

# 唐菖蒲 (劍蘭) 栽培指南 (摘要)





唐菖蒲原是亞熱帶開花植物，  
可以很容易在露天田地中生長。  
成功開花的重要因素是：

- 1) 足夠的水分；
- 2) 足夠的日照；
- 3) 以及提供防霜保護（球莖以及植物均不能承受攝氏零度或以下的溫度）。

如果該植物在預期的開花期缺少水分或日照，就完全不會開花，不然就是花朵會變小，花型不好或完全停止開花。

● **缺水的原因有很多：**

供水有限；土壤品質；土壤溫度；氣溫；土壤中的鹽濃度pH；腐霉菌或其他感染根部的疾病。

● **缺少日照也可能有些原因：**

不利的天氣條件；每平方公尺種植的球莖過多；或球莖過小；球莖種植過深（與球莖大小和土壤條件有關）；唐菖蒲之間的雜草過多；以及在種植季節快速生長時日照突然減少。

GLADIOLUS was originally a sub-tropical flowering plant and can be easily grown in open field.

Factors important for successful flowering are:

- (1) enough water;
- (2) enough light; and
- (3) protection against frost (the corm, as well as the plant, do not resist temperatures of zero degrees Celsius or below).

If plants have a shortage of water or light during the expected flowering period, they will not flower at all, flowers will be smaller and less well-formed or will stop flowering altogether.

● **WATER SHORTAGE** can be due to many causes: limited water supply; soil quality; soil temperature; air temperature; salt concentration in the soil; and Pythium or other root- infecting diseases.

● **LIGHT SHORTAGE** can also have several causes: adverse weather conditions; too many corms planted per square meter; too small a corm size; corms planted too deep, (in relation to corm size and soil condition); too much weed between the gladioli; and sudden light reduction during growing season when plant growth is at its fastest.

收貨和保存

- 球莖以網袋包裝，置於塑料箱中運送。到貨後，請盡快開始種植。
- 前2-3週無需冷藏，將球莖放在通風良好的室內保持乾燥狀態，最好維持在攝氏17-20度間。
- 長期保存，冰庫應設定攝氏2-5度和低濕度環境。

RECEIPT & STORAGE

- Corms are packed in nets and shipped in plastic crates. On arrival, start planting as soon as possible.
- No cold storage is required for the first 2-3 weeks, with corms kept in dry conditions in a well-ventilated room, preferably at 17° - 20° Celsius.
- Longer term storage should be at 2-5 degrees Celsius at low- humidity levels.





## 球莖

- 球莖以其周長供貨，以公分（cm）為單位。至於切花產品，我們提供 6/8、8/10、10/12、12/14 和 14/+。
- 球莖大小是決定花卉品質的因素。較小的球莖適合最理想的氣候條件（適宜的溫度、增加的日照且沒有大雨）。當條件不太理想時，更適合種植較大尺寸的球莖。
- 選擇合適的球莖品種和尺寸大小極為重要，這取決於大約 70-80 天左右的預期生長條件。應考慮氣候、預期天氣條件和土壤類型等。唐菖蒲品種的特徵可以在我們的目錄和網站上找到：[www.stoopflowerbulb.nl](http://www.stoopflowerbulb.nl)

## 土壤類型

- 只要在乾早期時，土壤就能夠從地下水吸收足夠的水分，並且快速的排出多餘水分，唐菖蒲種植在大部分的土壤類型都可生長良好。
- 最好的土壤是濕潤且疏鬆的砂質土壤。
- 之前用於水稻栽培的土壤也適合種唐菖蒲。
- 比較溼潤的土壤也是可行的。
- 良好的排水很重要。

## 無雜草與無病原土壤

- 雜草控制最好在種植前幾個月開始，並可以在種植前六週用「年年春」（草甘膦）進行除草。種植後，在發芽之前，可以使用「理有龍」（LINURON）。
- 務必控管濕潤土壤上的雜草。唐菖蒲發芽冒出土壤後，就不能再使用化學除草劑。

## CORMS

- Corms are supplied on the basis of their circumference, as measured in centimeters (cm). For cut flower production we have available the sizes 6/8, 8/10 or 10/12, 12/14 and 14+.
- The corm size is a determining factor in the quality of the flower. Smaller sized corms are suited to the most ideal climate conditions (moderate temperatures, increasing light and no heavy rainfall). Larger sized corms are most suitable for planting when conditions are less optimal.
- It is vital to choose the right variety and size of corms, which is dependent on the expected growing conditions of around 70-80 days. The climate, expected weather conditions and soil type, etc., should be taken into consideration. Characteristics of gladioli varieties can be found in our catalogue and on our website: [www.stoopflowerbulb.nl](http://www.stoopflowerbulb.nl).

## SOIL TYPE

- Gladioli can be grown with good results on most soil types, as long as the soil absorbs enough moisture from the groundwater during dry periods and also allows excess water to drain off quickly enough.
- The best soil is moist and loose sandy loam.
- Soil previously used for wet rice cultivation is also suitable for gladioli.
- Heavy and moist clay-like soil is also workable.
- Good drainage is important.

## WEED-FREE & PATHOGEN-FREE SOIL

- Weed control should preferably start a few months before planting and can be controlled with ROUNDUP (glyphosate) six weeks prior to planting. Following planting, but before a shoot appears, LINURON can be used.
- Do use weed control on moist soil. After the gladiolus shoot emerges above the soil, the use of chemical weed control is no longer possible.

