

# Gardening in a changing climate

Yvonne Barton



*How to choose the right plants and best techniques to cope with less water*

**Palazzo della Corgna, Castiglione del Lago, 25 October 2022**

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## Agenda

- Is the climate really changing?
- What is the impact on Lake Trasimeno?
- Why should we not water the garden?
- Why should we not put fertiliser ... or pesticides
- How can we achieve this?
- In bloom now
- Key plants
- Key techniques

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## 2022 – an exceptional year?

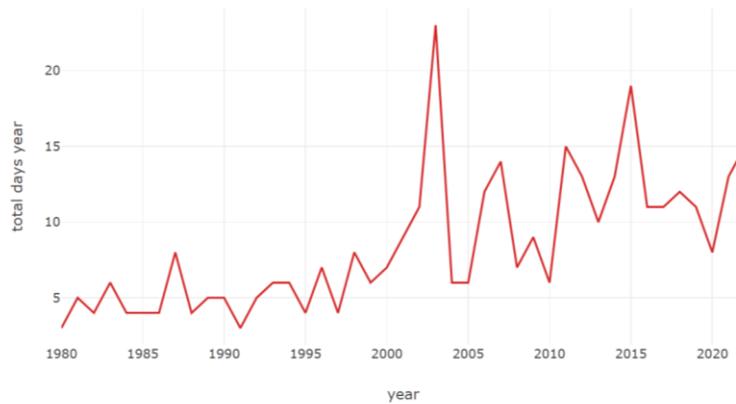


Lake Trasimeno, August 2022 (Priscilla Worsley)

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## Heatwaves\* in Italy



\*Temperatures exceeding 90<sup>th</sup> percentile of 30 year baseline 1981-2010

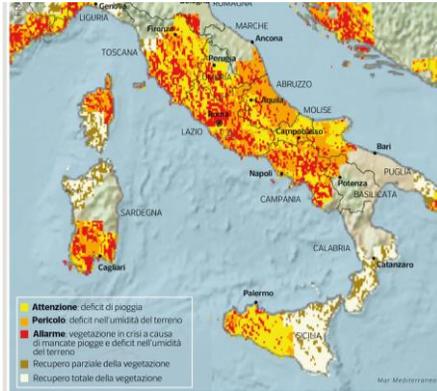
Source: European Drought Observatory

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## The winter-spring drought of 2017

Drought situation as at 20 August 2017



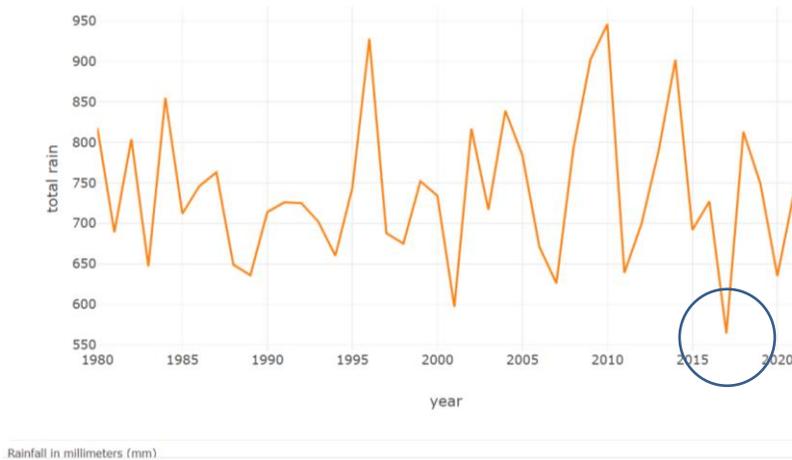
- In the first 6 months of 2017, central Italy received only 20% of the amount of rain that would normally be expected to fall
- Is this going to be the norm?
- Should we water our gardens in winter?

