# AGROPYRUM REPENS (L.) BEAUV.

*Common names:*
Common agropyrum
Small dog's tooth
False spear grass

## Growing cycle:

A perennial (hence the name of the species), it spreads almost solely by vegetative reproduction, thanks to long underground rhizomes 2-3 mm / 0.08-0.12 inches) in diameter. It blooms starting in May and sometimes even at the end of fall; the fruits are kernels that remain attached to the ear.
The grown plant, measuring up to 150 cm / 59 inches, has an erect and tillering bearing, with many straight culms, smooth and mostly hairless, some of which never produce flowers.
Though not frequently, the seedling can produce tillers very early.
A single plant generally does not produce many seeds, which will germinate in the soil's first layers, progressively during spring and fall.
The common Agropyrum reproduces itself also by stolons and fragments of rhizomes.

## Environment:

it is a mesothermal species, sometimes used for lawns; it is not demanding and very widespread- up to 1,500-2,000 m / 5,000-6,500 feet above sea level. It prefers shady places with clay-loam soils, rich in nitrogen and preferably with an acid pH. It can be found on fallow lands, in vineyards and orchards, open fields, roads, riverbanks and beaches (it can tolerate flooding and water-saturated soils).

## Geographic distribution:

Eurasia, South America, Australia, New Zealand.

## Economic importance:

Very damaging because it is vigorous and strongly competitive against other plants for space and air.

## Control measures:

The control of this perennial weed is based mainly on springtime treatments using glyphosate and, as a preventive measure, during fall-winter, treatment with propyzamide.

# SONCHUS SPP. (L.)

## Growing cycle:

It is a perennial plant, with underground stolons, which germinates in summer and blooms between summer and autumn (pollination is direct and carried out by insects).
The adult plant can reach a height of 150 cm / 59 inches. The stem is branched, bristly at the top and with hairless leaves.
Each plant produces up to 4,700 seeds that germinate on the soil's surface (never beneath 2 cm / 0.8 inch). This species is typical of nutrient-rich (especially nitrogen) and not-too-dry soils.
Dissemination is carried out by the wind, water and the plant itself; propagation is carried out by animals and man.

## Environment:

It prefers silty, nitrogen-rich soils, sunny and moderately warm areas, up to sub-alpine level. It infests all kinds of crops and the areas next to rivers banks, ditches and lakes.

## Geographic distribution:

It is found in all the world's temperate zones.

## Economic importance:

It can cause moderate or serious damage because of the nitrogen and the space it takes away with its aboveground and underground organs. Hoeing helps to spread this weed because it chops the stolons. It is an intermediate host of some plant disease agents.

*Common names:*
Sowthistle
Weedy Sowthistle

## Control measures:

Between the rows operations, as well as mulching, enable optimal control of this species. It is worth mentioning the possibility of burying the seeds with superficial plowing to avoid their germination.

# SOLANUM NIGRUM (L.)

*Common names:*
Black nightshade
Deadly Nightshade
Garden Nightshade

## Growing cycle:

This solanaceous plant has an annual growing cycle, germinating in spring and blooming between summer and autumn.
The adult plant is toxic to livestock. It has a musty scent, a dark green color with bluish tinges and can reach a height of 10-75 cm / 4-28 inches. It branches and is often polymorphous in the different forms and subspecies. The culm is empty, angular and crooked, and its hairs have mutated into rough tubercles.
The flowers have white petals, held together by yellow cone-shaped stems, which bloom between June and October. The fruit is a green berry (it becomes black once it ripens) which contains many seeds; each plant can produce an average of 100-1,000 seeds that remain vital in the soil for many years and germinate progressively in spring. Dissemination is carried out by water, animals and by man.

## Environment:

It is a nitrogen loving species with a mesophile development that is found in all kinds of soils, more frequently in the cultivated fertile, acidic ones high in organic matter. It is very widespread, infesting vineyards, orchards and all the spring crops.

## Geographic distribution:

It is cosmopolite.

## Economic importance:

It causes moderate to considerable damage because of the space it takes up and the nitrogen it absorbs from the soil. It is a toxic plant.

## Control measures:

To effectively reduce this weed's development between the crop's rows, localized irrigation is recommended. Mulching on the rows with black plastic film is also suggested. The depth of hoeing operations should be limited to 4-5 cm / 1.5-2 inches to avoid bringing the seeds up to the surface.

# SETARIA VIRIDIS (L.) P.B.

## Growing cycle:

This grass has an annual cycle; it germinates at the beginning of spring and blooms from summer to the beginning of autumn. The adult plant grows in smooth, not-too-thick bushes and has a straight or semi-prostrate bearing caused by its bent culms. It reaches a height of about 30-50 cm / 12 to 20 inches or more. It is light green, with red-violet shades at node level, on the lower sheaths and on the inflorescence's bristles.
One plant can produce over a thousand seeds, which germinate in subsequent years during spring and summer.
Dissemination is carried out by water, humans and animals.

## Environment:

It is a warm season species that adapts to all kinds of soils, preferring those which are poor in lime, loose, sandy, warm and rich in nitrogen. It is often found on the edge of fields, in stubbles and along roads. It infests orchards, vineyards and meadows but also many summer crops such as hoed and horticultural ones.

## Geographic distribution:

Cosmopolite in the warm and temperate zones.

