# EPPO Datasheet: *Euphorbia davidii*

Last updated: 2026-01-15

## IDENTITY

**Preferred name:** *Euphorbia davidii*
**Authority:** Subils
**Taxonomic position:** Plantae: Magnoliophyta: Angiospermae: Fabids: Malpighiales: Euphorbiaceae: Euphorbioideae
**Other scientific names:** *Euphorbia dentata var. gracillima* Millsp., *Euphorbia dentata var. lancifolia* Farw.
**Common names:** David's spurge, toothed spurge
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**EPPO Categorization:** A2 list, Alert list (formerly), List of Invasive Alien Plants
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**EPPO Code:** EPHDV

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## GEOGRAPHICAL DISTRIBUTION

*Euphorbia davidii* is native to the USA (Arizona, California and New Mexico) and Mexico (north-east and north-west).

### History of introduction and spread

*Euphorbia davidii* is native to the USA (Arizona, California and New Mexico) and Mexico (north-east and north-west) (POWO, 2024). In the Flora of North America (FNA, 2016) it is stated that *E. davidii* is native to the south-western United States and northern Mexico, north through the southern Great Plains; it is apparently introduced elsewhere in the United States.

There is some confusion on the status of the species *E. davidii*. It is considered an alien species in Argentina (Marchessi et al., 2011a). *E. davidii* was described in 1983 from Argentina (Subils, 1984) and it was widely believed that the species originated from there. Likewise, the POWO (2024) indicates Argentina as the native range for the species. Misinterpretations of the taxonomy presented by Mayfield (1997), by the databases BONAP (Kartesz, 2015) and the USDA NRSC (2025) have led to the erroneous concept that *E. davidii* in North America is non-native.

In its invasive range, *E. davidii* is established in Australia; it has been recorded as a weed in agriculture (Randall, 2007). Observations are available from New South Wales, Queensland, South Australia and Victoria (Atlas of Living Australia, 2024). It occurs in heavily disturbed areas such as roadsides and inland from Sydney, though it is not considered a major invader. The species is classified differently across states, for example, as an ‘emerging weed’ in New South Wales and as naturalized in Victoria (J. Le Roux, pers. comm., 2025).

In South America, *E. davidii* was detected in Argentina in the Buenos Aires province (Azul district) in 1983, located in isolated pockets; currently, the species is distributed over 85% of the agricultural area of that district. Its presence has also been recorded in several other districts of the province (Juan et al., 1996; Juan & Saint André, 1995; Marchessi et al., 2011a). The species has also been found as a weed in the provinces of Córdoba and San Luis (Rauber et al., 2018; F. Núñez Fré, pers. comm., 2024).

In the EPPO region, *E. davidii* (as *E. dentata*) was first reported in Europe in 1961 in North Ossetia (Herbarium of Moscow State University, 2024). Following this, the species was collected in row crops and vineyards around Pyatigorsk in 1968 and then in Mineralnye Vody city (North Caucasian Federal District) (as *E. dentata*) (Mikheev, 1971). At present, it has been recorded in St. Petersburg (port), Moscow region, Chuvashia and Udmurtia, Rostov region, Belgorod region, Saratov region, Astrakhan region, Volgograd region, Krasnodar and Stavropol Krais, Karachaevo-Cherkessia Republic, Kabardino-Balkaria Republic, North Ossetia Republic, Dagestan Republic and

Chechenskaya Republic (Berezutsky, 2017; Geltman, 2012, 2020; Kulakova & Popov, 2018; Mallaliev & Zalibekov, 2018; Plantarium, 2024; Shhagapsoev et al., 2017; Shkhagapsoev et al., 2022; Tokhtar & Yu, 2019).