Il Corriere della Sera 30 August 2017 (data from European Drought Observatory)  
[http://www.corriere.it/cronache/17\\_agosto\\_30/effetto-deserto-100-giorni-italia-clima-ab597d36-8cfe-11e7-b5e1-7559ef64c47b.shtml](http://www.corriere.it/cronache/17_agosto_30/effetto-deserto-100-giorni-italia-clima-ab597d36-8cfe-11e7-b5e1-7559ef64c47b.shtml)

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## Rainfall in Italy



Source: European Drought Observatory

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## Winter in Northern Italy



**March 2022**

Rai24

River Po drying up, lowest water levels in at least 30 years.

Sea water – salt – incursion 30km upstream

- impact on agriculture and shipping
- many power stations cannot operate
- loss of 3 GW hydro and 2.5GW CCGT = 10% national demand)

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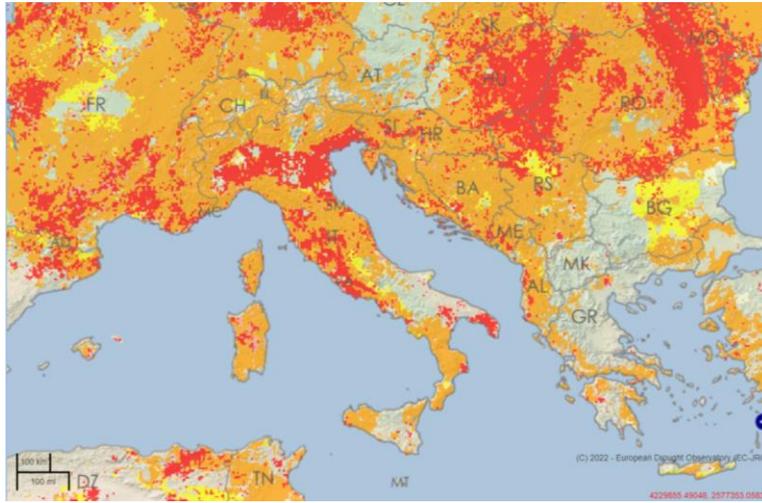
## Winter drought

- Istituto per la bioeconomia del Cnr
- **«La peggiore siccità da 500 anni»**
- No rain in the Po Valley for more than 100 days –  
December 2021 – March 2022
  - Already by February the Po looked as if it were August
- June 2022
- Crisis of Po water levels worst for 70 years
  - No rainfall continuing into June by when salt water was 40 km upstream

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# July 2022



Source: European Drought Observatory

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# Umbria



Trasimenonline.it

Enel gas fired power station at Pietrafitta

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# Lake Trasimeno



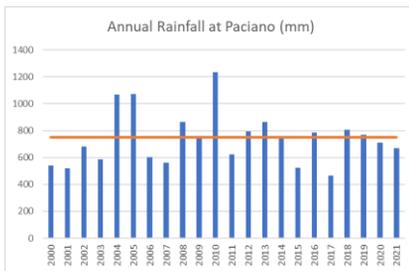
Satellite image 2 July 2022

Umbria24

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# Umbria



- Winter-spring 2022 had less than 20% rainfall as in 2021
- September floods were not enough to re-fill Lake Trasimeno
- October has been warm and dry
- Hopes for November rain?



Stranded boats, Lake Trasimeno September 2022 (Priscilla Worsley)

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## 2022: hottest year since 1800\*

- Trasimeno in 1822 ‘the song of the cicadas’

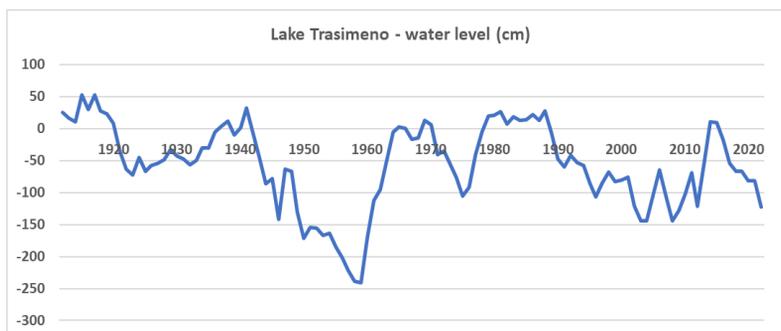


Uninterrupted drought for several months in summer and desperate local farmers held [prayer sessions lasting 72 hours without a break](#). High temperatures continued into October – the cicadas were still ‘singing’, which they only do if the temperature is above 30°C. In November it started to rain and kept on raining every day – snow included – right through to May.