- 只可使用無病原土壤。如果之前的作物有問題，請不要再使用相同土壤。比如，如果之前的農作物（唐菖蒲、康乃馨、馬鈴薯等）與鐮孢菌、馬鈴薯黑痣病菌、腐霉菌或任何其他真菌出現問題，則必須使用特殊化學物質對土壤進行蒸氣消毒。確切化學藥品的使用取決於當地情況及其可行性。
- 腐霉菌通常是由無害和有害真菌與不同類型細菌之間的土壤平衡不足引起的。最好的解決方案是在耕種前使用至少六個月大的牛糞。反復多次灌水可以減少高鹽濃度引起的腐霉病。

## 土壤結構

- 確保土壤中的水和空氣之間保持適當平衡。
- 在種植前適當添加有機物可以改善土壤結構。例如：堆肥、樹葉、稻草、乾草或廐肥（來自牛而非雞）。
- 不可於黏質土壤上使用廐肥，因為會使土壤黏著度過高。

## 土壤酸度(鹼度)

- pH 值在 6-7 之間對於根部發育和吸收養分的潛力非常重要。
- 種植前持續添加有機物可以減少甚至排除酸鹼度問題。
- 建議至少在種植六週前做土壤取樣，以測定 pH 值、鹽濃度（EC < 1.0 mS / cm）、氯含量和養分含量，以便進行任何調整。

## 養分程度

- 不建議對唐菖蒲施用大量肥料，而是要持續提供足夠養分。鹽濃度過高會導致植株抗病性降低。

- Only use soil which is disease-free. If there has been a problem with a previous crop, do not use the same soil again. For example, if previous crops (gladioli, carnations, potatoes, etc.) had issues with Fusarium, Rhizoctonia, Pythium or any other fungus, the soil must be steamed or disinfected using a specific chemical. The exact chemical used is dependent on the localized situation as well as availability.
- Pythium is usually caused by an insufficient balance in the soil between harmless and harmful fungus and different types of bacteria. The best solution is to use cow manure that is at least six months old before cultivation. Pythium, caused by high salt concentration, can be reduced with irrigation water repeated several times.

## SOIL STRUCTURE

- Ensure a proper balance between water and air in the soil.
- Soil structure can be improved by adding organic matter well in advance of planting. Examples: compost, leaves, straw, hay or stable manure (from cows not chickens).
- Do not use stable manure with heavy soils as this makes the soil too sticky.

## SOIL ACIDITY (ALKALINITY)

- A pH level between 6 - 7 is essential for root development and the potential to absorb nutrients.
- Consistently adding organic matter in advance of planting can reduce, or even eliminate, acid or alkalinity problems.
- Taking a soil sample at least six weeks prior to planting is a recommended way to determine pH, salt concentration (EC < 1.0 mS/cm), chlorine content and the presence of nutrients, so that any adjustments can be made.

## NUTRITION LEVELS

- Gladioli do not benefit from a heavy application of fertilizer but from the consistent availability of sufficient nutrients instead. To do otherwise is ill-advised due to the risk of excessively high



- 如有必要，請使用氮磷鉀 2：2：3 比例的無氟化學肥料。
- 肥料的使用要求取決於氣候和土壤條件。不建議在長出第五片葉子之前施用肥料，因為這會破壞花朵並導致植株停止開花，尤其是在溫度高和濕度低的情況下。長出第五片葉子後，可以利用一些硝酸鹽來強化花穗。在此階段最好用液態肥料，因為會立即被植株吸收。
- 種植前務必做土壤取樣，以便依據提供給予施肥。

## 唐菖蒲的生根

- 土壤溫度在攝氏 12-18 度之間時，唐菖蒲球莖生根效果最好。種植前應先澆幾次水，以避免土壤溫度過高。如果土壤溫度較高，則球莖會長出嫩芽而根部小。這將大大影響最後的開花期，因為沒有好的根部，就不可能有高品質的花卉。
- 當溫度為攝氏 35 度或更高時，使用（最好是白色的）遮陰網（50% 白色遮陰網）將有助於冷卻土壤。長出兩片葉子後，應除去遮陰網，在植株出現五片葉子後才應放回。

## 種植地點

- 露天開放性田地，應遠離樹木或建築物，避免於陰影下和蟲子或其他昆蟲從樹枝上掉下來。
- 種植於海拔於 500-1,500 公尺之間很理想。
- 低地地區也是合適的。
- 種植區域應盡可能平坦。

salt concentrations and a lowering of disease-resistance.

- If necessary, use a chemical fertilizer with NPK composition 2:2:3, or 10:10 :10 without Fluor.
- Fertilizer application requirements depend on climate and soil conditions. It is not advisable to apply fertilizers before the fifth leaf of the plant appears, as this can disrupt the flower and cause the plant to stop flowering, especially if the temperature is high and humidity low. Upon emerging of the fifth leaf, some nitrates can be applied to enlarge the flower-spike. Liquid fertilizer is preferred at this stage, as it is immediately absorbed by the plant.
- Always take a soil sample before planting so that fertilizer can be applied according to the recommendations provided.

## ROOTING OF GLADIOLI

- The rooting of gladioli corms is best at soil temperatures of between 12-18 degrees Celsius. Avoid higher soil temperatures by watering the soil several times before planting. If the soil temperature is higher, the corms will grow a shoot and less roots. This hugely influences the final flowering stage, as without good roots a high-quality flower is impossible.
- When temperatures are 35 degrees Celsius or higher, using (preferably white) shadow nets (50% white shadow net) will help cool down the soil. After two leaves have appeared, the shadow nets should be removed and only be replaced when a plant has five leaves.

## PLANTING LOCATIONS

- Open fields, far from trees or buildings, avoiding shady areas and lice or other insects falling from branches.
- Planting areas at high elevations of between 500 - 1,500 meters are ideal.
- Lower land areas are also suitable.
- The planting area should be as flat as possible.