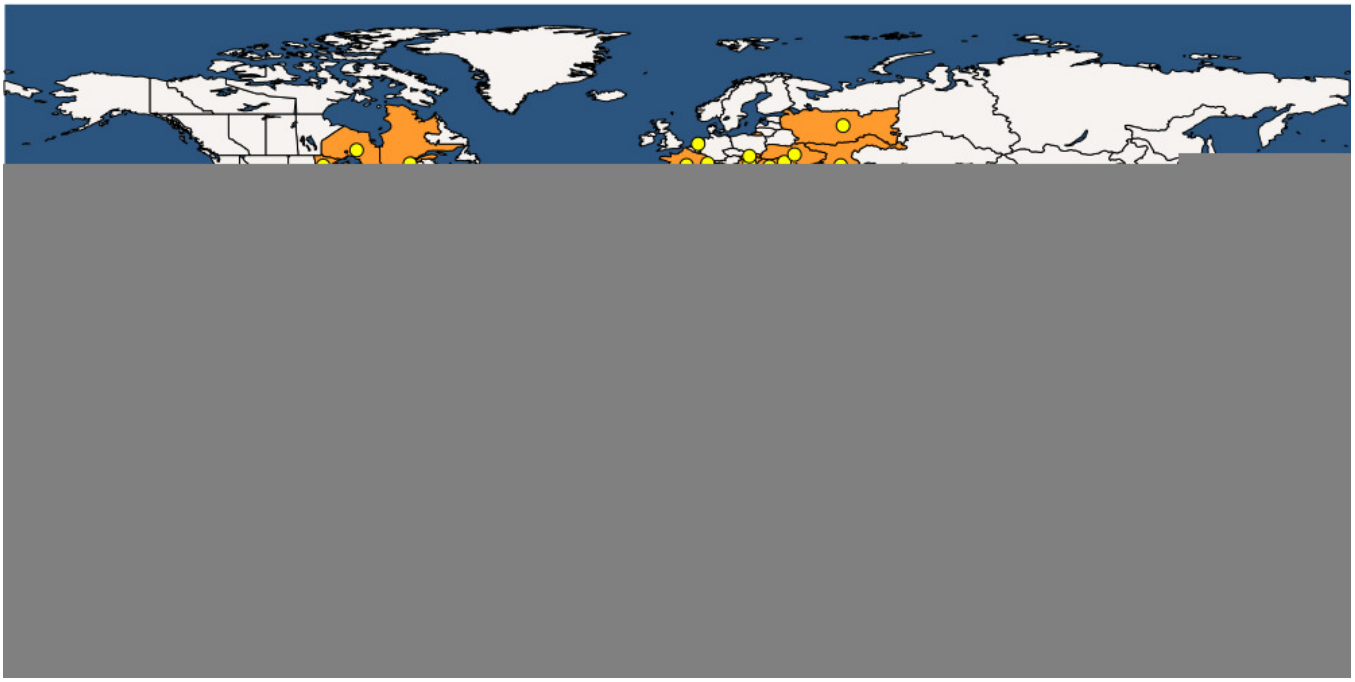
In Ukraine, the first record is from the area of Odessa port on the Black Sea in 1989 (Shevera et al., 2023). All identified localities of the species at that time were confined exclusively to the railroad tracks at railway stations or, less often, other areas where railroad transportation is also used. From 2009 onwards, new localities of *E. davidii* were discovered in other administrative regions of Ukraine (e.g. Poltava, Kharkiv, Mykolajiw and Crimea) (Shevera et al., 2023).

In Serbia, it is reported as established where it was recorded in 2007 in two localities in Vojvodina on arable fields (Purger et al., 2015) where it still persists (D. Marisavljevi?, pers. comm., 2024). In Hungary, *E. davidii* was discovered in a crop field in 2008 in Igar (Fejér county) (Pinke et al., 2012). In 2024, the species was still present at this site (S. Follak, pers. comm., 2024).

In France, the first record of *E. davidii* occurred in 1997 in a vineyard in the vicinity of Nîmes in the Mediterranean region. Regular monitoring confirmed its presence in this area until 2009 (G. Fried, pers. obs., 2009). Since its initial detection, the species has been reported in 25 additional locations, primarily in the southern part of France (south-west and Mediterranean France) and less frequently in the Paris region and Burgundy.

In Belgium, *E. davidii* (as *E. dentata*) is considered a rare transient species. It was first recorded in 1986 in the port of Ghent. Then, it was observed twice at the Ghent Grain Terminal at the Rodenhuizedok (in 1996 and 1999), most probably as a soybean alien (single specimens). Finally, it was recorded on a dump in Rumbeke-Roeselare in 2003 and on the verge of an unloading quay near a grain mill in the port of Roeselare in 2004 (Verloove, 2024). It is also recorded as transient in the Netherlands where it is documented twice as *E. dentata*: a first record in 1964 as a casual in a roadside (near Bodegraven) and underneath a hedge of a parking area in 1984 (Utrecht) (Van Oostroom & Reichelt, 1965). The herbarium specimens at Naturalis Leiden have been reidentified as *E. davidii* by Leni Duistermaat in 2025.