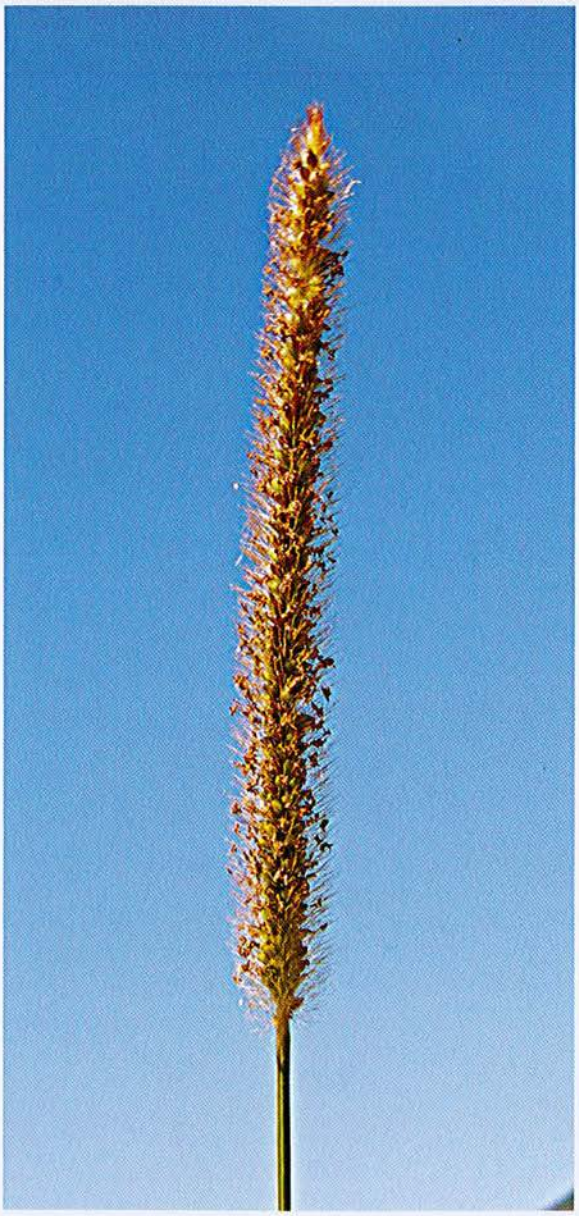
## Control Measures:

It is controlled similarly to the other annual grasses. Spreading may be preventively reduced by performing deep tillage between the rows (at least 20 cm / 8 inches deep).

*Common names:*
Green Foxtail
Green Bristle Grass
Bottle Grass
Green Millet
Wild Millet
Pigeongrass

# SETARIA GLAUCA (L.) P.B.

*Common names:*
Yellow Foxtail
Wild Millet
Yellow Bristlegrass



## Growing cycle:

It is an annual grass which germinates at the beginning of summer and blooms from summer to autumn. The adult plant has straight, hairless and rough culms pointing upwards. It grows in bushes up to 90 cm / 35 inches tall. It differs from the other Setaria species because of its larger size, different type of inflorescence, the hairless sheaths and the long hairs around the ligule.
Each plant produces up to 400-800 seeds, which germinate in subsequent years, during spring-summer, from a depth of about 0.5-1 cm / 0.2 to 0.4 inches. Disseminated by water, animals and man.

## Environment:

This species likes warm climates, fertile, irrigated, and loose soils which are rich in nitrogen. It is often found in fallow areas and along the ditches of fields; it can infest the hoed summer crops, as well as vineyards and orchards.

## Geographic distribution:

It is cosmopolite in the warm and temperate zones.

## Economic importance:

It uses nitrogen and takes up space, causing medium damage. It is sought out by sheep, and is cultivated in Southern Europe as a fodder plant.

## Control measures:

It is kept under control using the same methods as for the other annual grass species.

# RUMEX CRISPUS (L.)

## Growing cycle:

It is a perennial grass which can grow to a height of 120 cm / 47 inches, with a strong taproot and a straight, cylinder-shaped stem which is rising, striped, and full of branches. At maturity, the flowers take on a typical rust color. It germinates early, in spring or autumn, and flowers in late spring throughout the summer, depending on conditions. The flowers grow in dense verticils, and form a racemose ear. It is able to grow thousands of seeds in a pyramid form typical of many flowering plants in the knotweed family. It is disseminated by water, animals and by man. Beyond seed propagation, it is completely able to perpetuate itself over time thanks to shoots that form off of the collar. Its vegetative offshoots pass the winter in the form of a small rose, from which subsequently develop racemose flowers.

## Environment:

It can be found in fields, lawns and fodder crops up to the sub-alpine level. It prefers soils rich in nutrients and above all nitrogen. It tolerates heavy, compact and wet humid soils quite well. It prefers temperate and hot climates, as long as there is availability of water. In addition to the aforementioned meadows, it is often found in winter wheat fields where it is an "indicator" of soils with lime and/or clay, little drainage and excess water.

## Geographic distribution:

It is native to Eurasia, but for some time has become cosmopolite. It is in fact present in every agricultural ecosystem in temperate-hot areas throughout the world.

