

Fig. 1

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Experiments with *Echinacea*

Rob Cole

We have always grown the coneflower, *Echinacea purpurea*, together with a few of its cultivars, in the garden here at Meadow Farm in Feckenham, Worcestershire; but my interest in them began to grow with the advent of the orange *Echinacea* 'Art's Pride' in 2004, a distinct colour break from the normal pinks and magentas. I started to look at catalogues, old books, the *Plant Finder* and the internet to try to find and record as many of the species and varieties that I could, and was amazed at the close of the year to end up with a database of 75 entries. My database now lists a startling 409 varieties, reflecting the recent surge of interest in hybridising in America, the Netherlands and elsewhere.

Echinacea purpurea, the purple coneflower (fig. 1), is the principal species grown in gardens. It is a native of some central states of the

US, from Michigan south to Georgia and Louisiana. Native Americans used the roots as a herbal remedy, and echinacea tablets are still widely advertised as a preventative or relief agent for colds, though the results of research on its effectiveness vary considerably. In gardening circles it is perceived as a prairie plant, but it also grows in dry, open woods. The daisy flowers are a pinkish magenta, and the petals reflex around a central cone. Other species I have encountered in my ramblings are *angustifolia*, *pallida*, *paradoxa*, *sanguinea*, *simulata*, and *tennesseensis*.

The early attempts to breed a 'better' *Echinacea purpurea*, with more strongly coloured, bigger petals which don't reflex, have now given way to breeding hybrids with orange, yellow, red, white, or green flowers (or any combination of these

colours) and to producing flowers in various colours and degrees of doubling. Hybrids between the various species of *Echinacea* were relatively unknown but in 1997 Chicago Botanic Garden (CBG), under the guidance of Dr Jim Ault, began to experiment with controlled crossings. Coneflowers have proved to be very promiscuous, and many of the hybrids are in



Fig. 2

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turn fertile, which makes the potential for combining characteristics almost limitless. The species CBG used were *E. purpurea* (both magenta and white forms), *E. angustifolia*, *E. paradoxa*, and *E. tennesseensis*.

The first inter-specific hybrid to be released to gardeners in 2004 was

E. 'Art's Pride' (fig. 2), its mother plant white-flowered *E. purpurea* 'Alba' and the father plant yellow-flowered *E. paradoxa*. This hybrid has bright orange flowers. It was named after Arthur (Art) Nolan, the financial benefactor who made the breeding research possible. I became aware of the proposed introduction of this new hybrid in late 2003 when it was featured in the little quarterly magazine *PLANTS*, sadly long since defunct. In June 2004 I eventually bought from Bob Brown two plants which I grew on in pots (and I still have them). The press releases all described it as vigorous, but few purchasers agreed as they quickly lost their plants. The press releases also said that it did not set seed, but I collected viable seed from

my two plants and sowed it in 2005. I selected a few of the resulting 88 seedlings, quite good reds or oranges, and potted them up to see how they fared (fig. 3). The remainder mostly went to the compost heap.

I collected seed from the first selected plants the following year, and so began my attempts at raising better-coloured and more vigorous, longer-living plants. Since the original 2005 sowing, I have to date (in December 2018) potted up 13,572 seedlings and selected 823 as worthy of growing on for further assessment. Of these, 528 have since been lost or discarded as better seedlings appeared, but in spring 2012 the best 100 were lined out in a trial bed in the nursery to explore how they would grow in 'a garden situation' (fig. 4). Most have done remarkably well, especially during the hot spell in July 2013 when not one plant even wilted though the ground cracked in the drought. In fact about 60% have survived the five years since planting. This year I cleared the bed and replanted it with 35 newer seedlings, and I've started to propagate only the very best remaining selections by division. Introducing new plants is a lengthy process!

Echinaceas require a reasonable soil (why do all gardeners think their soil is awful?) and preferably an open position without competition,



though I have found them to be tolerant of a little shade for part of the day. Winter wetness is certainly to be avoided, so a well-drained site is needed, especially for the yellow-flowered hybrids which derive their colour from *E. paradoxa*, a plant found in dry habitats.

