Growing morels *for market.*



PRO PODs · Field techniques, measurements and growing decisions.



IN THIS GUIDE

02 Plan the season with field measurements

03 Prepare the soil and plan amendments

04 Build a shelter you can manage

05 The POD starts the mycelial network

06 Measure water before scheduling irrigation

07 Keep spawn cold and plant at the right depth

08 Connect nutrient bags when the mycelium is ready

09 Building reserves and overwintering

10 Set up for spring fruiting

11 Watering as young morels grow

12 Assess crop damage before treating

13 Harvest cleanly and prepare for the next crop

14 Growing techniques on video

15 From spring to harvest

SPECIES · CYCLE · WHERE TO MEASURE

Plan the season with *field measurements*

Use the calendar to plan. Let the crop tell you when to act.

From fall planting to spring harvest

01 Before the spawn arrives, prepare the shelter, beds, water supply and cold storage.

02 Sow Importuna, Eximia or Sextelata in fall, usually October-December, once the air temperature reaches the threshold below.

03 As the mycelium spreads, track its advancing edges, keep the surface moist and connect the nutrient bags when the patches are ready.

04 Watch for stored reserves as the crop enters the cold period. Stages overlap, so use field observations as well as elapsed time.

05 In spring, check reserves, moisture and temperature together. February-May is a regional window. Pick when the morels are mature.

Two temperatures guide two decisions

FALL SOWING	AIR temperature under cover, 10 cm above soil at the warmest time of day, falling to 18 °C.

Two temperatures guide two decisions *(continued)*

SPRING FRUITING	Measure SOIL temperature 10 cm deep in the morning. Look for 6-7 °C for Importuna or Eximia and 8-9 °C for Sextelata.

Rufobrunnea follows a different cycle

• Ceramyca sows Rufobrunnea on the first day of summer, tracks heat and moisture through summer and watches the crop as fall temperatures drop. The **18 °C** fall sowing threshold does not automatically apply.

Terms to know

MYCELIUM	The filaments that spread through the soil.
SCLEROTIA	Structures where the fungus stores reserves.
MORELS	The visible fruiting bodies. Harvest them when mature.

THE GROWING CYCLE

1 Prepare — 2 Sow — 3 Incubate — 4 Reserves — 5 Harvest

FALL TO SPRING

Importuna · Eximia · Sextelata

SUMMER TO FALL

Rufobrunnea: sow in early summer



A TIP FROM PODDY

I test the irrigation and clear space in cold storage before my spawn arrives so I can sow on time.

Read online › V01

SITE · SOIL TEST · COMPOST

Prepare the soil and *plan amendments*

Start with a soil test and good structure. Amend only where needed.

Assess the site

• Check shade during growing hours and throughout the season. Plan water supply, drainage and paths to keep feet off the beds. Adjust shade under cover.

• Record texture, organic matter, calcium, the pH test method and past treatments. Check roots, runoff and water quality. Avoid fresh, decomposing material.

Amend only if the soil test calls for it

• Ceramyca uses a pH of about 8 measured in KCl as a reference. Water pH is a different measurement. Neither a universal optimum nor an amendment rate can be inferred from that figure.

• If needed, the method calls for chalk (CaCO3) with less than **1%** magnesium. Determine the rate, then recheck calcium and pH. Avoid quicklime and hydrated lime.

Prepare a stale seedbed and finish the beds

Prepare a stale seedbed and finish the beds *(continued)*

01 Work the surface lightly and let weeds germinate. Remove them shallowly to avoid bringing up more seeds. Repeat if weeds persist.

02 Work the soil once it is dry enough to crumble without sticking. Leave some aggregates and avoid pulverizing it.

03 Shape accessible raised beds with an even, continuous top.

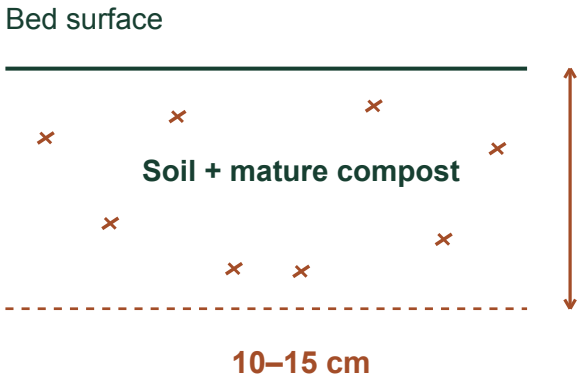
Ceramyca's compost amendment

SELECT — Use mature hardwood compost of known origin and composition. Benchmarks are ≥2 years old, C/N around 9 and compost pH around 8, with no active decomposition.