耕種地區使用(黑色)遮陰網

Planting location using (black) shadow nets



耕種地區使用(白色)遮陰網(50% 白色遮陰網)

Planting location using (white) shadow nets (50% white shadow net)



## 種植時間

- 唐菖蒲球莖的最佳種植時間是在土壤涼爽、可以提供足夠水份且日照強度增加時。
- 只要有足夠水份且土壤質地適合耕作，也可在其他季節種植。
- 雨季也可播種，並在上方安裝無側邊遮蔽物以確保植株或多或少保持乾燥。應使用更大尺寸的球莖（10-12公分），因為此時日照強度也較低。

## 種植

- 將球莖種植在足夠濕潤但不過度潮濕的土壤中。種植前幾天要灌溉土壤。
- 若種植後土壤不夠濕潤，請在種植後的最初幾週進行灌溉，以免在發育階段出現問題。
- 若土壤過於潮濕，應延期播種，直到浸水較少，以防止破壞土壤結構。



## PLANTING TIME

- The best time to plant gladioli corms in Japan is during spring. During this time, the soil is cool, there is sufficient water and light intensity is increasing.
- Planting in other seasons is also possible, as long as there is sufficient water and soil texture suitable for tillage.
- Planting during the rainy season is also possible with the erection of a side-less covering above to ensure plants remain more or less dry. Bigger sized corms (10-12 cm) should be used as light intensity is lower at this time too.

## PLANTING

- Plant corms in soil that is sufficiently moist, but not overly wet. Irrigate the soil a few days before planting.
- If the soil is not moist enough after planting, irrigate to avoid problems during the development stage in the first weeks after planting.
- If the soil is too wet, postpone planting until it is less water-logged to prevent damage to the soil structure.

## 種植技術

- 球莖可種植於高平型苗床或山脊型苗床上，以自然降雨補充水份。球莖不能種植得過深，5 公分的深度就已足夠。之後還可以覆土增加土壤高度。
- 使用稻草、松針等製成的覆蓋物可以幫助控制土壤溫度，並在炎熱的天氣下保持土壤涼爽。

## 種植密度

- 種植密度取決於球莖大小和氣候。  
每平方公尺種植：  
30 個球莖（1000平方公尺= 30,000 個球莖）。  
每種植一公尺：25 個球莖。  
每個球莖之間的空間：4-5 公分。  
一排的總寬度為 75 公分  
（包括30公分的走道寬度）。  
播種深度：土壤平面高於球莖頂部 5 公分  
（在生長期可以增加深度）。

## PLANTING TECHNIQUES

- Corms can be planted on raised beds or ridges to supplement natural rainfall. In Indonesia, corms should not be planted too deep; A planting depth of 5 cm is sufficient. More soil can be added later.
- Applying a mulch of composed straw, pine needles, etc. could help control soil temperature, keeping soil cooler during warmer weather.

## PLANTING DENSITY

- Planting density depends on corm size and climate. Planting per square meter: 30 corms (1000 m<sup>2</sup> = 30,000 corms). Per planted meter: 25 corms. Space between each corm: 4-5 cm. One row is 75 cm in total width (which includes 30 cm path width). Planting depth: 5 cm soil on top of the corms (more can be added during the growing period).

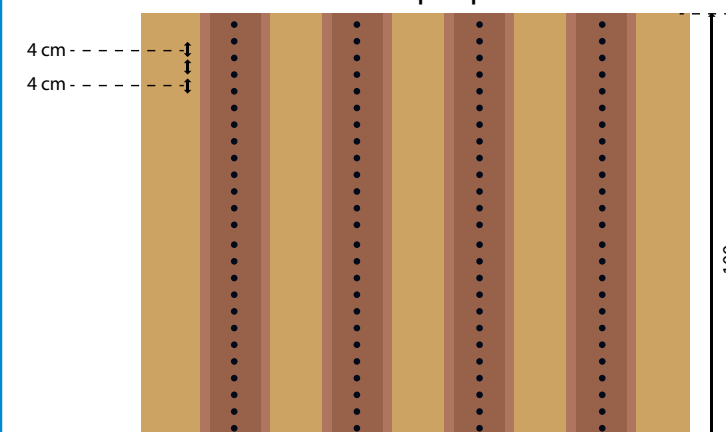
## 種植密度

## PLANTING DENSITY LAYOUT CHARTS



### 每公尺總種植 25 球莖

Around 25 corms per planted meter



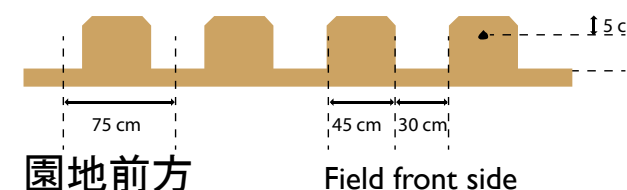
一平方公尺 = 100公分 x 100公分  
1 m<sup>2</sup> = 100 cm x 100 cm

球莖之間距離 = 4 - 5 公分  
Space between corms = 4 - 5 cm.  
無論球莖大小，都保持4-5公分的空間。  
The 4 - 5 cm space remains the same regardless of the corm size.

排：寬度 75 公分（包括寬度 30 公分的走道）  
Row = 75 cm in width (includes 30 cm path)

種植深度=土壤高於球莖 5 公分  
Planting depth = 5 cm soil above the corm.

之後於栽培期間，可在植物兩側添加土壤。  
Later on, during cultivation, soil can be added on both sides of the plant.