## Economic Importance:

Its greatest interference is due to strong root competition, and its ability to reduce quantities of water and nutrients available to crops. It should not be overlooked, though, that its erect plant structure

*Common names:*
Yellow Dock
Curly Dock
Sour Dock
Narrowleaf Dock

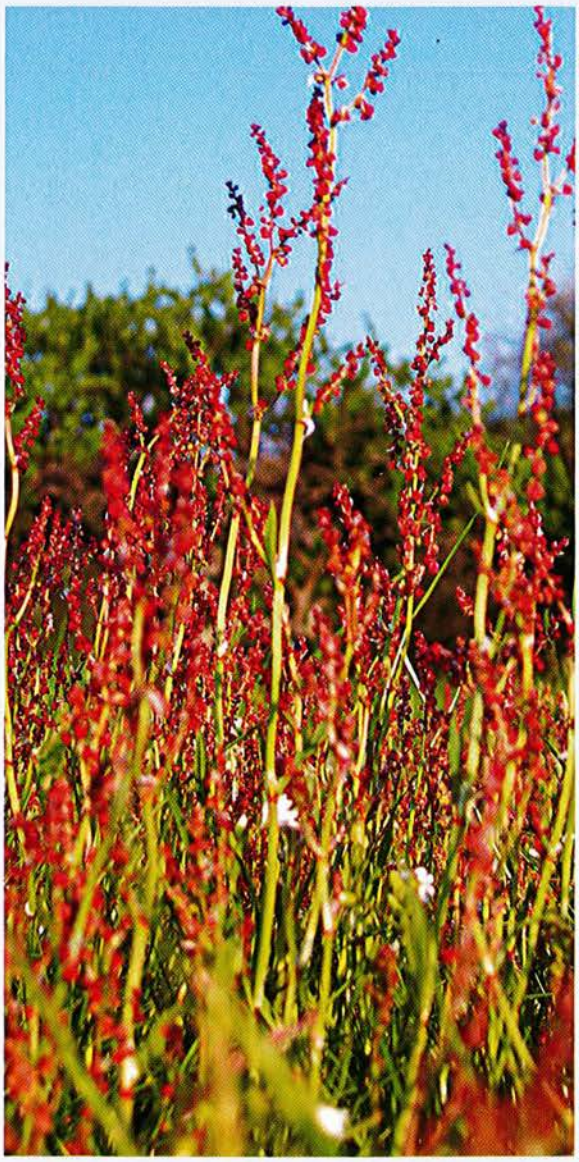
can also affect the soil surface microclimate by maintaining nocturnal humidity and blocking both sun and wind with its leaves.

## Control measures:

Post-emergent hormonal herbicides are used, alternating with pre-emergent treatment along the crop line. The spreading of glyphosate and/or glufosinate along the rows and control any missed treatments even if the dosage is directly proportional to the phenological state of the weed.

# RUMEX ACETOSELLA (L.)

*Common names:*
Sheep's Sorrel
Red Sorrel
Sour Weed
Field Sorrel



## Growing cycle:

It is a perennial plant with a straight stem, up to 80 cm / 31.5 inches long. It has a taproot that is generally branched, alternated, lanceolated leaves. It generally germinates in spring and blooms near summer time. Medium distance dissemination is carried out by grazing animals as well as by wind and man.

## Environment:

It grows in natural and sown meadows, on lean and sandy soils, which are silty and with acid pH. It prefers sunny and relatively hot areas. Its presence is indicative of lean, acidic and sandy soils.
Unlike Rumex acetosa, the leaves of R. acetosella are more bitter than acidic.

## Geographic distribution:

From Eurasia's cool and temperate regions, it has spread to Japan, South Africa, Greenland and North America.

## Economic importance:

It tends to spread out in acidic and sandy soils and take away space from other crops, while in lean and acidic mountain pastures it is often desired because it fills in spaces where nothing else grows.

## Control Measures:

Same as for R. Acetosa and R. Crispus.

# LOLIUM MULTIFLORUM (L.)

## Growing cycle:

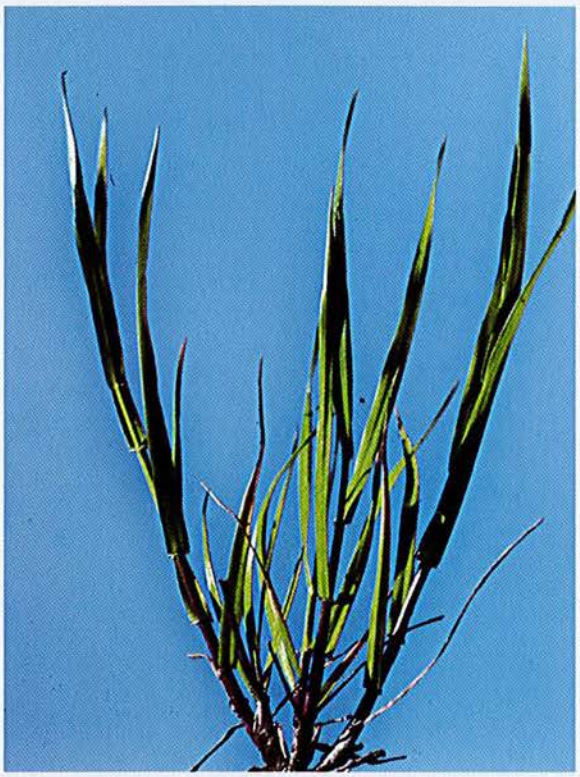
This plant has an annual cycle, but it may also be perennial; it usually germinates in spring and blooms in summer. The adult plant, dark, brilliant green, hairless, bushy and with an erect bearing, reaches a height of 50-120 cm / 20-47 inches, and is able to inbreed with *Lolium perenne*. Each plant produces up to 1,500 seeds that germinate between the autumn and spring of the next year. Dissemination is carried out by wind, water and also by man.

