complete desiccation of the leaf parenchyma, incomplete lignification of the shoots, and impaired ripening of the bunches.	*Beauveria bassiana* ceppo ATCC 74040			Excluding products permitted in organic farming, a maximum of one treatment may be used against this pest, including pure pyrethrins. (1) A maximum of one treatment per year, regardless of the pest. (2) Allowed only against Empoasca vitis. (3) A maximum of one treatment per year of esfenvalerate, etofenprox, and lambda-cyhalothrin, regardless of the pest. (4) A maximum of one treatment per year, regardless of the pest. (5) A maximum of one treatment per year, regardless of the pest. (6) A maximum of three treatments per year of pure pyrethrins and pyrethroids, regardless of the pest.
			Mineral oil			
			Orange oil	2		
			Pyrethrins	6		
			Potassium salts of fatty acids			
			Flupyradifurone	2-5		
			Azadirachtin			
			Acetamiprid	1-2		
			Etofenprox	3-6		
			Tau-fluvalinate	4-6		
			Esfenvalerate	3-6		