MEASURE — If indicated, use **10 L/m²** of bed as a starting point, excluding paths. For **50 m²**, that is **500 L**. Adjust to the soil.

INCORPORATE — Mix into the top **10-15 cm** before finishing the beds. Ground cover and nutrient bags serve other purposes.

MIX INTO THE TOPSOIL



10 L/m² of bed

if amendment is needed

50 m² = 500 L



A TIP FROM PODDY

I read the soil report before reaching for the chalk.

Read online ›

FLEXIBLE GREENHOUSE · TUNNEL-FLEX

Build a shelter you *can manage*

Lay out the paths before setting the hoops. Check the structure after severe weather.

Choose a size

Flexible greenhouse	3 × 40 m, about 2.20 m high. Three beds about 80 cm wide. Around 400 PODs per 100 m² of growing area.
TUNNEL-FLEX	4 × 40 m, about 1.30 m high. Two beds about 130-180 cm wide. Around 600 PODs per 125 m² of growing area.

Assembly sequence

01 Mark the centerline, beds and paths. Measure the actual growing area separately from the shelter footprint.

02 Set anchors on the centerline, **3 m** from the first and last hoops.

03 In dry weather, build each hoop from four **1.75 m** rods and three aluminum connectors, totaling **7 m** nominally. Apply Sikaflex 11 FC as directed.

04 Space hoops **75 cm** apart. Mark the legs for **50 cm** insertion and double the hoops at each end.

Assembly sequence *(continued)*

05 Tie the ridge line to each hoop with a clove hitch, alternating sides of the connector. Use one fixed end and one removable end.

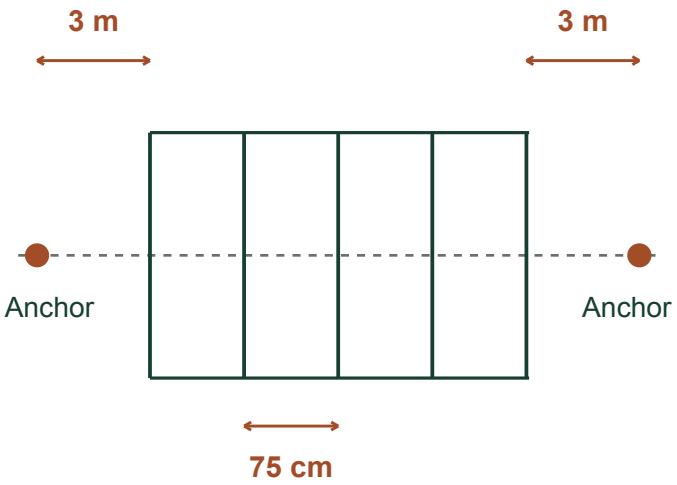
06 Unroll the **9 × 50 m** green open-mesh net and weigh down the sides. Fasten the ends and ridge line to the anchors with **9 mm** Colson cable ties. Check tension throughout.

Prepare for wind and snow

• About **70 km/h** is the stated gust benchmark for a correctly assembled shelter. Site resistance varies. Lower it before stronger gusts arrive and plan ahead for snow.

• Two linked Colson ties form a breakaway connection. Secure anchors are still essential. Recheck knots, fasteners and weights after assembly.

TOP VIEW



Insert legs 50 cm deep

Not to scale



A TIP FROM PODDY

I assemble the shelter in dry weather so the joints and adhesive can set properly.

Read online › V03 V04

PRO POD · LIVING SOIL · BACTERIAL INPUTS

The POD starts the *mycelial network*

The POD gives the mycelium a starting point in the living soil.

How the PRO system works

• The initial food supply stays inside the ceramic POD. Mycelium grows into the soil through the lid opening. Connect commercial nutrient bags after colonization.

• Terracotta allows water and gases to pass through. Retrieve the PODs after harvest and begin each season with fresh spawn.