\*CNR report 10 October 2022: Italy registered 0.96 degree C above average 1990-2020<sup>13</sup>

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## Lake Trasimeno



- 1400 to 1850 Lake Trasimeno was about 2m higher than today’s ‘0’ level
- Umbra Acque are constructing a pipeline bring in 15 million m<sup>3</sup> water per annum from a dam in Valfabbrica, northeast of Perugia.

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## What worries me ...

- Lack of **winter** rain
- Strong southerly winds in **summer**
- Mild winters (but with cold snaps)

Without all this we could cope with the usual hot dry summers

“When we used to have normal weather”

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## What does this have to do with gardening?

- Gardeners can help to
  - Reduce water usage
  - Especially not using treated potable water
  - Reduce fertilizer use which causes nitrate run-off and aquifer contamination
  - Stop using pesticides
  - Stop using weed killer
  - Encourage habitat for wildlife
  - Conserve native flora

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## Algae and fish in Trasimeno



Build up of algae during hot weather - happened as early as April in 2022. Leads to a reduction in oxygen, proliferation of bacteria and fish die. **Nitrates** in the water make this process worse. 17

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## Insects and gardens

- Warm winters – bees and other insects are on the wing early



Bee visiting *Lonicera fragrantissima* in February

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## Swarming honey bees



Bee keeper Doreen Sutton removes the swarm, May 2020

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## Why should we not water the garden?

- The old concept of an “English style garden” is totally unsuited to the natural environment and climate in central Italy.
- Water-wise gardening is fundamental: the cost of water can only rise and water resources are becoming ever more scarce.
- We want to preserve the ‘spirit of place’ and create a garden in harmony with the surrounding countryside.



Mediterranean Garden Society  
Associazione Giardino Mediterraneo

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## This approach does NOT apply to ...

- Vegetables
  - We want our veg to grow quickly and to mature within a single season
  - They need all the water and nourishment we can give them
- Plants in pots
  - They cannot seek out water and nutrients for themselves

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## How much water would we save?

An 'English style' lawn:

- Needs on average 6 to 8\* lt of water per day per square metre
- During a watering season of 150 days this means about 1000 lt of water per square metre per year
- A small lawn measuring 5m x 10m requires  
**50.000 litres of water every year**
- And in the end it's still only grass.



*\*Data provided by Vivaio Salto del Prete*

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## How can we achieve this?

- The answer can be found in the surrounding countryside: we should imitate these conditions.
- In the Mediterranean 'Macchia' the plants grow happily without being watered or fertilised.
- **Wet** winters are followed by hot dry summers with sporadic but heavy rain storms.
- The plants are trimmed by goats and other wild animals.



Macchia  
Maremma

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## Choose the right plants

- Indigenous plants that grow in the countryside don't get any care.
- Cistus, phlomis, broom, arbutus, dog rose, stachys, thyme, helichrysum, euphorbia, orchid, anemone, poppy, euonymus, dog wood, juniper, gladiolus, cyclamen ...



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## Indigenous plants

- Under threat from weed killer
- Destruction of flora in roadside verges and olive groves



*Gladiolus byzantiunus*

*Orchys purpurea*

*Centranthus ruber*

*Cistus salvifolius*

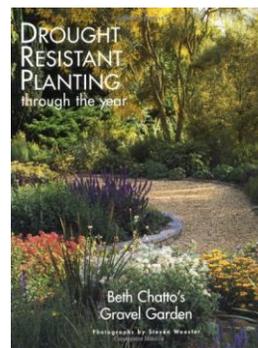
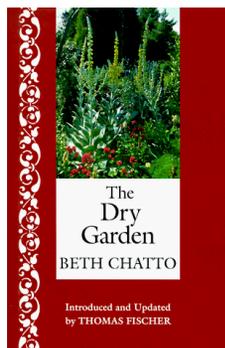
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## The right plant in the right place