Countries where the status of the species is unclear include Georgia, Moldova, Romania, Slovakia, Spain and Switzerland.



**EPPO Region:** Bulgaria, France (mainland), Georgia, Hungary, Italy (mainland), Moldova, Republic of, Netherlands, Romania, Russian Federation (Central Russia, Southern Russia), Serbia, Slovakia, Spain (mainland), Switzerland, Ukraine, Uzbekistan
**Asia:** Uzbekistan
**North America:** Canada (Ontario, Québec), Mexico, United States of America (Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Illinois, Indiana, Iowa, Kansas, Kentucky, Mainland

USA, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, Wyoming)
**South America:** Argentina
**Oceania:** Australia (New South Wales, Queensland, South Australia, Victoria)

## MORPHOLOGY

### Plant type

Annual herbaceous plant.

### Description

The following description is primarily based on the Flora of North America (FNA, 2016), Vladimirov and Petrova (2009) and Mayfield (1997).

**Roots:** *E. davidii* has a taproot. **Stems:** solitary, erect or ascending, 20–70?cm tall, up to 4?mm thick at the base, with opposite, arcuately ascending branches. **Leaves:** opposite, with 7–25?mm long petioles, blades 1–10?×?0.5–3.5?cm, lanceolate to broadly elliptic, widest in the middle, attenuate at the base, bluntly acute to acuminate at the apex. **Flowers:** synflorescence umbellate, flat-topped to slightly rounded, with numerous cyathia. Ray leaves narrowly elliptic to lanceolate, shortly petiolate, paler at the base. Cyathia involucres cylindriform, glabrous, green, 2.5–3.0?×?1.3–1.8?mm; involucral lobes subsequently divided into 5–7 linear lobes with swollen apical cells. Glands 0.9?×?1.3?mm, solitary, cupped with oblong mouth, pale-yellow, stipitate glands. Staminate flowers 5–8 in a fascicle. Pistillate flower pedicel elongating to ~3?mm, exceeding cyathia; ovaries usually glabrous, seldom sparingly strigose.

There is a high potential for misidentification between *Euphorbia dentata* Michx. (toothed spurge), *E. davidii* and *E. heterophylla*, another common contaminant in soybean imported into the EPPO region. Guides for the identification of the species should be consulted (Barina et al., 2013). *E. heterophylla* can be more readily distinguished due to its alternate leaf arrangement, more finely serrated margins and distinctly different leaf shape.

Images of *E. davidii* can be retrieved from the EPPO Global Database (EPPO, 2025).

## BIOLOGY AND ECOLOGY

### General

*Euphorbia davidii* is an annual species with a spring–summer cycle. In the EPPO region, flowering occurs from August to September; fruits are formed in September to October (Oprea et al., 2012; Purger et al., 2015; Vladimirov & Petrova, 2009).

*Euphorbia davidii* reproduces by seed. A single plant can form between 100 and 300 seeds (Petrova et al., 2013; F. Núñez Fré, pers. comm., 2025). Seed production is influenced by population density that increases up to a density of 150 individuals $m^{?2}$. Núñez Fré et al. (2018a) showed that an average seed production in the first, second and third cohort was 5700, 6400 and 1900 seeds $m^{?2}$, respectively (experimental site with no crop competition).

*Euphorbia davidii* builds up a large and persistent soil seed bank with several thousand seeds $m^{?2}$. More than 20 000 seeds $m^{?2}$ were estimated in fields in Argentina (Núñez Fré, 2019; Núñez Fré et al., 2014). Generally, most seeds are found in the upper soil layer (0–5?cm), but this varies depending on the soil cultivation system (no-till vs. tillage). Euphorbia davidii exhibits strong seed dormancy, leading to substantial year-to-year variation in seedling emergence under field conditions. Seeds can remain viable for several years. Marchessi et al. (2011b) investigated the germination capability of seeds harvested in 1995 (14?years old) and 2009 (2?years old), stored in laboratory conditions.

**Habitats**

In its native range, in North America, *E. davidii* has been found in forests, along streams and riverbanks, prairies (grassland), roadsides and open disturbed areas (FNA, 2016). It is also considered to be a weed in agricultural areas (FNA, 2016; Verloove, 2024). For example, in Montana (USA), the species was recorded along roadsides at interstate junctions and in city parks (Montana Field Guide, 2024).