園地前方

Field front side



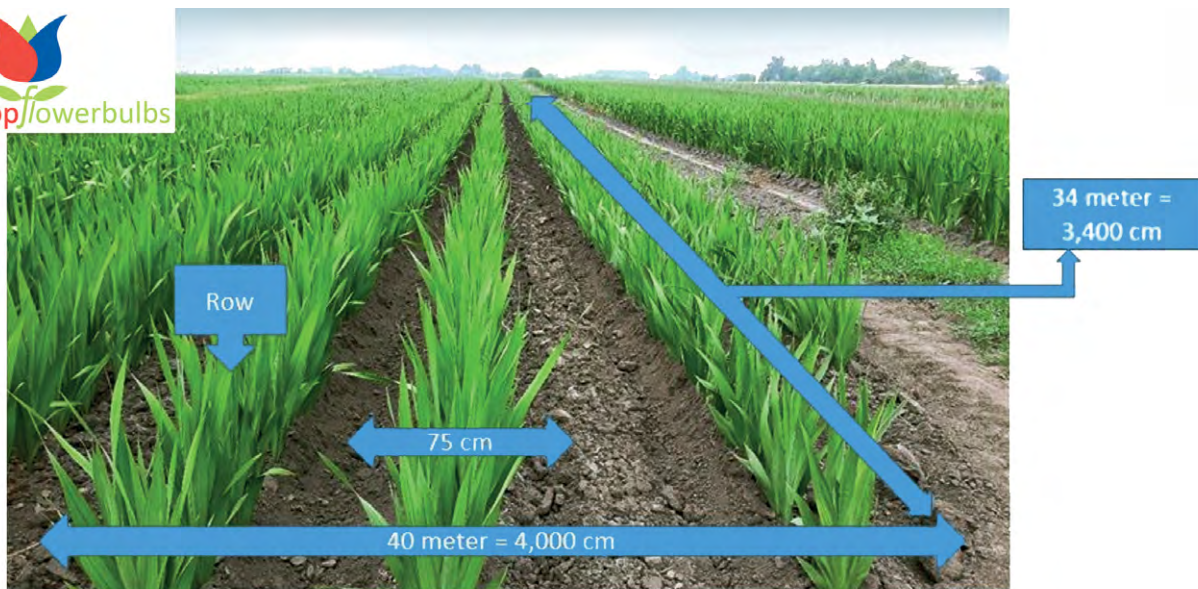


### 例 1: 在 40x25 公尺的田地可種植多少顆球莖?

1. 計算適合該田地的排數。  
一排 (包括 30 公分寬走道) 的寬度為 75 公分。  
將 4,000 公分 (寬度) 除以 75 公分 = 53 排。
2. 53 排 x 25 公尺 = 1,325 公尺種植空間。
3. 這規則是每公尺種 25 顆 (球莖間距 4 - 5 公分)
4. 1,325 公尺的種植空間 x 25 球莖 =  
**33,125 顆球莖**

### Example 1: How many corms can be planted in a 40 x 25 meter field?

1. Calculations of how many rows fit the field:  
One row (including path 30 cm) is 75 cm in width.  
Divide 4,000 cm (width) by 75 cm width = 53 rows
2. 53 rows x 25 meter = 1,325 meter of planting space.
3. The rule is 25 corms per planted meter (space between corms = 4 - 5 cm)
4. 1,325 meter planting space x 25 corms =  
**33,125 corms**

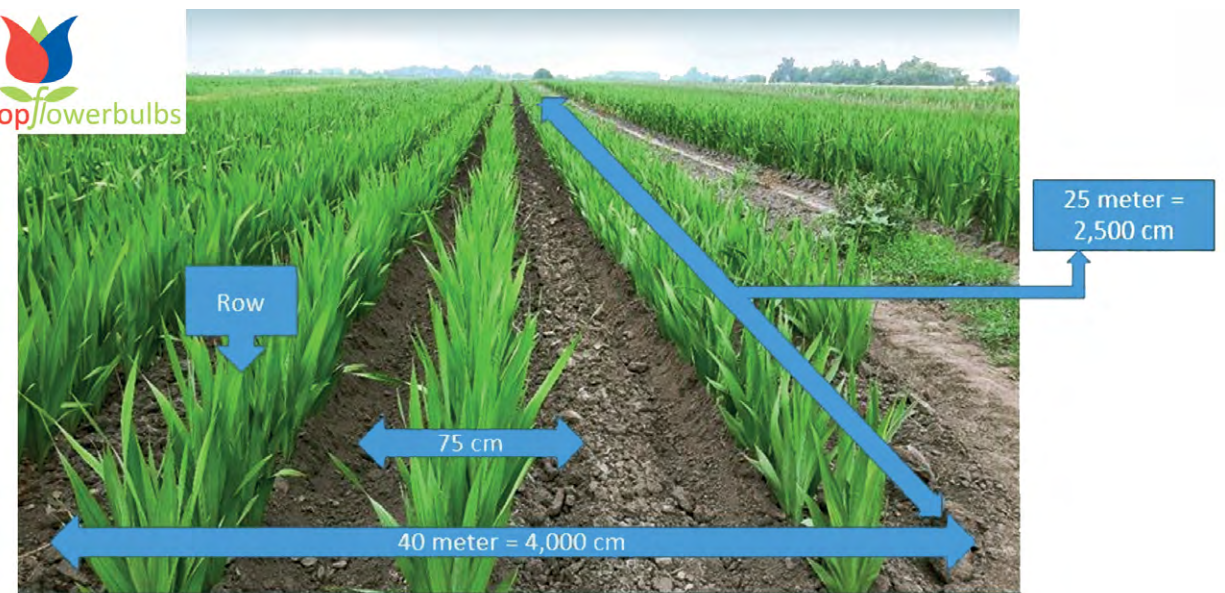


### 例 2: 種植 10,000 顆球莖需要多大的田地?

1. 計算需要多少平方公尺:  
1 平方公尺可種植 30 顆球莖。  
用 1 平方公尺除以 30 個球莖 = 0,333333 平方公尺, 再乘以 10,000 顆球莖。  
結果為 334 平方公尺。
2. 計算田地大小: 需要的田地大小, 例如  
10 公尺 x 34 公尺 = 340 平方公尺;  
或 8 公尺 x 42 公尺 = 336 平方公尺

### Example 2: What is the required field size to plant 10,000 corms?

1. Calculation how many m<sup>2</sup> is needed:  
30 corms can be planted on 1 m<sup>2</sup>.  
Divide 1 m<sup>2</sup> by 30 corms = 0,03333 m<sup>2</sup>, and multiply by 10,000 corms. The result = 334 m<sup>2</sup>
2. Calculation of the field's size:  
required is a field of, for example  
10 m x 34 m = 340 m<sup>2</sup>.  
Or 8 m by 42 m = 336 m<sup>2</sup>