• After burying the PODs and leveling the surface, keep monitoring moisture and growing conditions. The system still needs active crop management.

Apply preparations separately

01 Finish cultivating and amending the soil before adding bacterial preparations.

02 Apply just before sowing, ideally at the end of the initial watering that saturates the bed.

03 Mix one product at a time. Dilute powders and stir thoroughly. Keep the preparations separate.

04 Cover the full width and length of every bed. Repeat according to the annual protocol, then restore shade against direct sun.

Application rates and water volume

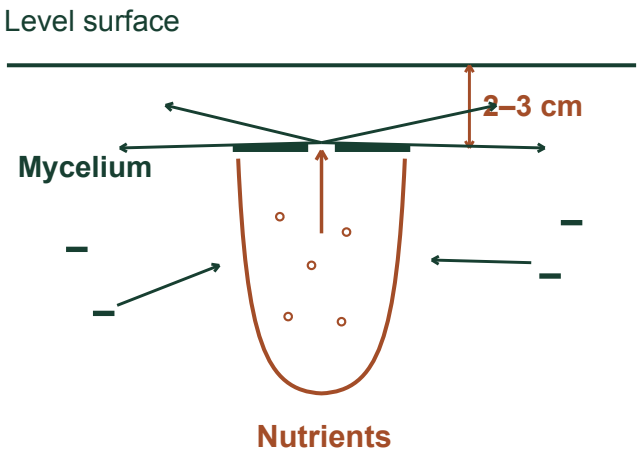
RATE — Follow the instructions for each product and the area being treated.

WATER VOLUME — Adjust to your equipment for even coverage. Dilution rates vary.

What Ceramyca has observed

• The interactions with Pseudomonas putida and the green ground cover were observed in Ceramyca plots. They do not establish protection against all contaminants or guarantee yield. The online guide explains the mechanisms and cites the research.

WHERE THE POD MEETS SOIL





A TIP FROM PODDY

I mix one preparation at a time.

Read online ›

V01

IRRIGATION · FLOW RATE · WHERE TO MEASURE

Measure water before *scheduling irrigation*

Air humidity alone cannot tell you how much water the soil holds.

Three sensors, three measurements

AIR	Keep the thermometer and hygrometer near the crop, out of direct sun. Take readings at the same locations and times.
SOIL	For spring fruiting, measure soil temperature 10 cm deep in the morning.
SOIL WATER	Set a tensiometer 15 cm deep. Wet the ceramic tip for 2 min. Make a 15 cm deep, 2.2 cm wide pilot hole. Use a soil slurry for contact and insert without air gaps.

Set up the RainSystem lines

• The tall Flexible greenhouse has three beds. Lay one tape along each of its two paths. During sensitive growth stages, aim the spray into the paths.

• Reference flow is **1.55 m³**/h per **10 m** of tape at **0.2-0.8 bar**. Add the lengths of all tapes running at the same time.

Set up the RainSystem lines *(continued)*

• Two **40 m** lines total **80 m**. At the reference flow, they deliver about **12.4 m³**/h or **207 L/min**. Check actual supply, pressure and pressure losses.

Calculate water volume

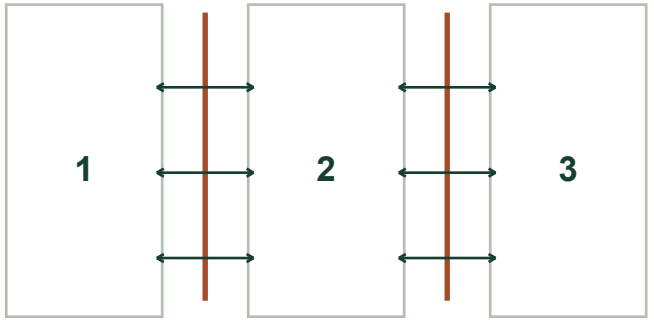
FLOW (m³/h)	Total tape length (m) × 0.155.
VOLUME (L)	Total length (m) × 155 ÷ 60 × time (min).
EXAMPLE	Running 80 m for 1 min gives about 207 L. This illustrates the calculation only.

Check the bed after watering

• Soak the soil before sowing. As the mycelium spreads, water from the paths to avoid washing away the colonized surface.