According to the analysis of Barina et al. (2013), European records are associated with railways (65.5 % of the known occurrences), followed by agricultural land (17.2 %) and other habitat types (6.9 %, incl. vineyards and other ruderal environments). Within the EPPO region, the species is largely associated with vegetated man-made habitats, especially with transportation networks and cargo handling areas in ports and railway stations (e.g. Bondarenk & Myroonov, 2021; Conservatoire botanique national méditerranéen, 2024; Galasso et al., 2019; Shevera et al., 2023; Verloove, 2024) as well as crop fields and vineyards (Barina et al., 2013; Pinke et al., 2012; Purger et al., 2015).

In France, *E. davidii* has been observed in five habitat types, including vineyards, summer crops (four sites, particularly soyabean and maize), riverbanks (four sites in the Mediterranean), roadsides (six records) and railway ballast and surrounding areas (six records) (G. Fried, pers. comm., 2024).

*Euphorbia davidii* occurs regularly along the railroads from coastal areas in France, near Marseille to the Cévennes via Avignon (Conservatoire botanique national méditerranéen, 2024; Girod et al., 2007; Girod & Fried, 2011). *Euphorbia davidii* was recorded in Romania in 1997 (as *E. dentata*) in the railway station of Socola (city of Ia?i). Later, it was also found in the railway stations of Buz?u (Buz?u County), Tecuci and Movileni (both Galai? County) in Romania. *Euphorbia davidii* is usually found along railway tracks in Italy (Galasso et al., 2011, 2019). *Euphorbia davidii* has been found for the first time in 2012 in south-eastern Slovakia on railway tracks in Ma?ovské Vojkovce, very close to the Ukrainian border (Jehlík et al., 2013). Recently, in 2019, the species was found at two other locations in eastern Slovakia, namely at the railway station in Bánovce nad Ondavou and along railway tracks near Trebišov (Dudáš et al., 2019). Most localities of the species occur along railways and tracks in the Russian Federation (Y. Kulakova, pers. comm., 2024). In Ukraine, early identified localities of the species were confined to railroad tracks at railway stations and, less often, other areas where railroad transportation was also used (Huzik et al., 1997).

In Switzerland, *E. davidii* was recorded in an industrial zone in Bussigny-près-Lausanne in 2011 (Hoffer-Massard, 2011). *E. davidii* was recorded on a dump site and on the verge of an unloading quay near a grain mill in a port in Belgium (Verloove, 2024). *E. davidii* was found in Tbilisi in road and path margins around a petrol station in Georgia (Raab-Straube von & Raus, 2020).

In Uzbekistan, it occurs in ruderal habitats and rocky habitats (i.e. cliffs and rock outcrops with very shallow or no soil; Makhkamov et al., 2024).

**Environmental requirements**

The optimal temperature for vegetative growth is between 20 and 25°C. *E. davidii* grows until the first frost occurs. The growth of *E. davidii* is restricted at low temperatures (F. Núñez Fré, pers. comm., 2025). The species has been found to require ~1100–1200 growing degree days with base 8°C (GDD8) to reach reproductive stage (Molinari et al., 2022; Núñez Fré et al., 2018a, 2018b).

*Euphorbia davidii* is adapted to a wide range of soil conditions. In the EPPO region, *E. davidii* can be found on different substrates, such as chernozem-like soil or limestone gravel in places with sandy-clay soil (Oprea et al., 2012; Purger et al., 2015; Vladimirov & Petrova, 2009). In Argentina, *E. davidii* grows on the typical argiudoll soil type, which predominates in agricultural areas there. Both soil types (chernozem-like and argiudoll) are characterized by a high organic matter content (more than 3%). However, the species is also well adapted to soils with lower organic matter content and sandy soils, which are characteristic of the Western part of the Buenos Aires Province (F. Núñez Fré, pers. comm., 2024).

The species is adapted to tolerate dry conditions (FNA, 2016; Montana Field Guide, 2024). *E. davidii* can vary

greatly in size, with individuals growing larger on well-watered sites (Montana Field Guide, 2024). Soilborne pathogens, particularly those causing damping-off, can result in substantial plant stand loss when excessive moisture is present, especially in potted plants under greenhouse conditions (F. Núñez Fré, pers. comm., 2025).

### Natural enemies

Specific natural enemies are not known to occur on *E. davidii* within the EPPO region. Generalist natural enemies may potentially attack the plant, but these are unlikely to cause enough damage to influence establishment. In Argentina, thrips, grasshoppers and whiteflies can attack this species. However, significant increases in mortality are only observed when these attacks occur during the early stages of its life cycle, particularly under conditions of severe drought.