### 例 3: 每排/田地要多少顆球莖?

1. 一塊寬 40 公尺, 長 25 公尺的田地總計 = 1,000 平方公尺。
2. 每排 (包括 30 公分的走道) 的總寬度為 75 公分, 因此該空間可以容納 53 排。  
(2,500 公分 : 75 公分)。  
每排長 2500 公分, 每顆球莖需 4 - 5 公分的空間。
3. 將 2500 公分長除以 4.5 公分 (球莖之間空間) = 大約每排種植 555 顆球莖。
4. 555 顆球莖 x 53 排 = 29,415 顆球莖。

### Example 3: How many corms per row/field?

1. A field 40 m wide and 25 meter long = 1,000 m<sup>2</sup> in total.
2. Each row (including 30 cm path) is 75 cm wide in total, therefore 53 rows can fit in this space (2500 cm : 75 cm).  
Each row is 2,500 cm long and each corm needs 4 - 5 cm space
3. Divide 2,500 cm length by 4,5 cm (space between corms) = approx. 555 corms planted per 1 row
4. 555 corms x 53 rows = 29,415 corms

## 農藥、殺菌劑與除草劑

- 如今, 有許多傳統的農藥、殺菌劑和除草劑不准使用。這鼓勵使用更積極的做法, 植物健康於在生長時期較少依賴化學療法。  
在可能的情況下, Stoop 我們始終鼓勵使用生物控制和病蟲害綜合治理方法。

## PESTICIDES, FUNGICIDES & HERBICIDES

- Nowadays, the use of many traditional pesticides, fungicides and herbicides is not permitted. This encourages a more proactive approach, so plant health during the growing stage is less dependent on chemical treatments.  
Wherever possible, Stoop always encourages the use of biological control and integrated pest management practices.



## 唐菖蒲病害與損害

## GLADIOLI DISEASES & DAMAGE

### 1. 細菌

唐菖蒲伯克氏菌；可能成為問題的病害，尤其是在天氣溫暖和降雨多的潮濕條件下。感染會嚴重損害農作物，特別是於高密度種植。



### 1. BACTERIA

*Burkholderia gladioli*; a disease that can become a problem, particularly during humid conditions where the weather is warm and rainfall is high. Infection results in major crop damage, particularly among high-density planting.

#### Identification:

#### 辨別方法:

- 葉子突然變成灰色，外層葉子與下面的葉子組織分離，使得葉片容易可於縱向撕開。在土壤上發病，可以迅速擴散到周圍健康的植株。

- The leaves suddenly turn grey and the outer leaf layer separates from the leaf tissue beneath. This makes the leaf tear open easily in a lengthwise direction. The disease develops above soil level and can quickly spread to healthy surrounding plants.

### 預防與控制措施

#### 改善種植條件

當這些細菌感染農作物時，幾乎不可能控制。有證據表示，如果進行土壤消毒來預防腐霉病（Amistar = 亞托敏），則農作物會對細菌有更大的抵抗力。這些細菌攻擊的主要原因是由於植栽虛弱，與人類免疫系統受到破壞時極有可能受到細菌感染的危險一樣。

#### 唐菖蒲的虛弱可能是由於以下幾種原因:

- 土壤中的腐霉（鹽）。
- 多年種植同一作物以及在同一土地上多年種植唐菖蒲都增加了細菌感染的機會。根部乾枯。
- 黏性高，不透氣的土壤。
- 因此，重要的第一步是確保適當的生長條件。

#### 植物加強保護措施

控制細菌感染的第二步，是在植株初感染時或預計將要發生感染時，馬上給予植株保護。細菌喜歡高濕度和高於攝氏20度的環境。使用

### Measures for prevention & control:

#### Improving Growing Conditions.

When these bacteria infect crops it is nearly impossible to control. Evidence shows that if soil is disinfected against *Pythium* (Amistar = azoxystrobin) as a preventative measure, the crop has greater resistance against the bacteria. The main reason these bacteria attack, is because of plant weakness, in much the same way that humans are at risk of bacterial infection when their immune systems are compromised.

Weakness in gladioli can be due to several causes:

- *Pythium* (salt) in the soil.
  - Cultivation of the same crop for many years as well as growing gladioli for many years on the same land increases the chances of bacterial infection.
  - Drying out of the roots.
  - Heavy, ill-ventilated soil.
- Consequently, the important first step is to ensure proper growing conditions.

#### Plant Reinforcement.

The second step to controlling bacterial infection is to support plants once when they have become infected, or at the moment when infection is expected to strike. Bacteria prefer conditions with

灑水器澆水可能導致高濕度，因此最好選擇滴灌。有幾種肥料可以加強植物的養分，例如 Megafol、Quinosol 和 Serenade 殺菌劑。只需每10天使用一次。這三種都是使用天然成分製成。

### 化學殺菌劑

許多國家已正式禁止使用化學殺菌劑，因此即使可以使用，我們也建議不要使用。無論如何，它們只能在有限時間內提供幫助，主要是因為根本無法徹底消滅細菌。細菌會被銅（Cu）殺死，但這會損害唐菖蒲的生長速度，並對開花期也產生不良影響，使用化學殺菌劑 Kasumin 也會有上述的影響。

high humidity and temperatures higher than 20 ° Celsius. High humidity can be caused by watering with sprinklers, therefore drip irrigation is preferred. Several fertilizers reinforce plants, such as Megafol, Quinosol and Serenade. Use them only once per 10 days. All three are formulated using natural ingredients.

### Bacteria-Killing Chemicals.

In many countries, official bacteria-killing chemicals are already forbidden, therefore even if they are permitted, it is advisable not to use them. They only help for a limited time anyway, primarily because the underlying cause of the bacteria has not been removed. Bacteria are killed by copper (Cu), but this harms the growing speed of gladioli and adversely affects flowering too, as does the chemical Kasumin.