• Ceramyca gives about **10 m³** per **100 m²** of growing area as a rough seasonal water budget. Record actual use and adjust each watering to the bed.

3 BEDS · 2 PATHS



2 irrigation tapes in the paths

Water wicks into the beds

1.55 m³/h per 10 m

0.2–0.8 bar · reference flow



A TIP FROM PODDY

After each watering, I check moisture in the bed before scheduling the next one.

Read online › V02 V05

SPAWN · BATCHES · STAGGERED ROWS

Keep spawn cold and plant at the *right depth*

Have the beds, covers and water supply ready before opening the bags.

Check and store the delivery

01 On arrival, check the packaging, species and batch numbers. Photograph any issues and report them promptly.

02 If planting must wait, open the boxes but keep the spawn bags sealed. Space the bags apart so cold air can circulate. Store at **2-4 °C**, aiming for **2 °C**, and check the actual temperature.

03 Keep the sealed nutrient bags cool too, in an enclosed space out of animals' reach.

Check that it is time to plant

• For Importuna, Eximia and Sextelata, wait until the air under cover falls to **18 °C** at the warmest time of day, measured **10 cm** above the soil. Rufobrunnea follows a summer cycle.

• Water the beds to saturation before sowing. The ceramic will absorb moisture from the soil.

Five steps to plant your PODs

01 Break up the spawn thoroughly while the bag is still sealed.

02 Fill the PODs generously without packing down the spawn. Replace each lid.

Five steps to plant your PODs *(continued)*

03 Work from the paths and plant the PODs in staggered rows.

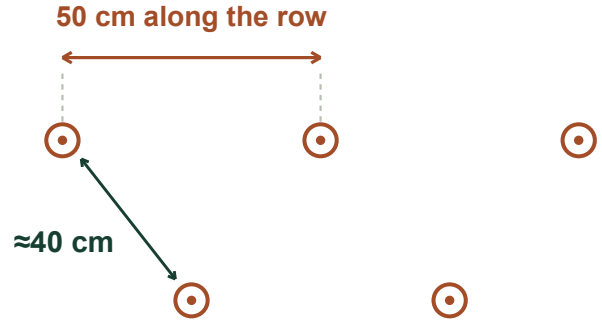
04 Bury the whole POD, with **2-3 cm** of soil above the lid. Level the bed instead of mounding soil over each POD.

05 Replace the low covers for incubation and arrange regular checks.

Spacing at a glance

ALONG A ROW	50 cm between PODs.
DIAGONALLY	About 40 cm to the nearest POD in the offset row.
BEDS	Typical beds are 80-100 cm wide, with PODs 15-35 cm from the edge. Follow the specific layout for larger designs.
PATHS	A typical width is 20-30 cm. Leave room to work without stepping on the crop.

STAGGERED ROWS · TOP VIEW



Offset the second row



2–3 cm of soil above the lid



A TIP FROM PODDY

In the first few days, a shallow POD can attract rodents. I keep **2-3 cm** of soil above each lid.

Read online › V06

INCUBATION · COMMERCIAL NUTRIENT BAGS

Connect nutrient bags when the mycelium *is ready*

Both openings must touch colonized patches. Check the mycelium before deciding when to place each bag.

Track the spreading patches

• Photograph the same spots and compare the advancing white edges. Under favorable conditions they may appear in less than a week, but timing varies.

• Cold can slow growth or hide it below the surface. Check soil moisture and temperature before deciding the spawn has failed to establish.

• PRO nutrient bags are generally placed after 7-15 days, when the patch around each POD is about **10 cm** across. Check each site for contact.

One 3 L bag serves two PODs

01 Keep commercial bags of sterilized grain sealed, cool and protected until needed. Use the supplied bags rather than preparing grain on site.

02 Lay the bag diagonally across the staggered rows, about **40 cm**, so that both ends reach patches of mycelium.

03 Just before placement, make two openings on the same side, one at each end. Each should be about the size of a €2 coin.