Choose the plant according to its needs:

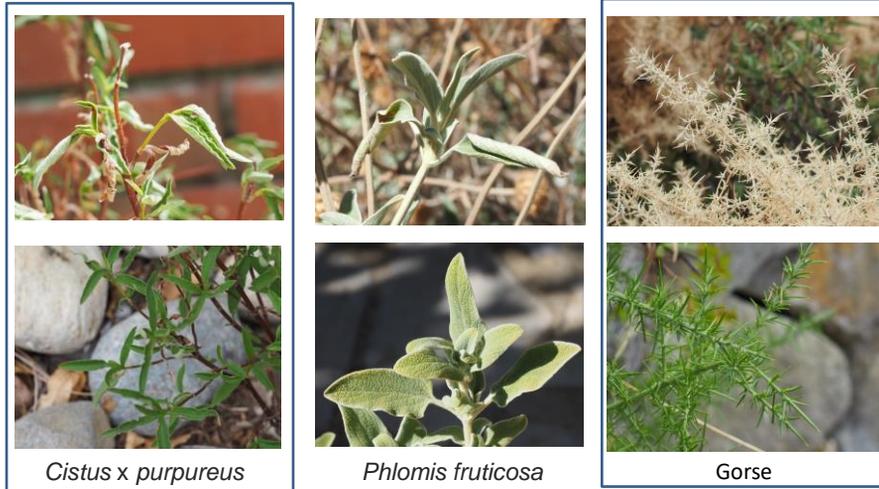
- Drought tolerance
- Winter cold resistance
- Sun or shade
- Alkaline or acidic soil
- Clay or sandy soil



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## Plants with natural defences



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## Spirea survives



August 2017



October 2017



April 2017

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## In bloom now



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## Plant correctly

- The right moment is in autumn
  - Mediterranean plants do not grow in summer
  - In autumn the soil is softened by rain which allows the roots to penetrate better down into the soil
- For more effective watering, make a 'basin' around each plant approx. 60cm wide and 20cm deep
- A square hole for trees stimulates the penetration of the roots into the soil
- Group plants quite close together to create a cooler micro-climate

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## Planting shrubs now



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## What if I can't find the plants in autumn?

- This can be challenging
- Many vivai only stock up in spring
- If necessary, you can also plant in March
- Otherwise keep the plant in a pot until autumn
- Any plant that you put into the ground after the end of April is going to really struggle ....  
... even if you water it all the time



Thriving new cistus with crisped-up shrubs in the background

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## Plants start off best in square pots

- Round pots make roots grow the wrong way
- Square pots stimulate vertical root growth and prepare the plant for searching out water and nutrients



Photos: Olivier Filippi

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## Plant bulbs now



Tulips can wait until December

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## Water wisely

- 5 to 30 litres at a time every fifteen days (or more) in the first year
- Water in the evening?  
.... Or in the morning?
- Water slowly by hand
- Group together plants according to their water needs:
  - place pots near to the house and more resistant plants further away
- Remember that plants indigenous to Mediterranean climates not only need no watering but **suffer** if watered in summer as it can cause disease and promote excessive growth which will reduce their lifespan. Let them aestivate in peace.



*Photo: Olivier Filippi*

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## Can I use 'grey water'?

- In theory yes but I have not been successful

... perhaps our washing-up water is too grey?

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## Make use of hard landscape features

- Use raised beds, terracing, dry stone walls to imitate nature: this creates drainage and captures moisture



*Centranthus ruber* 'Pink Sensation', & 'Albus'; *Cistus x purpurea*; Iris 37

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## Make use of hard landscape features



*Rosa Pompon de Paris*; *Ceanothus repens*

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## Prune a just little

- Choose the right plant for the right space and don't try to constrain its growth habit.
- Avoid excessive pruning – but trimming evergreens into spheres can emphasise their natural forms, thereby accentuating the Mediterranean atmosphere in the garden.