## Environment:

It is a nitrogen-loving species and a good forage grass; it is found in lawns and in irrigated fodder crop fields. It adapts to any type of soil, although it prefers those rich in nitrogen, limestone or clay. It can infest all kinds of crops, be they autumn-winter or spring-summer. In fruit orchards, and especially in vineyards, it is a widespread species in areas where the soil is not regularly turned over: a prolonged burial of the seeds tends, in fact, to strongly reduce its longevity. In vineyards, it interferes negatively only when it develops near the vine itself, while on the other hand it can be useful if it manifests itself between the rows, thanks to its anti-erosion abilities during rainy periods.

## Geographic Distribution:

Despite its Euro-Asian origins, it is already for some time dispersed throughout the agricultural areas of the world. Though it is present in Australia, the species L. Rigidum is more prevalent.



*Common names:*
Italian Rye grass

## Economic Importance:

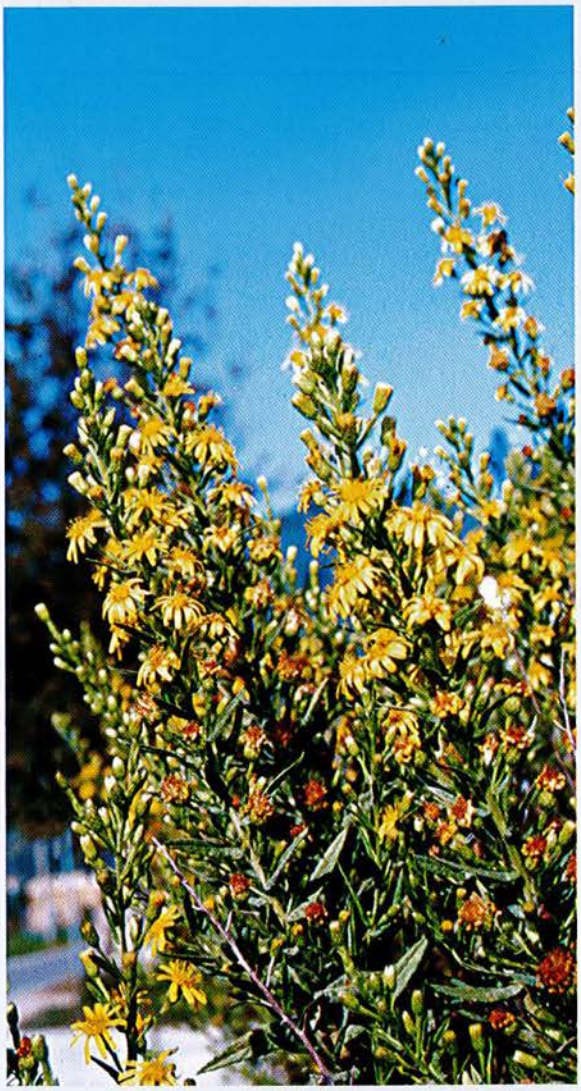
As already indicated, its negative impact is only when it grows close to the crop, where it becomes somewhat competitive (though barely or moderately) and allelopathic.

## Control Measures:

it is controlled with specific graminicides, or also with glyphosate, when the crops are dormant or specifically shielded. Because of its broad genetic base, herbicide-resistant bio-types can emerge and maintain those characteristics in their progeny.

# INULA VISCOSA (L.)

*Common names:*
Rock fleabane
Sticky Fleabane
Bitotu



## Growing cycle:

It is a perennial plant, as high as 150 cm / 5 feet, with an intense aroma, gland-shaped and sticky. It has a straight stem, woody at the base, simple or branched, densely covered with leaves.
The lower leaves are lanceolate and oblong, with a smooth edge or otherwise crenated; the higher leaves are vaginated.
Its inflorescence has many leaves shaped as a long pyramidal ear, with numerous heads; it measures about 1.5 cm / 0.6 inches in diameter; the petals are yellowish-orange; its ligulate corolla are yellow and 10-12 mm / 0.4-0.5 inches long; its bracts are clearly protruding. It blooms from August to November. The fruit is a hairy achene, suddenly pointed at the top, with hairs close to its base that form a blow ball.

## Environment:

One of the most noticeable plants of the Summer-Autumn season, it blooms abundantly in vineyards and fallow fields. It is one of the most widespread species, as it adapts to any kind of soil (it is a pioneer plant), though it prefers those that are loose and exposed to the sun.

## Geographic distribution:

The Mediterranean basin.

## Economic importance:

Thanks to its peculiar trait of being rustic and vigorous, it is used in environment-renewal projects, for the recovery of quarries, cliffs, etc.; it hosts insects which are useful in controlling the crop parasites.

## Control measures:

They are carried out with on-the-spot treatments using glyphosate after vine leaf fall. At the Castello Banfi estate, experimental tests have been made together with the University of Pisa in order to evaluate other possible control methods, considering the strong impact of this species.

