

The application of plant growth regulator on landscape plant cultivation and maintenance management as well as the development trend

Plant growth regulator is a kind of substance that is synthesized artificially and has plant hormones activity, which will be sprayed from external part, be absorbed by plants, enter the plant body and can eventually adjust the growth and development of plants. It has small dosage, high efficiency and small residual toxicity, which is mainly used in adjusting plant type, improving resistance, increasing output, improving quality, regulating development process and controlling plant sex differentiation as well as has wide development and application prospect and is one of the most potential fields in modern agriculture in China.

Although plant growth regulator has already been widely used in modern agricultural production, it is still used a little in landscape plant cultivation and maintenance management. Especially in recent years, as the environmental pollution has gradually become serious and with the rapid development of urbanization, landscape has not only created beautiful and comfortable living environment for us, but also has become the important component in people's life and work. However, it will also cause huge difficulty and high cost in the landscape plant cultivation and maintenance management at the same time. Especially due to the unscientific transplanting and maintenance of some valuable tree species, lawn and flowers, it has caused huge loss for the enterprises. Therefore, it is the key to achieve sustainable development of urban garden greening by reducing the investment of manpower, financial

resources and material resources. On the basis of traditional landscape plant cultivation and maintenance management, plant growth regulator can improve the transplanting survival rate of plants and trees to the high limit, besides, it can rapidly promote outplanting and improve economic benefits as well as is also the only way to maintain good living environment, increase social and economic benefits and improve urban ecological environment.

The application effect of plant growth regulator on tree transplanting

Tree transplanting belongs to scientific technology, in which there will be various processes and complex technology. Therefore, we should carefully master the key points from digging to planting and maintenance so as to achieve double effects, thus it can not only ensure high tree transplanting survival rate, but also can save work, save time, save labour as well as reduce cost and improve efficiency. In tree transplanting process, by scientifically using rooting powder, antitranspirant and wound healing agent, it can rapidly repair tree wound, adjust the absorption and consumption balance between water and nutrient of trees after transplanting, shorten tree recovery time and rapidly restore tree vigour, thus it can avoid weak or death in a short period that caused by using traditional transplanting maintenance as well as reduce cost, achieve good benefit and avoid economic loss.



The application effect of plant growth regulator on seedling breeding

Breeding is the first step of plant production, which will occupy a decisive position in the production. Plant growth regulator will have very wide application in ornamental plant and forest tree propagation, which can not only improve traditional propagation technology, but also can solve some problems that are difficult to solve by using traditional technology, including breaking seed dormancy, promoting cutting rooting, regulating flowering and fruit setting and other applications. Especially in recent years, with the rapid development of grain for green project, seedling breeding has not only provided vital force for seedling resource of landscaping, but also has become the important means of acquiring wealth and driving social and economic benefits. In addition, it has become the most concerned topics of growers in finding the way to produce tall and sturdy and high resistance seedling within limited land and time. Especially due to the influence of environmental pollution and pest damage, it has become one of the keys for the sustainable development of seedling breeding industry to furthest play the

growth characteristics of seedling by using plant growth regulator and accelerate seedling breeding output-input ratio.

The application effect of plant growth regulator on lawn

Along with the prosperous development of turfgrass industry, the urban green area is also constantly expanding and developing, therefore, demand for high quality lawn is increasing accordingly. However, the planting and management of lawn will consume large amount of manpower, material resource and financial resource, especially the maintenance management in the later period including grass cutting and fertilization cost, will occupy a considerable proportion. Scholars from all over the world have made large amount of researches on how to reduce grass cutting frequency, reduce fertilizer application amount, reduce management cost, improve turf-establishment speed, extend lawn green period and improve seed production performance. Among them, research on regulating lawn growth by using plant growth regulator has achieved great progress. For example, by using plant growth retardants, it can inhibit the cell division of meristem in the active growth parts of turfgrass, thus it will delay the elongation growth of stem and tillering stem, dwarf turfgrass, replace artificial pruning, reduce pruning frequency and reduce lawn management cost; besides, it can also inhibit the vegetative growth of trifolium repens, shorten internode, thicken stem, increase chlorophyll content as well as dwarf and improve landscape; finally, it can improve turf quality, promote rooting and promote tillering as well as can enhance stress resistance, shade tolerance, cold resistance, drought resistance and disease resistance.

The application effect of plant growth regulator on flowers

In order to adapt to market demand and cater to festival need, it has become the important measures of flower production and maintenance management by controlling the flowering time of flowers as well as improving and extending the ornamental

value of landscape. Except for controlling temperature and light as well as taking the conventional gardening treatment measures including pruning, pinching and inflorescence bud removal, plant growth regulator can also be used in regulating flowering phase, thus it can increase the social economic benefit in peak tourist season. For example, gibberellin can replace light and low temperature condition and can promote flowering of various plants; auxin can inhibit the florescence of short-day plant, but it can promote the flowering of henbane and other long-day plants; cytokinin can promote the flowering of matthiola, pharbitis and other short-day plants; ethylene can effectively promote the flowering of bromeliad, but will promote or inhibit the flowering of other plants; abscisic acid can promote the flowering of some shot-day plants under long-day condition, but will inhibit the flowering of some long-day plants.

The application effect of plant growth regulator on garden maintenance management

In order to create beautiful landscape, we should consider the ecological adaptability unification between environment and plant as well as combine turfgrass, flowers, shrub, arbor and other plants, thus it can form scattered and organized artistic conception value. However, with the passage of time, season change and due to different growing environment, the morphology, color and posture of landscape plant will also differ a lot, therefore, maintenance management is necessary for plant landscape. For example, trimmer or pruning shears can be used in pruning and cutting leaves. However, this will damage plant tissue, thus plants will be easy to damage by pests, besides, plants will recover in a certain period and the landscape will be destroyed. For example, in order to adjust the growth vigor and maintain landscape, hedge, border tree and turfgrass will be trimmed frequently. However, by using prohexadione-calcium, CCC, MET and other plant growth retardants, it can delay the growth and development process of

plant when the dosage is properly controlled, thus it can extend the limitation period of landscape effect as well as can reduce trimming frequency and reduce plant disease and insect pests, meanwhile, it can greatly save manpower, financial resource and material resource and reduce environmental pollution that caused by controlling plant diseases and insect pests with pesticides.

The development trend and development prospect of plant growth regulator

In terms of development trend, the application effect of plant growth regulator on landscape plant cultivation and maintenance management is conspicuous, which is developing towards biopesticide, functional plant nutrients and other development directions, besides, the application range will be presented in the following prospects: a. it will be mixed with fertilizer and will be made into functional compound fertilizer or leaf fertilizer, for example, by mixing large amount of element fertilizer with plant growth retardants, it can improve color and luster of turfgrass, thus leaves will appear to be dark green, plant will become robust and can also improve density; b. it can be mixed with insecticide, fungicide and herbicide, which can not only improve pesticide effect, but also can improve landscape plant stress resistance and rapidly recover growth vigor; c. by mixed spraying various plant growth regulators, it can promote growth, dwarf plant as well as will have chemical finishing, chemical preservation and can delay senility. Therefore, we should use plant growth regulator based on local conditions as well as use the application of plant growth regulator on crops and other plants for reference so as to guide the application of plant growth regulator on landscape plant. In short, with the rapid development of modern gardening, the application of plant growth regulator on landscape plant cultivation and maintenance management will become wider and wider as well as will have more and more important effect in the future.