Foto: Trimmed spheres, Garden of Gary, MGS Italy member

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## Avoid a 'mono culture'



- Putting all the same plant invites pests and diseases e.g. box blight
- All year round interest with a variety of blooming and fruits

20 different shrubs suitable for hedges and topiary  
BotanicalDryGarden, Grosseto

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## Trim shrubs now



*Teucrium flavum* in June



*Teucrium flavum* in October

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## A plea to outlaw the mutilation of trees and shrubs



- Plant suitable trees that ideally are native
- Select types that fit the space when fully grown
- *Quercus pubescens* (known as Roverella) instead of Austrian pines?

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## And be less tidy



Little Weed

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## Mulch and Compost

### Compost YES!

- Compost is an intelligent way to recycle garden way and can be used to improve the structure of stony soils

### Fertilizer NO!

- There is absolutely no need to give fertiliser – in fact it stimulates lush growth that cannot be sustained by the plant in a drought. Plants in pots and roses are the exception

### Mulch YES!

- Mulch helps keep down invasive weeds and reduces water evaporation from the soil
- It can be organic or mineral, e.g.
  - Bark
  - Gravel

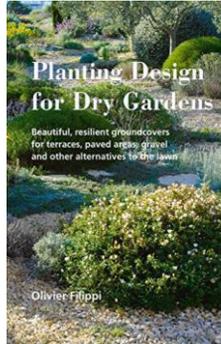
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## Reduce, replace or eliminate the lawn

Various types of alternatives to lawns recommended by **Olivier Filippi**, pioneer of dry gardening, developed through experiments in his own vivaio e garden:

- *Non grass lawn*
- *Gravel Garden*
- *Wild lawn*
- *Tall ground cover*
- *Flowering Steppe*
- *Mixed ground cover*
- *Flowering Terrace*



Also consider using **Bermuda grass 'Yukon'**

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## Reduce, replace or eliminate the lawn



Flowering Terrace



Flowering Steppe



Mixed ground cover



Wild lawn

Photos: Olivier Filippi 46

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## The lawn at Montiano



Saturea, Teucrium aurum, Teucrium ackermani, Achillea umbellatum, Sedum 47

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## Creating a gravel garden



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## Gravel garden



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## Create shade



Rose Lady Hillingdon, Centranthus ruber, Cistus x purpureus, Phlomis fruticosa, artichoke

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## Shade for the soil

- Plants for **ground cover**: create shade which will lower the soil temperature and thereby reduce evaporation



*Vinca major*

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## Water Wise - in summary

1. Select plants carefully by observing the local countryside
2. The right plant in the right place
3. Plant carefully
4. Plants raised in square pots
5. Water intelligently
6. Use hard landscaping to imitate nature
7. Avoid excessive pruning
8. Use mulch and compost
9. Reduce, replace or eliminate the lawn
10. Create shade for the plants and for the soil

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## The challenge



- Colli del Trasimeno; altitude 435 m asl
- Summer: 40 degrees and no rain
- Winter: -8 degrees with rain (but not always) or snow
- Soil: alkaline, clay and stony

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## Key plants



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## Key plants

- We selected certain plants – well known to everyone – that when repeated, form the structure of the garden.
- These plants are well suited to the conditions here.
- Mediterranean plants often have characteristics in common that make them recognisable:
  - Leaves that are
    - Silver or ‘fat’
    - Thin or deeply cut
    - Aromatic
  - Roots that are fleshy or tubers
    - Bulbs, rhizomes

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## Key plants

- Searching further, we find there are lots of interesting varieties even among the more common plants:
  - Cistus
  - Teucrium
  - Santolina
  - Phlomis
  - Rosemary
  - Euphorbia
  - Silver plants
  - Grasses

.... and a word about Roses

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# Cistus



*Cistus incanus* (wild)



*Cistus x florentinus*



*Cistus x purpureus*



*Cistus x tardiflorens*

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# Teucrium



*Teucrium fruticans* 'Azureum'



*Teucrium divaricatum*



*Teucrium aureum*



*Teucrium ackermanii*

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# Santolina



*Santolina chamaecyparissus*



*Santolina benthamiana*



*Santolina viridis* 'Primrose Gem'



*Santolina rosmarinifolia* 'Caerulea'