# EQUISETUM ARVENSE (L.)

## Growing cycle:

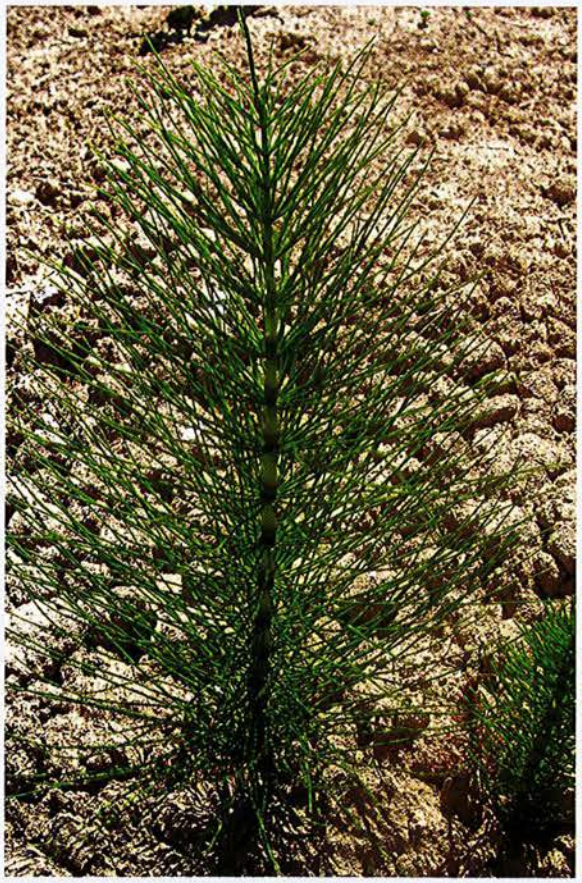
Perennial plant, it is considered a living fossil. It has no flowers, and reproduces through spores as well as asexually, differently from the phanerogams that have flowers and reproduce through seeds.
It multiplies with the help of branched rhizomes that go quite deep into the soil, sometimes forming small bulbs 5-10 mm / 0.2-0.4 inches in diameter.
The adult plant, up to 80 cm / 32 inches high and with an erect or semi-bending bearing, may resemble a small conifer or even horsehair, due to the decreasing size of its leaves starting from the bottom. It is more or less green, and feels rough because there is silica in small bulbs on the leaves' epidermis.
The stems that produce spores are the first to grow during spring, but quickly die; the next ones are sterile and last for the entire growing season.
The spores can reach great distances thanks to the wind and medium distances if carried by water, man or animals.

## Environment:

This species prefers soils that are sandy, silty, very humid and rich in nitrogen, but it adapts to all kinds of pH conditions (even though it prefers the lower ones) and to periods of modest drought, thanks to the impressive rhizome structure that is able to find water in the soil's deepest layers (on average 2 m / 6.5 feet deep, but even as deep as 6 m / 19.7 feet).
It infests winter cereals, hoed perennial crops such as orchards and vineyards, as well as fodder crops up to 2,000 m / 6,562 feet above sea level. It is dangerous for livestock because it contains poisonous alkaloids such as equisetina and palustrina, and because its tissues, rich in silica, can damage the animals' digestive system.

## Geographic distribution:

It can be found throughout the Earth's cold, temperate and warm climates, with the exception of the tropics.



*Common Names:*
Common horsetail
Field Horsetail
Horsetail Grass
Shave Grass

## Economic importance:

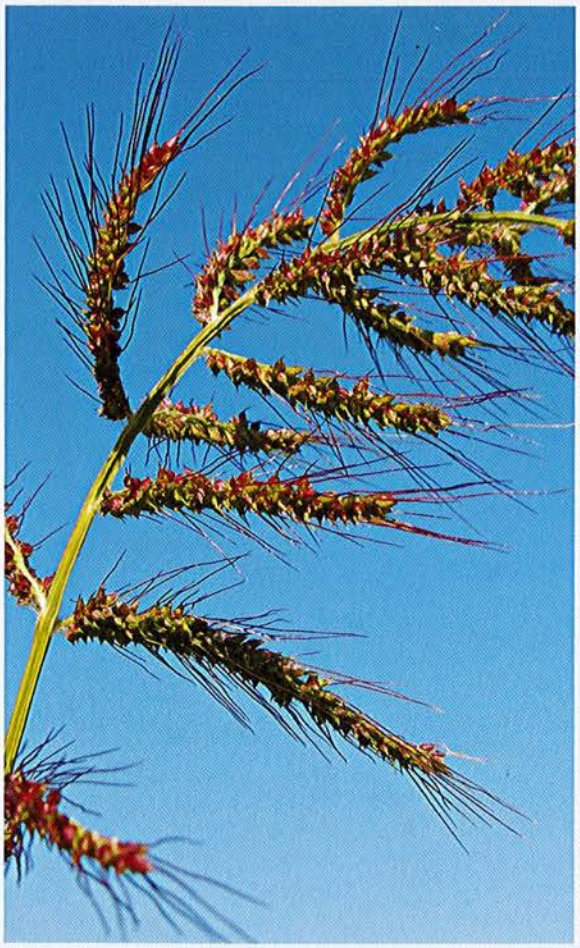
Often it takes away space from the ploughed and hoed crops and it uses up nitrogen; it has the tendency to expand massively, causing considerable damage.

## Control measures:

This weed is currently spreading as a result of reduction of deep mechanical tillage, breaking of the rhizomes with shallow harrowing, and the diminishing effectiveness of glyphosate. To limit its development, deep plowing and good drainage of the fields are the best methods. It can strongly reduce yields, due to its high water and nutrient competitiveness against crops, and due to the fact that it hosts fungi such as Rhizoctonia.