One 3 L bag serves two PODs *(continued)*

04 Lay the bag down with the openings facing the soil. Both must touch the mycelium directly, with no gap.

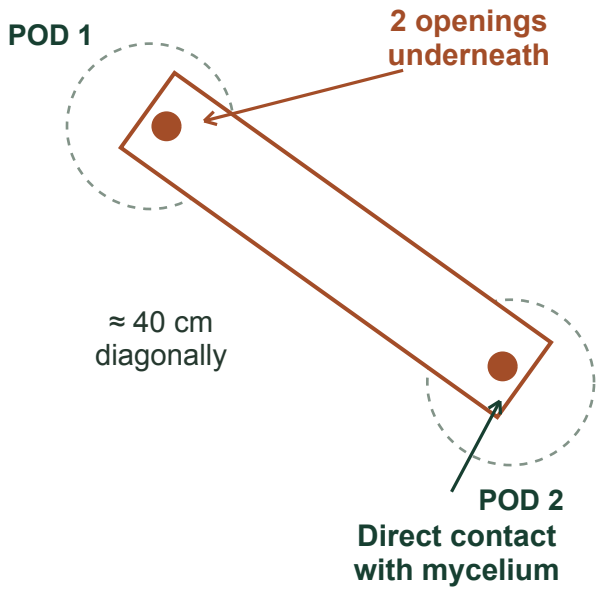
Monitor the connection

• Keep the bed surface moist. Avoid crusting and hard water jets. Water from the paths should reach the bed by capillary action.

• Compare the bags and the spreading mycelium over the following days. A bag can sit in position without connecting. Check both openings before adding nutrients.

• Consider extra nutrients while the mycelium is actively expanding. Reassess when it starts forming reserves.

One 3 L bag for two PODs





A TIP FROM PODDY

I check that both openings touch the mycelium. A poorly positioned bag cannot feed the crop.

Read online › V07 V08 V09

GROWTH · SCLEROTIA · COLD

Building reserves *and overwintering*

White mycelium, orange patches and winter dormancy mark different stages.

Recognize the three phases

EXPANSION	The mycelial network uses available nutrients and spreads through the soil.
RESERVE FORMATION	Sclerotia form and may take on orange tones as they develop. Ceramyca's guide to maturity is 1.5-4 months, depending on conditions.
Vernalization	In the fall-to-spring cycle, the cold period helps prepare the crop for fruiting. Vernalization is a process, not a fungal structure.

Look near the surface first

• With Ceramyca's POD method, a shallow network spreads from neighboring PODs. Areas where the growth fronts meet are centers of reserve formation.

Look near the surface first *(continued)*

• The reserves first appear just below the top centimeter of soil, before the mycelium colonizes deeper layers. Inspect the bed without routinely turning it over.

• Color alone cannot establish a diagnosis. Compare changes in color with colonization, reserve formation and the overall condition of the crop.

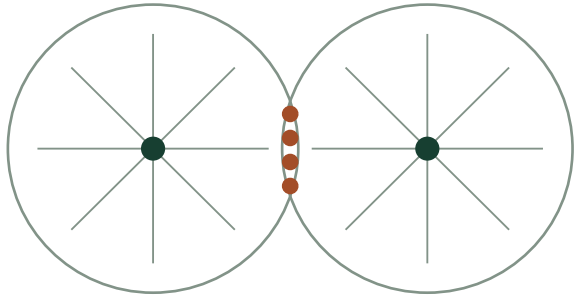
Adjust your next steps

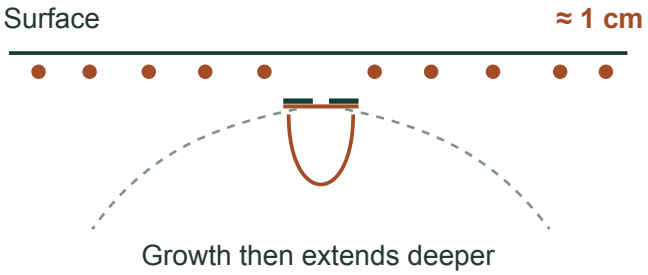
• During active growth, individual patches may benefit from more nutrients. Reassess feeding once reserves start to form.

• Keep the surface moist, watering from the paths when needed. Recheck the same spots before making further changes.

• After wind, rain or snow, check the anchors and covers. Keep recording conditions to prepare the spring setup and track the thresholds for each species.

Mycelial networks meet







A TIP FROM PODDY

After a spell of wind, rain or snow, I check the fastenings and moisture under the shelter.