In general, the genus *Euphorbia* produces latex, which is rich in secondary metabolites. They are naturally defensive compounds in plants, which have significant antifeedant and growth-inhibitory effects on herbivorous insects.

### Uses and benefits

There are no known uses or benefits.

## PATHWAYS FOR MOVEMENT

The main pathways for movement into and within the EPPO region are as a seed contaminant of grain and seed.

**Grain (*Glycine max*, *Helianthus annuus* and *Zea mays*)**
*E. davidii* has been intercepted in grain (*G. max*) from the USA to Canada (Wilson et al., 2016). *E. davidii* has been identified from *Z. mays* grain intended for local distribution in Argentina (Núñez Fre, pers. comm., 2025). In the EPPO region, the species has been recorded in port areas where grain and oilseeds are handled and/or processed. In Ukraine, the initial introduction of *E. davidii* was associated with imported grain cargo (Shevera et al., 2023). In Belgium, it was most likely introduced as a soybean alien (Verloove, 2024) based on observations and locations of the plant in the port areas. The spread of *E. davidii* is associated with railway lines (Barina et al., 2013), indicating that goods (i.e. grain) contaminated with seeds play a significant role here.

**Seed (*Glycine max*, *Helianthus annuus* and *Zea mays*)**

The probability that seeds of *E. davidii* are associated with the pathway at the point of origin depends mainly on the crop species concerned. The species grows in spring crops such as soybean and maize, and on the exact origin of the imported product and the degree of infestation of this region by *E. davidii*. Seeds will be present on *E. davidii* plants when crops are being harvested. The seeds can be released during the harvesting process. The likelihood that *E. davidii* seeds are associated with the pathway at the point of origin greatly depends on the effectiveness of the management measures implemented during cultivation and the sorting procedures that can be implemented at the origin before export. There will be a lower risk of contamination in certified seed. Seed is sorted after harvest and submitted to quality requirements when it is certified, which will reduce the probability of association (EU Marketing Directives, OECD Standards).

## IMPACTS

### Effects on plants

In North America, *E. davidii* has been mentioned as a weed in agricultural systems (FNA, 2016; Verloove, 2024). However, no scientific data on the abundance and impact of *E. davidii* in crops has been found; it is likely this entry can be attributed to misidentification. Its congener *E. dentata* was described as a weed of cereals and maize (Jones et al., 2001; Vangessel et al., 1995; Wicks et al., 2003).

In Argentina, *E. davidii* is mainly found in soybean, but also in other summer crops, such as sunflower and maize. It was also reported in cereals (wheat) (Juan et al., 1996; Rauber et al., 2018). *E. davidii* is considered a highly competitive species and difficult to control due to the low efficacy of most chemical treatments associated with the great dependence of the phenological stage of the weed at the time of control (Juan et al., 2011; Núñez Fré, 2019). Núñez Fré et al. (2022) also showed that the nutritional status of the soil (phosphate, nitrogen and sulphur contents) could influence the efficacy of glyphosate treatments. Population density in the fields can be very high and has increased in recent years. Studies conducted on agricultural plots reported weed densities ranging between 20 and 200 plants $m^{?2}$ (Juan et al., 1996), while recent surveys indicated densities of *E. davidii* ranging from 300 to 900 plants $m^{?2}$, most likely resulting from difficulties in controlling the plant (Juan et al., 2011; Núñez Fré et al., 2014).

Few studies have documented the effect of various densities of *E. davidii* on soybean yield. A field study carried out by Juan et al. (2003) in the Buenos Aires Province (Azul district) reported that in soybean, 100 plants $m^{?2}$ of *E. davidii* caused yield losses close to 700?kg $ha^{?1}$, representing more than 30% yield reduction compared to the weed-free control. Significant effects have already been observed from densities of 8–10 plants $m^{?2}$ indicating a high competitive ability of the weed. The main yield component affected was the number of pods per plant, which showed a 15% difference compared to the control at a weed density of 20 plants $m^{?2}$ (Juan et al., 2003). Significant variations were also detected in indicators such as seeds/pod, number of trifoliate leaves, and, to a lesser extent, the weight of 1000 seeds (Juan et al., 2003; Juan & Saint André, 1995).