## 2. 植原體(原核致病菌)

植原體是葉蟬傳播的病原體。

### 辨別方法:

多芽的植株（芽點分化太多）是被附近已感染的植物傳染到球莖發生的。這些植株不會發育成正常的開花型態。在健康的作物中，葉蟬可能傳播植原體到乾淨的球莖中。在初期感染時，植株的內葉黃化並過早死亡，然而外葉仍保持綠色。在這種情況下，植物將不會開花，如果後期被感染，則通常會有畸形花。



Plants with a variety of small shoots (bushy plants) are produced from corms infected by recently infected plants. These plants do not develop into normal flowering specimens. In a healthy crop, with clean corms, leafhoppers can transmit Phytoplasmas. In an early infection the inner leaves of plants turn yellow and die prematurely whilst the outer leaves remain green. In this circumstance the plant will produce no flowers, whereas if infected later flowers will not usually be well-formed.

## 2. PHYTOPLASMA

Phytoplasmas are pathogens transmitted by leafhoppers.

### Identification:

### 預防與控制措施

使用安全殺蟲劑可有效控制帶有這些病原體的昆蟲。

### Measures for prevention & control:

Use approved insecticides that are effective at controlling these pathogen-carrying insects.



### 3. 唐菖蒲灰黴病

灰黴病可能會感染唐菖蒲的球莖、葉子和花朵。菌核可在植物所有部位上形成，包括球莖。在潮濕條件下，這種真菌會在地面上產生大量孢子，這些孢子會隨風散佈。於地底下型成的菌核很大，呈黑色且平坦，大小在1至9毫米之間。

在過度潮濕的條件下，冷藏庫中的球莖和已採收的花梗都可能受到感染。葉子和莖部的感染會發生在低溫（大約攝氏10度）和潮濕的條件下。如果植株受潮的時間過長，感染會擴散到其他葉子。這種病通常發生在種植密度過高的球莖作物上，以及相對濕度（RH）過高的無通風溫室。

#### 辨別方法：

通常一開始的症狀（濕且呈褐色的腐爛葉子組織）出現在植株頸部的土壤表面。植株開始黃化，有時會垂下來。在變成深褐色之前，葉片上會出現圓形的淺棕色斑點。在之後的階段，葉面組織上會出現大塊灰棕色斑點。在潮濕的天氣中，灰色的真菌緯線出現在受感染的斑點上。發芽的孢子也可能感染花朵，導致無色，水浸的斑點。花朵最後變成棕色且爛爛的。

#### 預防與控制措施：

球莖到貨後儘快種植。  
如果需要存放，請保存於相對濕度低並提供良好通風的環境。  
遵循良好的循環耕作程序。  
取出所有損壞和感染的球莖。  
不要種植得太過密集，以保持作物乾燥。  
種植在台架上可確保植物增加通風性，從而確



### 3. BOTRYTIS GLADIOLORUM

*Botrytis gladiolorum* can infect the corms, leaves and flowers of gladioli. Sclerotia can form on all parts of the plant, including the corm. Under damp conditions, this fungus produces masses of spores above ground that are dispersed by the wind.

The sclerotia formed underground are large, black and flat, ranging in size from 1-9 millimeters. Under excessively damp conditions, corms and harvested products in cold stores

can become infected.

The infection of leaves and stems occurs at cool temperatures (approximately 10 ° Celsius) and under damp conditions. If the plant remains wet for too long, the infection spreads to other leaves. This disease often occurs in crops in which corms have been planted too closely together, as well as in unventilated greenhouses where the relative humidity (RH) reaches excessively high levels.

#### Identification:

Often the first symptoms (wet and brown decaying leaf tissue), appear on the neck of the plant at the surface-level of the soil. The plant turns yellow and sometimes falls over. Round, light-brown spots appear on the leaves before turning dark brown. At a later stage, large, grey-brown spots develop on the leaf tissue. During wet weather, a grey fungal web appears on infected spots. Germinating spores can also infect flowers, resulting in colorless, water-soaked spots. The flower ultimately turns brown and slimy.

#### Measures for prevention & control:

Plant corms as soon as possible after delivery. If storage is required, keep relatively humidity low and provide good ventilation.  
Follow a good crop rotation program.  
Remove all damaged and infected corms.  
Keep the crop dry by not planting too closely together.

保降雨後更快地變乾燥。早上澆水，使農作物在晚上之前變乾。

如有必要，使用安全的殺菌劑噴灑農作物，該殺菌劑可有效控制灰黴菌。

另外，在噴灑時，請確保將藥劑塗在葉子兩側。移除受感染的植物及其球莖。

- 保持土壤乾淨，清除先前種植的雜草和殘留物。
  - 如果預測會下雨，則每平方公尺要種植較少的球莖（大約每平方公尺30顆球莖）。
  - 除非有妥善管理，否則每年最好不要在同一土壤種植。
  - 照料好土壤的排水，因為唐菖蒲不喜歡「根部潮濕」。
  - 種植在露天田地，不要有樹木或其他大型造成遮陰的物件。
  - 利用網子（或繩子）種植，以免植株被風吹倒。
  - 在唐菖蒲周圍保持2公尺周長，而且沒有其他植物和雜草。
  - 在雨季噴灑殺菌劑，使用下列殺菌劑中任何之一噴灑：白克列 (Boscalid)、鋅錳乃浦 (Mancozeb)、百菌清 (Chlorothalonil)、撲克拉 (Prochloraz)、扶吉胺 (Fluazinam)、克收欣 (Kresoxim-methyl)、錳乃浦 (Maneb)、得克利 (Tebuconazole) 和三氟敏 (Trifloxystrobin)。
- 施用殺菌劑時，葉子應乾燥，而且至少在噴灑3小時後保持乾燥。

### 4. 霜害

在高海拔地區，涼爽的季節有時會發生低溫甚至結霜。長時間處於低溫下的球莖其表面會出現水泡，之後會變成薄片。在嚴重的情況下，球莖會變成棕色，球莖組織會軟化而且變得不透明。

Planting on rigs ensures increased ventilation between the plants, ensuring they dry-off faster after rainfall.