Read online ›

V10

COVERS · RESERVES · TEMPERATURE

Set up for *spring fruiting*

Set up the shelter for spring, then assess soil moisture, reserves and the warming trend together.

Maintain the microclimate

• Raise a lowered shelter once the snow risk has passed. Late January to early February is a regional reference only. Adjust the light, then restore roughly three-quarters shade as days warm up.

• Keep dark netting off the bed surface. For low tunnels on **80-100 cm** beds, use **6 mm** hoops spaced about **1 m** apart.

• Keep the clear fruiting cover in place and roll up the white cover along the sides. Ventilation holes are **4 cm** across, staggered every **50 cm**.

• Put the white cover back for rainfall over **10 mm**, wind or frost, then roll it up again afterwards. On Tunnel-Flex, the netting, winter cover and plastic all share the same hoops.

Check that fruiting conditions are right

MORNING SOIL TEMPERATURE, 10 cm DEEP	6-7 °C for Importuna and Eximia, 8-9 °C for Sextelata. Compare several days' readings with reserve development and soil moisture.

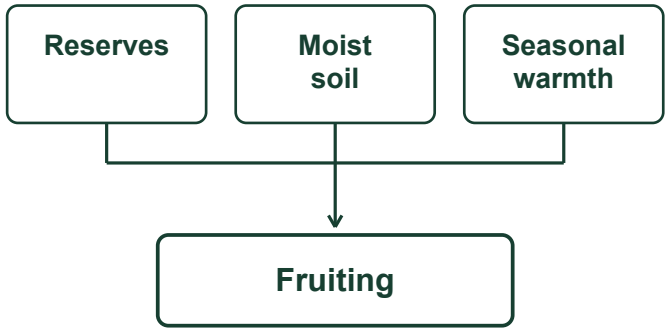
Check that fruiting conditions are right *(continued)*

MORNING WATERING	Water generously early in the morning, then let the soil warm up. Avoid prolonged standing water. Puddles should disappear within a few hours.
FIRST MORELS	At first emergence, aim for about 85% air humidity, measured in shade 10 cm above the soil between noon and 2 p.m. Supply water to the smallest morels by capillary action.

If the soil warms too early

• If soil near **0 °C** warms rapidly and prolonged frost is forecast, use Ceramyca's cooling method BEFORE the soil reaches **5 °C**: saturate it with cold water, then measure the temperature drop.

• This aims to delay fruiting. Saturating soil that is already warm can instead encourage fruiting. Distinguish this cooling step from the watering that starts fruiting. Rufobrunnea follows its own cycle.



Other conditions

Early warm spell, frost forecast

Slow growth BEFORE 5 °C





A TIP FROM PODDY

The same water can serve two different purposes: encourage fruiting or slow down a warm spell.

Read online ›

V11 V12 V13

GROWTH · HUMIDITY · OBSERVATION

Watering as young *morels grow*

Observe each morning, measure at midday and check the effect of the next watering.

Follow the same daily routine

01 Each morning, return to the same spots. Compare size and condition, and photograph any changes.

02 Between noon and 2 p.m., measure air humidity **10 cm** above the soil, in the shade and at the same spot every day.

03 Plan the next morning's watering from those readings, soil conditions, the weather and the crop's stage of growth.

Two stages, two watering methods

PRIMORDIA AND TINY MORELS	Water the paths so moisture reaches the beds by capillary action without striking the young morels. Set up drip irrigation before the soil forms a dry crust.
AT ABOUT 3-4 cm	Gradually resume overhead watering in the early morning. Ceramyca describes cycles of about 10 min. Adapt the duration to the system and the soil's response.