The potential economic impact of *E. davidi*i in the EPPO region could be significant if the species spreads and establishes in further areas. *E. davidii* has the potential to colonize crop fields and infest various crops. Numerous observations of occurrences of the species in fields from EPPO countries are known. However, there is no specific data on the effects on crop yield and quality. If agricultural land is left fallow, *E. davidii* may have the potential to colonize these fields and build up a seed bank. This can incur additional economic impact to revert the land back to its former state.

The species can occur in high densities. In France, densities of thousands of individuals have been recorded in maize fields (Lobelia, 2024). Likewise, in Hungary, in maize, the ground cover of *E. davidii* varied within the field, ranging from 0.1 to 30.0 % (Pinke et al., 2012).

In Serbia, *E. davidii* has invaded crop fields (Purger et al., 2015). Here, according to observations (i.e. not based on experiments), the populations of *E. davidii* had some effects on the crops cultivated (Pinke et al., 2012; Vajgand et al., 2014). Vajgand et al. (2014) reported that maize plants and ears were smaller.

Sunflower in infested fields has been shown to ripen ~15–20?days earlier than plants in the same field without *E. davidii*, and sunflower heads were much smaller. In some fields infested with *E. davidii* in Serbia, sunflower cultivation has stopped on 300?ha of agricultural land; and another less economically valuable crop is grown (D. Marisavljevi?, pers. comm., 2024). In Ukraine, *E. davidii* has been found in a sunflower field (Moysiyenko et al., 2020) though there are no reports of impact.

In the Russian Federation and Uzbekistan, *E. davidii* (as *E. dentata*) has been observed as a weed of sunflower, onions, cereals and row crops as well as in vineyards (Kudryavtseva & Chernetsova, 1993; Mikheev, 1971). The weed density of the abandoned Brassica field in North Ossetia contained more than 30 plants $m^{?2}$ (Y. Kulakova, pers. comm.).

In Italy, *E. davidii* has infested soybean fields (Viggiani, 2015). The author reported 50–300 plants $m^{?2}$, which indicates strong competition with the crop and suggests yield losses for soybeans.

### 7.2 Environmental and social impact

There are no reports of environmental impact.

## CONTROL

In general, planting crops with different life cycles (e.g. winter crops) places *E. davidii* at a disadvantage to germinate and survive. Moreover, this can allow a greater variety of herbicides and other weed management strategies to be used. Individual crops should be managed to enhance their competitive ability. Depending on the crops, this would include row spacing, planting density and planting date. Tillage can affect the number of seeds in the shallow seed bank (Núñez Fré, 2019).

Herbicides can be used to control *Euphorbia* spp. (Araldi de Castro et al., 2023; Storrie, 1996; Vajgand et al., 2014). In Argentina, glyphosate is used to control the species as mainly transgenic glyphosate-resistant soybeans are grown. However, a great variability has been observed in the control effectiveness obtained with glyphosate applied at a range of doses (Juan et al., 2011). In general, the control efficacy of *E. davidii* depends strongly on the developmental stage at the time of application. From the branching stage, particularly at flowering, it becomes harder to achieve controls over 75% at label doses of glyphosate applied (Juan et al., 2011). Moreover, recent studies have reported different sensitivities of populations of *E. davidii* to glyphosate (Núñez Fré, Juan, Yanniccari, et al., 2018).

Istilart et al. (2015) reported that the application of glyphosate in mixtures with some active ingredients with different mechanisms of action (e.g. fluroxypyr) gave acceptable levels of control (Argentina, Buenos Aires Province). In Serbia, Vajgand et al. (2014) evaluated the efficacy of several herbicides. Only the application of glyphosate on (wheat) stubble was efficient.

The availability of effective herbicides to control *E. davidii* is restricted

## REGULATORY STATUS

In the EPPO region, *E. davidii* is included on the EPPO A2 list of pests recommended for regulation as a quarantine pest.

## PHYTOSANITARY MEASURES

EPPO (2025) recommends that *E. davidii* should be recommended for regulation as a quarantine pest. Phytosanitary measures should be recommended for grains (*Glycine max, Zea mays, Helianthus annuus*) and include the following: grain has been produced in a pest-free area (PFA) or grain has been produced in a pest-free production site (PFPS) or pest-free place of production (PFPP) for *E. davidii* or grain has been sampled according to ISPM 31 and inspected, and found free from *E. davidii* or grain has been devitalized according to an appropriate method. For seed of *Glycine max*, *Helianthus annuus* and *Zea mays*, certified seed should be used.

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