Water in the morning so that crops can dry-off before evening. If necessary, spray crops with an approved fungicide that is effective towards controlling Botrytis.

Also, make sure when spraying that the agent is applied to both sides of the leaves.

Remove infected plants along with their corms.

- Keep soil clean from weeds and residuals from previous cultivations.
- Plant fewer corms per m2 if rainy weather is expected (around 30 bulbs/m2 is suitable).
- Unless properly managed, one should preferably not plant on the same soil every year.
- Look after soil drainage, as gladioli do not like "wet feet".
- Plant in open fields, without trees or other large objects that create shade.
- Plant in nets, (or with ropes), to avoid plants falling down in the wind.
- Keep a perimeter of 2 meters around the gladioli clear and free from plants and weeds.
- Spray plants during rainy periods, alternately with one of the following fungicides: Boscalid, Mancozeb, Chlorothalonil, Prochloraz, Fluazinam, Kresoxim-methyl, Maneb, Tebuconazole and Trifloxystrobin. When applying fungicides, leaves should be dry and remain dry after spraying for at least another 3 hours.

### 4. FROST DAMAGE

At higher elevations, low temperatures and even frost sometimes occurs during the cool season. Corms exposed to cold temperatures for too long exhibit blisters on the surface of the corm that can later become flakes. In severe cases, the corm turns brown and the corm tissue softens and becomes less opaque..



## 5. 花穗畸形

### 辨別方法：

在世界許多地方發現花穗以很多不同的形態變型。穗狀花序的某些部位一起生長，花苞畸形或兩朵黏在一起。



## 5. DEFORMED SPIKES

### Identification:

Plants with deformed spikes can be found in many parts of the world and in many forms. Parts of the spike grow together, become deformed or double-up.

### 預防與控制措施：

畸形花是在第二和第五片葉子之間的花朵成形時發生。如果在那個時期有病毒或植原體感染了植株，就會影響花朵的形成。植株在開花時，會出現變形的花朵。病毒和植原體可以透過昆蟲和線蟲帶原，將病原粒子從某植株轉移到另一植株。現在，蟬將植原體從藤蔓帶到唐菖蒲。線蟲可以在濕度高的時候從土壤低處出現，夾住唐菖蒲的根。儘管還不知道原因為何，但有些品種比其他品種更為敏感。

## 6. 葉燒

### 辨別方法：

葉子和花朵上會出現褐色斑點，尤其在夏季溫度高而濕度低。主要原因是由於根部發育不全導致缺水。某些品種比其他品種會更敏感。植株吸收的水分應大於蒸發的水分。如果吸水量少於蒸發量，植株就會出現永不消失的棕黑色斑點。

## 7. 土壤酸鹼敏感度

唐菖蒲對鹽分敏感，高濃度會延緩根部生長，而且由於植株吸收水分能力降低，還會對開花造成危害。根部硬化且脆化，更容易受到物理性損害。與健康的植根相



### Measures for prevention & control:

The deformity is caused at the moment the flower is formed, between the second and fifth leaf. If in that period a virus or Phytoplasma infects the plant, this disturbs the creation of the flower. At the time of flowering individual plants will produce deformed flowers. The virus and Phytoplasma can be transported by insects and nematodes, carrying particles from one plant to another. Nowadays, cicadas bring Phytoplasma from wine vines to gladioli plants. Nematodes can come up from the lower soil levels at times of high humidity, pinching the gladioli roots. Some varieties are more sensitive than others, although the reason why is unknown.

## 6. SUNBURN

### Identification:

Brownish spots on the leaves and flower occur, especially during summer when temperatures are high and humidity levels are low. The main cause is water shortage due to an insufficiently developed root system. Some varieties are more sensitive than others. The plant should absorb more water than it vaporizes. If the water uptake is less than the amount vaporized, the plant creates brown-black spots which will not disappear.

## 7. SALT SENSITIVITY

Gladioli are sensitive to salt and high concentrations delay root growth and can also endanger flowering due to a plant's reduced ability to absorb water. The root system hardens and becomes brittle and more susceptible to physical damage.

比，會變成黃褐色。至少在種植前六週做土壤取樣是確定pH值、鹽濃度、氯含量和養分的好方法，由此可以調整種植條件。EC 等級不得超過 1.0。同時，對於鹽含量高的土壤，建議要更頻繁地灌溉，避免使用化肥。

## 露天田地裡的盲芽現象

在關鍵時期（第三到第五片葉子出現時）日照不足會導致花梗完全脫水（盲芽）。在第五至第七個葉子出現期間，日照不足會導致花梗上減少一些花苞。

特別是在溫暖氣候下，唐菖蒲的種植通常在9月/10月，在冬季（12月、1月和2月）開花。該方法是在露天田地上種植，之後再用塑膠網覆蓋植物。但是，如果十月的溫度仍然較高的情況下這樣做，植物的生長速度將非常快。用塑膠網覆蓋植株雖然可減少 30 - 40% 的光照，然而卻大量的降低開花率。上圖可見花卉減少了100%。

在溫暖氣候下的露天田地中，在高溫下種植，由於多雲的天氣，加上生長速度快且光照強度突然降低，可以達成相同結果。光照減少超過20%會導致盲花。

優質花卉的比例取決於以下因素結合：

- 球莖大小；適合生長季節的正確尺寸。
- 種植密度；考慮到氣候，種植密度過高會導致花卉品質下降。
- 種植深度；種植過深會降低優質花卉的比例。可以之後添加土壤來保持植株向上生長。



## 8. BLINDNESS IN OPEN FIELDS

Insufficient light during the critical period (when the third to fifth leaves appears) can lead to complete dehydration the flower stem ('blindness'). Insufficient light during the appearance of the fifth to seventh leaf will result in the loss of a few buds on the spike.