A plant classified as a perennial does not, of course, mean that it will last forever, and echinaceas are no exception. But since the introduction of the new commercially available hybrids, they have acquired a reputation as plants to be avoided as they always die. I believe this is often the result of new varieties being introduced without long-term trials, as in the competitive world of 'new plant' production, the breeders' aim is to get a plant into the market before their competitors.

So my aim in seed-sowing and selection has been to produce attractive, vibrant, strong colours on plants which don't readily die. Only by growing lots of seedlings do you stand a chance of finding this ideal combination, and only long-term trials will tell you if it is a survivor. My experience has been that seedlings of hybrids with long slender leaves (fig. 5), typical of *E. paradoxa*, often give the strongest colours but the weakest plants, whereas those with broad leaves typical of *E. purpurea* (fig. 6), are the strongest plants,



but only some produce strong colours: these are the ones I am looking for. At the pricking-out stage I now discard all seedlings with long slender leaves as a matter of course. I pot up and grow on about a thousand seedlings each year and they are lined out

in their pots, outside in the nursery (fig. 7). I have never tried growing them in our polytunnel as I think true hardiness can be assessed only when they're grown with no protection.

My dabbings in raising echinacea seedlings started to have some worthwhile



Fig. 8



Fig. 9



Fig. 10

success in 2009, when some seedlings from 2007 sowings flowered for the first time. Particularly notable was my first double seedling (fig. 8), a dark orange from seed of *E. purpurea* 'Razzmatazz', itself a double, but pink. I named it *E.* 'Feckenham Flame'. Another was a good bright-orange single (fig. 9), and a third was a sunset-pinkish-orange with multi-layered petals (fig. 10). These and many others set seed, and since then, each year, I allow my best selections to seed, then sow the seed in the hope of producing a better next generation.

Echinacea seed is easy to harvest: it can be found in the cone as it matures

and goes brown (fig. 11). It's best collected by cutting off the mature cone, placing it in a container (I use a margarine tub) and leaving it to dry for a day or two. The seed can be dislodged quite easily by shaking and probing (fig. 12), but then it needs to be separated from all the accompanying trash. Each seed looks like the base of an elongated shuttlecock, but this is only the outer casing containing a single true seed shaped like a very small, brown apple pip. It's not necessary to remove the outer casing as it rots readily when sown, allowing the 'pip' to germinate freely when it is ready.

I find it important to go through the collected

seed carefully and save only the firm ones, which hopefully are viable. If you press each of the seeds with your fingernail, you'll see that often the majority can be readily squashed – these are empty husks. If your thumbnail meets with resistance, you will have found a viable seed, one to keep and sow. These are usually a slightly darker colour and look 'fatter', so you can often do a visual trawl before you bring your fingernail into play. All a bit fiddly, but the proportion of viable seed to trash can be quite low (fig. 13), and at least you'll know that you're going to be starting with viable seed.



Fig. 11

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Fig. 12

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Fig. 13

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For seeds I use a 3:2:1 mixture of peat-free compost, John Innes No. 2 and horticultural grit, all passed through a 6mm sieve to ensure a loose, friable mix, a boon when you come to separating and pricking out the seedlings (fig. 14). I sow about 25 seeds in each 9cm pot in mid-December, add a light covering of horticultural grit, and leave them outside in an open frame, protected with a covering of fine mesh to foil hungry mice; set some traps, too, because mice seem to be able to get in anywhere, as in some years I have found to my cost. I give the seeds a gentle watering after sowing, but there's rarely need to water again before they germinate. Don't worry about severe frosts or snowfall as both help the germination process.

Germination usually takes place readily during the early part of the following spring (fig. 15), and the seedlings should be ready for potting up individually into 11cm pots by the end of April.



Fig. 14

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Fig. 15

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Fig. 16

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Fig. 17

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Fig. 18

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Fig. 19

Grow them on unprotected, and you can expect about half of them to flower around the end of July in the same year and the remainder the following year.

At the selection stage, I look for bushy plants, upright and sturdy, not too tall (tall plants usually fall over so are the first to be discarded), and clean-coloured flowers (especially reds and oranges) (figs 16 & 17), preferably on a strong, dark stem (fig. 18), floriferousness, and giving a

long period of flowering with a constant succession of buds. In later years, some of my single-flowered seedlings have had a double or triple layer of petals (fig. 19), and I am trying to preserve and encourage this feature. Double flowers occasionally appear (figs 20, 21 & 22) and I select any good forms and save what little seed they produce to try to increase the possibility of these occurring, though seeds from double flowers don't always produce double seedlings.