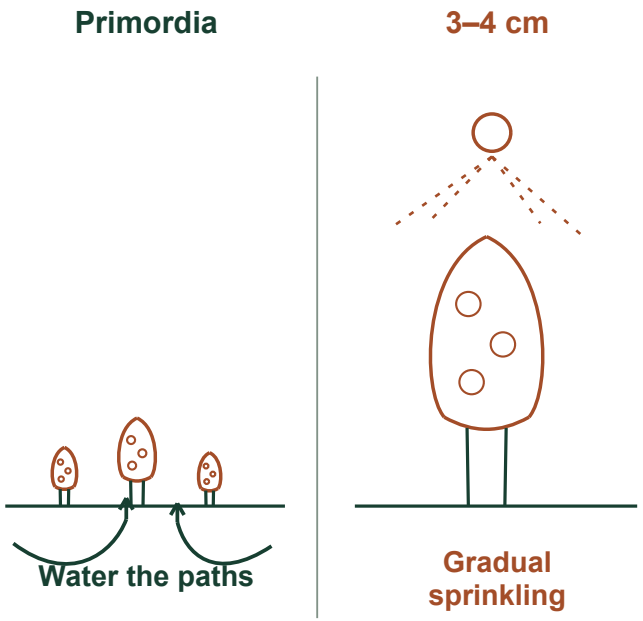
Use readings to guide watering

75-85%	Reference range for AIR humidity during growth.
65% OR LESS IN THE DAYTIME	A sign of drying to investigate before the next morning's watering.
AFTER WATERING	Check both soil and air before watering again. Good air humidity does not guarantee enough moisture in the soil.

Protect the crop without trapping heat

• Leave clear plastic in place. Roll up the white cover, then put it back temporarily for rain over **10 mm**, wind or frost.

• Follow the crop over several days. Some primordia may abort before a new flush. If growth stops or tissues change, compare water, weather and symptoms before taking action.



Early morning



A TIP FROM PODDY

My hygrometer measures the air. It can't tell me how the soil feels underfoot.

Read online › V14 V15

PESTS · SYMPTOMS · AFFECTED PATCHES

Assess crop damage *before treating*

Look for the pest or changes in the tissue before deciding how to respond.

Tell three pests apart

• **Fungus gnats:** look for larvae in the soil and near nutrient bags. Bti (israelensis) does not target adults; kurstaki targets other pests. The French VectoBac WG label lists mosquito larvae, not use on morels. Check the applicable authorization before using any product.

• **Slugs:** check more often when the first primordia appear. If necessary, choose an iron phosphate bait approved for the intended use. Avoid routine preventive applications.

• **Rodents:** Ceramyca describes diverting them with small piles of cooked grain about **5 m** outside the growing area. Monitor grain consumption and activity in the crop through winter to see whether this works.

Four steps in the affected patch

01 Before touching the crop, date the photos and record the species, readings, weather and irrigation.

02 Work from healthy areas toward the affected patch. Clean hands and tools. Avoid shaking affected morels or splashing water on fungal growth.

Four steps in the affected patch *(continued)*

03 Put badly damaged fruiting bodies directly into a bag on site. Seek advice if the affected area spreads.

04 Tell Ceramyca how the symptoms develop and arrange sampling with the laboratory.

Names you might see in a laboratory report

CAP — Pseudodiploöspora longispora

WHITE MOLD — Zelopaecilomyces penicillatus

COBWEB — Cladobotryum protrusum

STEM — Fusarium incarnatum-equiseti species complex

BACTERIA — Effects vary with strain and conditions.

Distinguish pests from other soil organisms

• Springtails alone do not call for treatment. Confirm damage and identify the cause. Use every product only for its approved crop, target, dose and conditions, even if marketed as natural.



Drying



Cracking



Holes



Bite marks



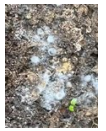
Misshapen stem



Reddening



Mixed damage



Cottony growth



A TIP FROM PODDY

I reach for the hand lens before a treatment. A closer look often tells me more.

Read online ›

V15

MATURITY · QUALITY · REUSE

Harvest cleanly and prepare for the *next crop*

Check maturity, let the crop surface dry and handle containers carefully.

Assess each morel

TYPICAL SIZE	About 10-12 cm whole, including the stem, or 8-10 cm after cutting. Also consider the species and condition of the individual morel.
CAP AND STEM	The pits around the broad middle of the cap open up. The tip may still be closed. Look for a creamy white stem and firm tissue. Set aside reddened or damaged morels for examination.

Pick, sort and transport

01 After irrigation or rain, wait for the crop surface to dry. Use clean containers and work from the paths.

02 Cut above the soil with a clean blade. Leave the soil in place and avoid crushing nearby young morels.

03 Sort before closing the containers. Set aside suspect morels. Minimize handling and transit time, and avoid compression and jostling.