# ECHINOCHLOA CRUS-GALLI (L.) BEAUV.

*Common names:*
Barnyard grass
Cockspur
Japanese Millet
Watergrass



## Growing cycle:

Annual plant belonging to the graminaceous botanical family. It germinates in late spring/early summer and flowers at the end of summer, with minute rachis that make the ears appear to be curved. It has a bushy bearing, with vigorous culms that have small bunches of hair in the nodal region. Seed spreading is carried out by the wind, water and animals. Its successful survival rate is attributed to the elevated dormancy of its seeds as well as the prolific nature of a single plant. Each individual can produce hundreds of thousands of seeds under optimal conditions. It does not need determined periods of light; it can flower occasionally by "thermic summation" sufficient to achieve ideal levels of photosynthesis to generate seeds. Its caryopsis are united in small ears that can be more or less abundant, testimony to its extreme genetic variability.

## Environment:

It is difficult to specify a typical environment for this species, as it is a clear example of adaptability to various environmental conditions. Such a condition, called "environmental elasticity," allowed Echinochloa to colonize environments that are extremely diversified, both from a soil profile and an agricultural profile. It is, in fact, able to invade gardens and orchards farmed "dry" as well as rice paddies fully submerged. In any case, the ample genetic base of this species allows it to select the biotypes best adapted to persist in the various agro-ecological conditions. Its weak point is represented by its high need for light, as it is in the C4 photosynthetic cycle, needing elevated levels of light saturation and, as a result, does not tolerate shade.

## Geographic distribution:

Though of Euro-Asian origins, it is by now Cosmopolite in warm and temperate climates throughout the world.

## Economic importance:

This species, in addition to being very competitive, can result in an elevated grade of allelopathic interference.

## Control measures:

Other than specific graminicides, today several sulphonylureas are commercially available which can efficiently control this weed. The high temperatures required for seed germination often creates a sort of ecologic resistance to this species, as its emergence follows treatments in late spring/early summer with desiccants (glyphosate and/or ammonium glufosinate).

# DIGITARIA SANGUINALIS (L.) SCOP.

## Growing cycle:

It has an annual cycle, a curly and semi-bending bearing until the blooming season. Later, its numerous smooth, hairless, flexed culms cause it to have an upright bearing which can reach a height of 60 cm / 23.6 inches.
The raceme-shaped inflorescences are produced between July and October.
Each plant produces nearly 1,000 seeds that germinate superficially in the soil in mid-spring, maintaining their vigor for at least a decade.
Seed spreading is left to the wind, water, animals and also man.

## Environment:

It is a xerophilous species with a C4 photosynthetic efficiency; among the summer grasses, it is one of the least thermophyle, even though it can grow much faster with high temperatures. It prefers sunny, fertile, light, slightly acidic soils (from sandy to -silty sands), but also neutral and sub-alkaline, whereas it is rarely found in clayey and calcareous soils.
It grows in vineyards, orchards and low crops with a spring-summer cycle where it becomes very competitive and difficult to contain.

*Common names*
Large crabgrass
Digitaria

## Geographic distribution:

Cosmopolite.

## Economic importance:

It takes away nitrogen and space because of its wide bushes; it causes medium damage.

## Control measures:

It is not a species that requires great control measures. In addition to using the normal preventive measures, it is possible to control it directly with soil tillage, solarization or by using agrochemicals.

# CYNODON DACTYLON (L.) PERS.

*Common names:*
Gramigna
Common Gramigna
Bermudagrass

## Growing cycle:

An annual plant, it reproduces asexually via superficial stolons and branched rhizomes, which can be found in the soil up to 60 cm / 24 inches deep. The grown plant has a bending bearing; it sprawls outwards creating thick underground tangles of rhizomes and superficial branched stolon-formations. Its culms can reach a height of 20-40 cm / 8-16 inches. (it has short, light-colored scaly, internodes; the nodes are hairless) that lean over and flower from June to October. This plant produces few vital seeds, due to the frequent attacks of smut, which germinate at the end of spring only with high temperatures and humidity.

## Environment:

It is a thermophile species with a high photosynthetic efficiency (C4 plant); it can be found in all kinds of soils, even though it prefers those that are loose and dry, typical of the warmer, sub-tropical climates; it suggests the presence of sand. It infests all types of crops, especially at the edge of fields, but it can be particularly competitive against the perennial low crops (i.e. asparagus) and tree crops, such as vineyards, orchards and nurseries, especially where tillage is reduced.

## Geographic distribution:

Cosmopolite in warm climates, it is rarely found in temperate zones.

## Economic importance:

This weed takes up a lot of space with its rhizomes and stolons causing medium to great damage. There are many varieties, ideal for cropping in warm, dry regions, both as fodder and turf, due to their resistance to dry conditions and trampling.

## Control Measures:

Methods against this weed that attacks orchards and vineyards are based on the use of glyphosate and trimesium glyphosate. Preferred application time is onset of blooming or better yet, at the end of summer beginning of autumn, at the end of the growing cycle.
Preventive treatments that avoid its establishment in the fields control this weed better than the direct approach. Cleaning the working tools and equipment previously used in infested areas is a fundamental preventive operation. Moreover, it is paramount to remember that any kind of soil tillage that may break the weed's stolons helps it to spread.
A possible direct operation is deep plowing, which exposes the rhizomes to sun and air, causing their dehydration. This operation should be done in mid-summer, since the death of these organs requires high levels of dehydration. As an alternative, one may continuously cut the weeds' green parts (removing and burning the residues), until the reserves contained in the rhizomes have expired, thus making them unable to emit sprouts.