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Fig. 20

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Fig. 21

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Fig. 22

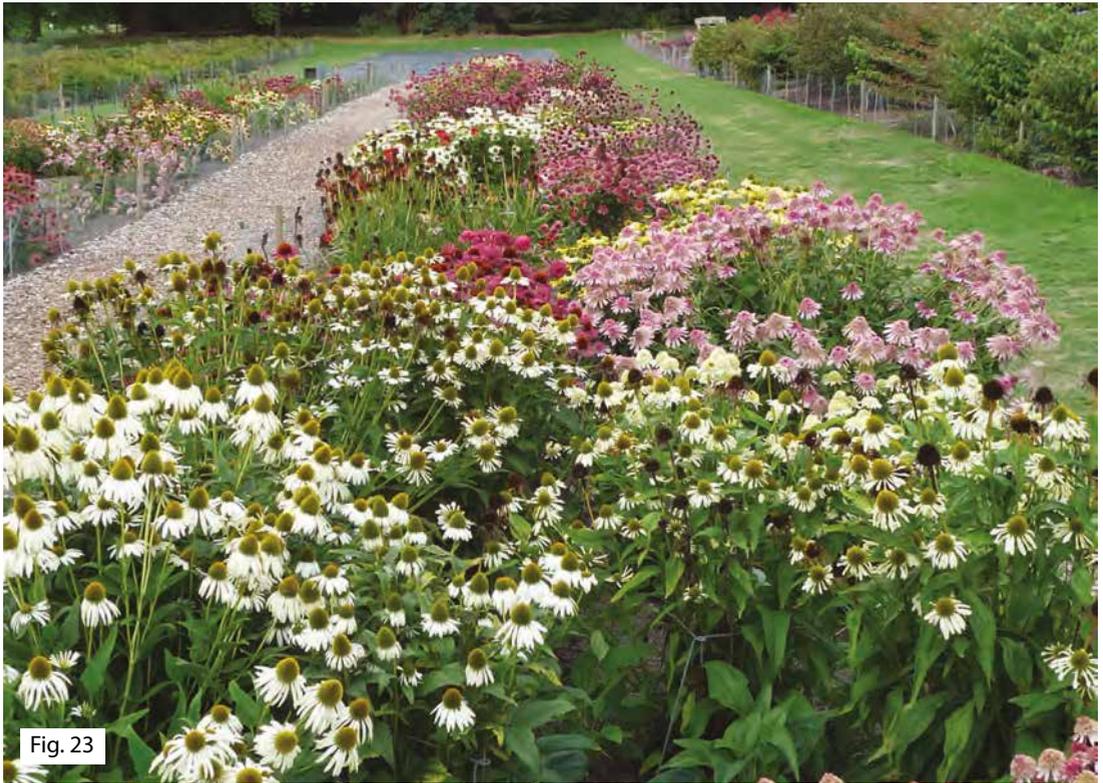


Fig. 23

Try to be totally ruthless in your selection process! I always seek the help of my wife to curtail my enthusiasm for keeping too many, and this has kept the selections to manageable proportions and only the best performers. I give each selection a reference number comprising the year of selection and a sequential number, for example 2017/035, and now I always take a photograph of the flower as a reminder which helps when I come to decide which seed to collect.

I keep a computer database of all of the selected seedlings to record their reference number, the seed parent, the date of sowing, a description, and a note of when it died or was discarded.

The RHS is currently conducting a five-year trial of commercially available echinaceas (fig. 23), and I am very much enjoying my role on the team of assessors. The results of the trial to date indicate that some of the plants are probably in line for an AGM, some have

performed rather poorly and some of them have died completely – all absolutely normal in a typical garden situation!

My experiments have always been carried out on an amateur, hobby basis, and the bees have always done the pollinating – I merely choose what I consider the best results of their work. But raising and assessing these plants has given me so much pleasure over the years, and provided an array of interesting variations. 🐝

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