04 Record batch, species, date, quality and harvested weight per bed or unit area. Tell customers to cook morels thoroughly and never eat them raw.

Recover the ceramic PODs in this order

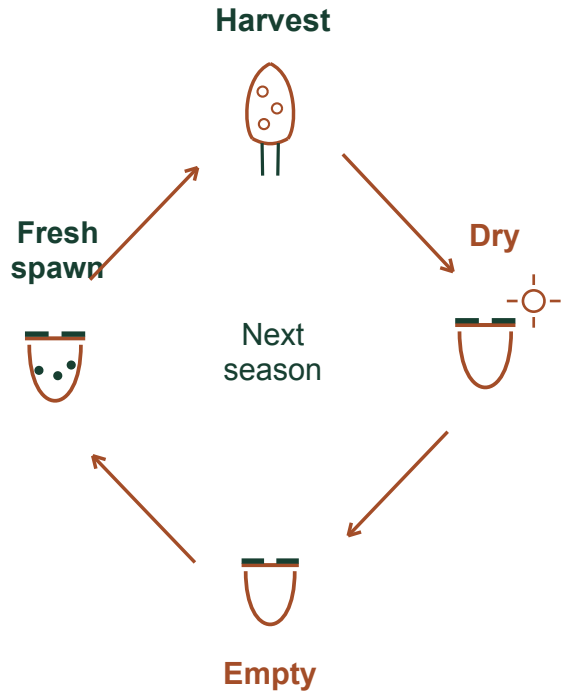
01 Loosen each POD with a small two-tined fork and lift it gently.

02 Sun-dry the PODs with their contents still inside. Then empty them and remove accessible residue.

03 Check for cracks, chips and damaged lids. Pack completely dry PODs with padding in boxes, protected from moisture and knocks.

Prepare for the next planting

- For empty PODs, Ceramyca describes a **30 min** soak in 850 g of hydrated lime per **1,000 L** of water, or several days in the sun. Follow the product's safety instructions. This procedure is for empty PODs, not for amending soil.
- Count the reusable PODs and arrange fresh spawn, cold storage and the annual bacterial amendment.
- Between crops, maintain ground cover and tend the plot. Prepare the soil structure and amendments for the new cycle.





A TIP FROM PODDY

I keep harvested morels clean and loosely packed, then record the batch, date and weight.

Read online ›

V16

VIDEO LIBRARY · INSTALLATION AND NUTRIENTS

Growing techniques *on video*

Click a thumbnail or scan its QR code to watch the demonstration. Original videos are in French.

V01 Mycelium underground



CLICK OR SCAN

V02 Measure with Weenat



CLICK OR SCAN

V03 Assemble the ridge



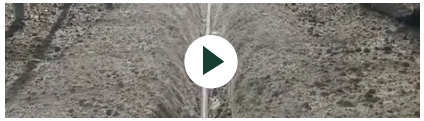
CLICK OR SCAN

V04 Tie the assembly knots



CLICK OR SCAN

V05 RainSystem in action



CLICK OR SCAN

V06 Place PODs and nutrient bags



CLICK OR SCAN

V07 Identify mycelium and reserves



CLICK OR SCAN

V08 When to add nutrient bags



CLICK OR SCAN

V09 Contact after 3 weeks



CLICK OR SCAN



VIDEO LIBRARY · MONITORING AND FIELDWORK

From spring *to harvest*

Find the demonstration you need as the season unfolds. Original videos are in French.

V10 Recognize sclerotia



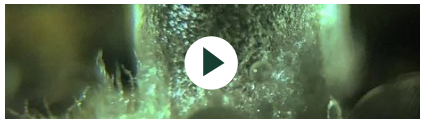
CLICK OR SCAN

V11 Prepare for fruiting



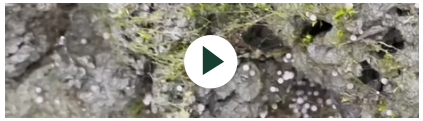
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V12 Support early fruiting



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V13 Recognize emerging pins



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V14 Follow morel growth



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V15 Inspect crop damage



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V16 Harvest at maturity



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V17 Full podcast by chapter



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The full podcast

27 chapter links take you straight to the explanation you need.