# CONYZA CANADENSIS (L.) CRONQ

## (SYNONYM: ERIGERON CANADENSIS L.)

### Growing cycle:

This species belongs to the asteraceae family. It is an annual plant with a blooming period that extends to various periods of the year but is generally concentrated in autumn and spring. It is erect and the stalk can even be over 1 meter / 3.3 feet high. It has numerous branches and each of them has many head-like inflorescences at the apex. The fertile flowers are light-colored (from white to yellow) tubular, hermaphrodite, and 100 to 200 of them can be found in each head. The fruit is a dry and dehiscent achene which is spread by the wind thanks to a blow-ball. The leaves are 5-10 cm / 2-4 inches long, alternate, caulinar, and lanceolate, with a short petiole. The basal leaves are gathered in a rosette. This is usually the phenologic stage in which this species typically passes the winter period. The blooming period is prolonged and lasts almost the entire summer (June-September). The plant's invasion strategy in the different ecosystems is based on its extraordinary ability to disseminate at great distances (several Km or miles) because of its light, feathery blow-balls. It is similar to the Conyza Bonariensis L (hairy horseweed or asthmaweed) from which it is distinguished primarily by the larger dimensions (>10 mm / .4 inches) of that species' flower heads.

### Environment:

The typical habitats are fallow fields or those under reduced or no-tillage, roadsides, sidewalks, and almost all the areas prone to dry soil conditions. Notwithstanding its widespread distribution, it prefers limey and sandy soils.

### Geographic distribution:

Originally from Northern America, it has now spread to all the regions with a Mediterranean climate and in the temperate and tropical areas of both the Old and New World.

*Common names:*
Horseweed
Mare's Tail

### Economic Importance:

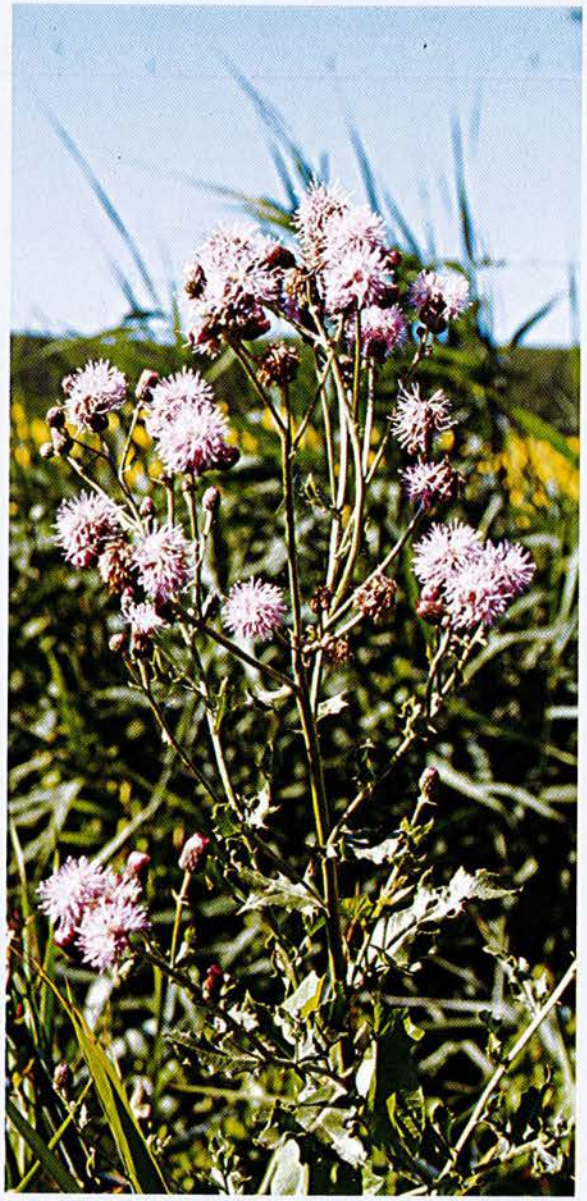
Though not traditionally a weed of relevant agricultural importance, this species is becoming a formidable infestant by virtue of its increased tendency to colonize quickly over vast areas that are dedicated to farming. Those primarily affected are soils whose layers are rarely or never turned over to expose lower layers. Its erect nature, together with the noteworthy height that it typically reaches, strongly interferes with agricultural operations including harvest, especially manual harvest.

### Control measures:

They are carried out with on-the-spot treatments using glyphosate after vine leaf fall. The infestations missed in this operation can be treated with the same product in late winter/early spring, before the vegetative cycle begins again.

# CIRSIUM ARVENSE (L.)

*Common names:*
Canada Thistle



## Growing cycle:

Perennial with very deep roots and underground rhizome stolons. It reproduces asexually via rhizomes, but also through seeds that are carried far from the mother plant by the wind. The grown plant, which is thorny and has branched and angular stems, has an average height of 50 to 150 cm / 1.6 to 5 feet.
It germinates in autumn, blooms between summer and autumn, and pollination is carried out by insects. Each plant produces an average of 2,000-5,000 seeds that remain vital in the soil for an undefined number of years. Seed spreading is carried out by wind, water and the plant itself.