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# Phlomis



*Phlomis fruticans*



*Phlomis purpurea*



*Phlomis* 'Le Chat'



*Phlomis purpurea* 'Alba'

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# Rosmary



*Rosmarinus officinalis* 'Sappho'



*Rosmarinus officinalis* 'Boule'



*Rosmarinus officinalis* 'Majorcan Pink'



*Rosmarinus officinalis* var. *albiflorus*

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# Euphorbia



*Euphorbia characias* subsp. *wulfenii*



*Euphorbia myrsinites*



*Euphorbia* 'Blackbird'



*Euphorbia rigida*

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## Silver plants



*Artemisia arborescens*



*Ballota pseudodictamnus*



*Helichrysum italicum*



*Atriplex halimus*

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## Grasses



*Miscanthus sinensis*  
'Gracillimus' frosted in winter



*Stipa tenuissima*



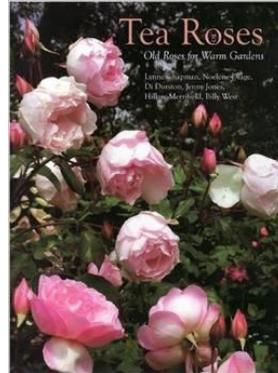
*Poa labillardieri* on a frosty day

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## A word about Roses

- Are roses too needy for a Mediterranean garden?
- No, but we must choose the right type of rose.
- Many antique varieties are better suited to a dry climate, for example:
  - China
  - Tea (not Hybrid Tea)
  - Noisette
- All these do well without watering or pruning
- Just give them some rose feed in winter



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## Some reliable roses



*R. banksiae lutescens* (Botanica)



Papillon (China)



Felicité et Perpetué (Semprevirens)



William Allen Richardson (Noisette)<sup>66</sup>

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## Colour in every season



*Miscanthus sinensis* 'Gracillimus' in winter sunlight

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## Do we need 5 seasons?

- Winter
- Spring
- **Early Summer**
- **High Summer**
- Autumn

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## Colour even in winter



*Ulex*



*Iris unguicularia*



*Jasminum nudiflorum*



*Cotoneaster*

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## Spring bulbs



*Anemone coronaria* de Caen



*Tulipa Clusiana* 'Lady Jane'



*Narcissus* 'Minnow'



*Anemone blanda* Blue



*Tulipa saxatilis*



*Narcissus* 'Cheerfulness'

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## Summer



Achillea 'Walter Funke', 'Summer Wine', 'Terracotta'

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## Autumn



Reflowering China roses

72

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# Autumn bulbs



*Cyclamen hederifolium*



*Colchicum byzantium*



*Tulbaghia fragrans*



*Sternbergia lutea*



*Crocus pulchellus*



*Crocus sativus*

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Garden in Umbria

Home Design Challenges Senses Weather Jobs How To Plant of the Month Local Info About FAQs

Umbria, the Green Heart of Italy

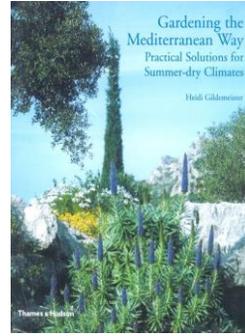
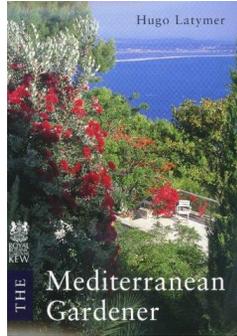
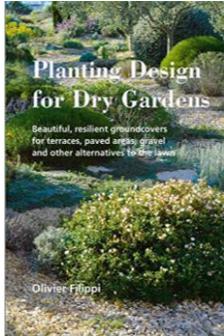
For nearly twenty years I have been learning, by trial and error, how to garden in the unique conditions we find here. I would now like to share what I have discovered about creating a garden that is in harmony with the surrounding landscape and the natural environment, a 'water-wise' garden that needs no irrigation but provides colour and interest all year round. But most of all, a garden that brings pleasure

<https://www.gardeninumbria.com/index.html>

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## Useful books



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