In warmer climates in particular, gladioli are often planted in September/October to flower during the winter months December, January and February. The system is to plant in an open field and cover the plants with plastic later on. However, if this is done when the temperatures in October are still relatively high, plants will have an extremely high growing speed. Covering the plants with plastic reduces light by 30 - 40%, causing a huge reduction in flowering. Above picture shows a 100% flower reduction.

The same results can be achieved in an open field in warmer climates, planting during high temperatures, with a high growing speed and a sudden reduction of light intensity as a result of cloudy weather. A reduction of light of more than 20% can cause a general abortion of flowers.

The percentage of high-quality flowers depends on a combination of:

- Corm size; the right size of corm suitable for the growing season.
- Planting density; when, with regard to the climate, planting is too dense, leading to a lower flower quality.
- Planting depth; planting too deep will cause a lower percentage of high-quality flowers. Later on, soil can be added to keep the plants growing upward.



## 採收

- 只要花梗上的第一朵花苞出現顏色，即可開始採收。
- 不可等到花開，以免運輸過程發生損傷。
- 採收也可用手從土壤中連帶球莖完全拉出每株枝幹。
- 或於球莖上方 5 公分處切斷莖幹。
- 整齊地將 10 株相同高度的莖幹捆紮為一束，然後在用繩子將每束捆綁起來。
- 剩下的球莖是廢物，應以透明方式處理(\*)。

(\*) 球莖為一次性

開花產品；請勿再重複種植使用過的球莖，因為這會侵犯智慧財產權，而且會導致花卉數量和品質下降，最後破壞市場。



## HARVESTING

- Flower stems are ready to harvest as soon as the lowest flower bud displays color.
- Do not wait until flowers open up, to avoid damage from transportation.
- Harvest by pulling each stem completely, i.e. with corm, out of the soil by hand.
- Cut the stem 5 cm above the corm.
- Make neat bunches of 10 stems of the same height and bind each bunch with string.
- Leftover corms are waste and should be disposed of in a transparent manner (\*).

(\*) Corms are meant for one-time flower production; Do not re-plant and grow from previously used corms, as this infringes with intellectual property rights and will result in a decrease of both quantity and quality of flowers and ultimately kill the market.



## 採收、加工、包裝、保存和運輸

- 在採收、加工、包裝、保存和運輸期間，收割後的植株務必一直保持直立。
- 如果放置在水平或傾斜的地方，則花梗末端會開始向上彎曲。
- 一段時間後，枝幹的彎曲變得更加僵硬。之後，當枝幹再次直立時，花序末端會保持彎曲。
- 利用及時調整支撐網（或繩索）的高度來確保枝幹保持直立，甚至在採收前也要避免這種情況。
- 在保存和運輸過程，建議使用深桶/容器來支撐花梗。

總而言之，當唐菖蒲球莖和花卉受到細心照料、確實耕作與採收方法時，唐菖蒲栽培獲利很高，同時這些美麗繽紛的花是現有花卉栽培中最亮麗且豐富的回報性資產。

如有任何疑問，請隨時與我們的代表和經銷商聯絡，或直接透過電子信箱與我們聯絡：[info@stoopflowerbulb.nl](mailto:info@stoopflowerbulb.nl)

目標 Stoop flowerbulbs 相當重視優良的建議和指導。這些栽培指南所包含的資訊已提供給我們尊敬的合作夥伴和客戶，以支持優質切花的生產。

永續性 Stoop 支持永續耕作實踐。提到特定化學物質的部分，僅用於說明參考；相關人員應該總是先評估自然性/生物性替代品的可用性和有效性。良好的農場和蟲害管理方法將減少生產所需化學物數量。

以上所描述的建議、資源、栽培方法等使用 僅供參考。對建議和說明應該根據當地具體情況而定。這些指導方針是我們專業知識目前最佳的經驗分享。但是，對於使用建議的任何結果或採收或出售的花卉結果（無論是數量還是品質），都不在我們責任內。

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## PROCESSING, PACKAGING, STORAGE & TRANSPORT

- During harvesting, processing, packaging, storage and transport it is important to always keep harvested stems upright.
- If left in a horizontal or sloping position, the tip of the flower stem will start to bend upward. After a while, this bend in the stem becomes more rigid.
- Later, when the stem is placed in an upright position again, the tips of the flower spikes will remain crooked.
- Avoid this by ensuring that the stems are standing up straight, even before harvesting, by adjusting the level of the support netting, (or ropes), in time. The use of deep pails/containers to hold flower stems during storage and transportation is recommended

In all, when gladiolus corms and flowers are treated with care and solid cultivation and post-harvest practices are applied, Gladiolus cultivation is highly profitable and these beautiful flowers are a rewarding asset to enrich the existing floricultural spectrum.

For any questions you may have, feel free to contact our representatives and distributors, or get in touch with us directly at [info@stoopflowerbulb.nl](mailto:info@stoopflowerbulb.nl)

**Purpose.** Stoop flowerbulbs attaches much importance to good advice and guidance. The information contained in these cultivation guidelines has been made available to our respected partners and clients as a service to support the production of high-quality cut flowers.

**Sustainability.** Stoop stands for sustainable farming practices. Where specific chemicals are mentioned, these are for illustration purposes only; one should always assess the availability and effectiveness of natural/biological alternatives first. Good farm and pest management practices will reduce the need for and amounts of chemicals for production.

**Chemicals/Fertilizers.** The specific chemicals/fertilizers are mentioned, these are included, which are not sold/ allowed to use for gladiolus cultivation in Japan.

Please check carefully by yourself if they are permitted for usage as registered chemicals by Japanese Agricultural Chemicals Control Act. The usages for nonregistered chemicals and except for registered condition are prohibited by the aforesaid act.

**No liability.** All advice is given without obligation, the application of advice, resources, cultivation methods, etc. as described is entirely at your own risk. Interpretation of the advice should always be in the context of specific local circumstances.

These guidelines were made with the best intention with the knowledge of today. However, Stoop cannot be held responsible for any results of the application of the advice nor the outcome of harvested and sold flowers, be it in quantity or in quality.

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