## Environment:

It is a mesophyle pioneer species that can be found in all sorts of soils, though it prefers cool, fertile, deep, silty ones; it suggests the presence of nitrogen and silt.
Direct sunlight is particularly favorable to this plant's development which, in shady areas, produces few flowers.
It can be found in fallow areas and amidst grass and tree crops, it can become quite harmful during the autumn-spring cycle not only because of the competition for space and nutrients, but also because of allelopathic phenomena.

## Geographic distribution:

Eurasia, North Africa, North America.

## Control measures:

Systemic products on growing plants during spring and summer months. The most effective seem to be glyphosate and trimesium glyphosate, as use of the active ingredient with the most specific action (clopyralid) is not allowed on the vine. Applying hormonal products with a base of MCPA and dicamba is also a good containment method
Tillage that tends to break the rhizomes (rotary tillage and harrowing) must be avoided; to effectively reduce the rhizomes' vigor, instead, it is best to perform operations such as plowing and harrowing in summer, bringing rhizomes to the surface and thus exposing them to dry heat.
Weeding is effective only if performed several times in order to exhaust the rhizomes' regenerating capacity.

# CHENOPODIUM ALBUM (L.)

## Growing cycle:

It is an annual plant that germinates in spring or at the beginning of summer if the weather is warm; otherwise it usually germinates in summer or in autumn. The grown plants can reach 200 cm / 6.5 feet in height, the stem branches starting from the bottom, and is floury-white.
Because the seeds are hardly ever spread by the wind, it is common to find this species growing in patches; it is spread mainly by run-off water, animals, and sowing of non-pure seeds.

## Environment:

It attacks hoed summer crops, spring cereals, gardens and vineyards; it can also acquire ruderal characteristics. However, it prefers silty or sandy soils rich in nitrogen, and moderately warm, sunny areas, up to the sub-alpine level.

## Geographic distribution:

It is cosmopolite.

## Economic importance:

It is a fairly detrimental weed when it appears in great numbers; it can host numerous pests. In the past, it was used as a vegetable, and also to obtain a type of flour, which was harmful if eaten in great quantities.

## Control measures:

As a precaution, it is important to pay great attention to the purity of the seeds used. Active control of this species is easy by hoeing or using chemical herbicides; weed killing with fire or solarization are also effective.

*Common names:*
Lambsquarter
Pigweed
Wild spinach
Goosefoot

# CALYSTEGIA SEPIUM (L.) R.BR.

*Common names:*
Hedge bindweed

## Growing cycle:

It is an annual climbing plant with a winding stem that can grow up to 4 meters / 13 feet long. The leaves, alternate and sagittated, grow well apart, so that the most noticeable part of the plant is its flower.
The flowers are white, with large funnel-shaped corolla; they measure about 3-4 cm / 1.2-1.6 inches in diameter, bloom individually at the top of long stems that bend rightwards and they are scentless; they bloom between July and September.
As with other Convolvulae, flowers open when it is raining or the sky is covered, but often remain open during the night when they can be visited by large moths and a great number of other nocturnal insects.

## Environment:

It prefers clay dominated, humid soils, rich in nutrients. Its rapid growth enables this plant to live even in soils subject to seasonal floods, where it emerges late and blooms during August-September (for example, in reed thickets and in riparian scrubs).
It may also be found in areas inhabited by man, as well as in hedges. It has a heart shaped leaf that can be up to 15 cm / 6 inches long.

## Geographic distribution:

It is a very widespread, adaptable, and easily recognizable species, especially because of its great white funnel-shaped flowers.

## Economic importance:

Like the Convolvulus genus, Calystegia is chosen by bees for its nectar; its presence in honeys is of 0.64% (pollen poorly represented).

## Control measures:

It is hard to control because it has asexual reproductive organs and it is only sensitive to the active ingredients of a few herbicides. Because it can establish itself later, during the vine's full development phase, and the above-ground organs are vigorous, it may be even harder to control.

# AMARANTHUS RETROFLEXUS (L.)

*Common names:*
Common Amaranthus

## Growing cycle:

Annual plant that uses man or animals to spread seeds. It germinates from spring to summer, with relatively high temperatures and in the dark; blooming occurs from the end of summer to the end of fall.
The adult plant has an average height of 80-100 cm / 32-39 inches, ranging from 2 meters / 6.5 feet in the most fertile soils to a few centimeters/a couple of inches in unfavorable conditions; it has an erect bearing and branches from the base, resembling a shrub.
The flowers, unisexual, are bunched up in tight axillary and apical ears that bloom from May to October.
Each plant produces up to 1 million seeds, which remain vital in the soil for almost 20 years.

## Environment:

It prefers permeable and fertile soils from which it extracts a considerable amount of nutrients, and thrives on nitrogen; in fact, it is found most frequently on manured or sludged soils; it concentrates nitrates, causing it to intoxicate livestock.
It loves warm-humid climates (it is a C4 plant); it infests not only vineyards and orchards, but also hoed summer crops. It is highly competitive.

## Geographic distribution:

Cosmopolite, especially between 30°-60° latitude north.

## Control measures:

Useful preventive operations are: rotation, the use of mature manure in small amounts, and tillage that, by burying the seeds down deep, reduces their impact. Mulching with black plastic film enables reduction of this specie's spreading, although it can easily escape from the holes made to host the vine trunks.