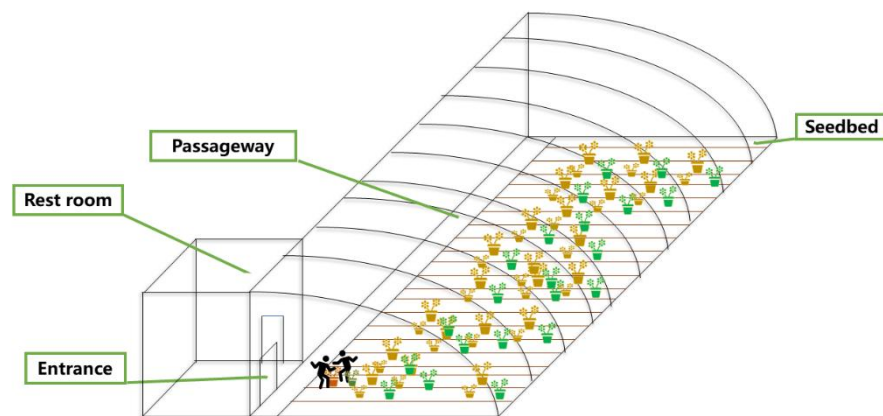


Plant material cultivation and traits measurement

To improve the reproducibility of the method, this section will add specific operational details to the planting and data measurement of the main text.

The plant material used in this study was grown and maintained in a single-slope solar greenhouse in Changping District, Beijing (supplemental figure 1). This greenhouse can withstand strong light in hot summer and provide insulation in cold winter. We did not impose any shading or lighting supplementation measures to regulate the flowering period.



supplemental figure 1 single-slope solar greenhouse

At the cuttings stage (supplemental figure 1), we used 81-holes tray with hole's upper area of 7.5 cm sq. and a depth of 9.3 cm. In practice, the choice of trays is relatively free, as long as the size is suiting for your cuttings. For cuttings, you can use mixed matrix of peat and perlite (volume ratio: 3:1), or you can use pure peat. Don't need to use rooting powder or other medication before cutting. Similar to other plants, humidity is the key to the success of cuttings, which are usually watered once a day in northern China in greenhouses.



supplemental figure 2 the cuttings stage of *Chrysanthemum morifolium*

Generally, the cuttings would take 4-5 weeks to root and need transfer to large pots after the roots had grown throughout the holes of the tray (supplemental figure 2). We used pot which diameter is 21cm and depth is 15cm. As with trays, the choice of pots depends on your money and labor. The pots we use are cheap and lightweight, and you can buy them on any shopping site, but they break easily.



supplemental figure 3 Transfer rooted cuttings to pots

The small flowered *C. morifolium* is ready to bloom around September. Special attention is paid to pruning the flower buds every 1-2 months in order to increase the number of flowers, so that more flower buds can sprout from the middle and upper part of the stem.



supplemental figure 4 small flowered *C. morifolium* in full bloom

During cultivation, pests and diseases are very common, the most common being various rusts and powdery mildews, as well as aphids and red spiders. For chrysanthemums, to control pests and diseases is to have **good air circulation and moderate humidity**. Second, the timely application of various drugs is also very critical. Due to the chrysanthemum has a strong vitality, it is not difficult to grow it alive. However, it is difficult to grow well and requires experience in cultivation.