

## Exploring Chinese Broccoli Cultivars

Skip Paul

Wishing Stone Farm

25 Shaw Road

Little Compton, RI 02837

(401) 591-0285

Skippaul@cox.net

For years I have visited real Chinese markets in Boston and New York and have always been in awe of the varieties, textures and make-up of their greens offerings. What really impresses a person is that the greens section area is often equal to the length of the entire vegetable section of a standard American grocery store. And they do not just have one sample of Bok Choi, but instead about seven different variations that clearly start with the Bok Choi genus.

The next step in my research was to look for these cultivars in your typical seed catalog. The pictures looked similar to what I saw in the Chinese store, but year after year, my attempt to grow them out and achieve similar results was met with many failures. Even calling directly to various catalogs, no one really had any basic knowledge of how these cultivars should be grown and what the main pit falls were. In 2015 our farm took about 14 different Chinese Broccoli varieties and spent a lot of time growing them to know the various cultivars and how they performed in different stages of the growing season.

The first discovery we made was that most of these delicate-stemmed varieties that are topped with broccoli-like immature florets are not grown like you would arugula or Broccoli Raab. Instead, they need a significantly greater space-- more like regular standard heading broccoli. The second most important cultural point is that the plants are treated and behave much like a cut flower. This means that the central growing point should be pinched off at an early stage of the plant's development and that sets the stage for an explosion of branches and side shoots that can keep going for months at a time. The third important point to keep in mind is that one must be constantly vigilant to keep the plant in a "vegetative state" and to avoid letting it deteriorate into the final expression of its "regenerative state." For those not familiar with these two terms: the "Vegetative state" of a plant's development is primarily occurring during its early growth period; this is when the plant is building not only its formal above ground body of early trunk and branches but it is also a time when the roots are developing a nutrient system to deliver the necessary nutrients when the plant starts its (later) "regenerative" or fruiting stage. This was probably the steepest learning curve because with these particular Chinese cultivars, once they have switched to the "regenerative state" there is no reversing the process. Anyone who has tried growing broccoli in the early spring will know what I am speaking about. In April the soil is cool and the plants are growing well; then suddenly you have a small spring heat wave and the broccoli planting suddenly grows florets in two days! And before you know what has happened, your entire planting has gone to flowers, and there is nothing in your power to reverse the process. This is particularly true when working with Chinese broccoli cultivars.

Another important observation we found was that certain varieties had enough similarities culturally, so that we ended up treating one group much differently than the other. Group 1 we called the "dark blue/green" varieties whose leaves were more the color of a typical Arcadia Broccoli. Group 2 we called the "light green/yellow~Pak Choi Type" varieties which were more

like Broccoli Raab in color and performance. Some examples of Group 1 dark blue/green varieties would be: Happy Rich (JSS), Guy Long (Seigers), and four varieties: Kailaan, Ryokuho, Suiho and Wan Shen from Kitizawa Seed Company, who was our biggest source of seeds. Finally, from High Mowing Seeds we trialed Te You.

Group 2 light green/yellow Pak Choi varieties included: Yo Choy Sum and Kosaitai.

It took us three seeding cycles before we figured out that the Group 1 variety of plugs acted much like standard broccoli plugs and were quite tolerant of holding in the hardening-off area, waiting for an appropriate day to be put in the fields.

The Group 2 light green/yellow varieties, on the other hand, were like many of the dwarf Bok Choi varieties, in that they did not like staying in a plug cell tray for much more than the third true leaf stage. They often would bolt before we got them to the field to plant! And like the discussion above, once they had made the shift to the regenerative state there was no chance they would be at all productive. Of the Group 2 varieties, we were able to grow out, they were only productive for 2-3 weeks. And during that period of production, we found we had to be vigilant about keeping them well watered and we could see the advantage of multiple foliar feeding programs to keep the delicate balance between the vegetative and the regenerative tendencies manageable! Another observation about the group 2 varieties was that the end of their production cycle was heralded by an increase in the stems lignin production; or more simply, they would get slightly woody and chewy, much like Broccoli Raab will get if you attempt a second cutting.

The summer 2015 was the worst drought in our thirty-year history! With this as a backdrop, we mostly focused on the Group 1 cultivars, which seemed much less needy in terms of our constant assistance and fertility maintenance. In September when the drought finally broke, the Group 1 cultivars did very well, allowing us to get two to four one pound bunches of healthy florets off each plant per week!

We would like to thank Johnny's seed breeders and reps who got equally excited about this project and provided us with timely advice and shared some seeds to experiment with! Especially helpful was John Narvona (their newest in-house seed breeder) who actually got us to expand our horizon into two other similar but different cultivar sidelines to the Chinese Group. Those were A, the European Overwintering Broccolis and B, the more modern cultivars for continuous small head production of "Broccolini" types.

The European Overwintering Broccoli has been around for many years but has fallen out of favor because it involves the extra work of taking the cultivar through a vernalization period or winter. In climates like England where the winters are mild, growers don't have to bother much with hoops and covers, which is not so in New England. However, the intrepid few that do take on this extra work are rewarded with broccoli floret production in March, April and May that has astounding sweet and delicate shoots. We tried several varieties: Santee was Johnny's offering in this sector, "Summer Purple" from Territorial Seeds was recommended for fall but we are going to trial it for as an Overwintering cultivar; De Cicco from High Mowing is another, and from Fedco Seeds, we are trialing Piracicaba and Purple Peacock Gene Pool; other varieties were from a seed bank in England, which are just numbered varieties. All these varieties were started September 2nd and finally transplanted out into raised plastic beds in late October. We wanted them to build a foundation root mass before we locked them up in hoops and .9 oz remay for their long winter's vernalizing nap.

Our second new focus is on broccoli varieties that are early-to-main season cultivars which are multiple-heading varieties. In an attempt to over-come the vicissitudes of spring broccoli going to seed during the first spring hot spell, we have explored using these "sprouting

broccoli varieties.” For the last two years, we have planted these varieties on raised black plastic beds with drip irrigation and have had good success. We think that the black plastic helps the roots stay warmer, thus they are better able to not be shocked into “regenerative” explosions of flowers in the event a hot spell occurs. Much like the Chinese cultivars, they seem to keep generating copious amounts of slender stemmed florets with quarter sized tight florets on top. One cultural detail we found useful for initiating the branching and floret expression was to pinch the top leader off about two weeks after transplanting, much like pinching a Zinnia flower to encourage lower level branching and flower development. These summer sprouting broccoli varieties seemed to respond to this redirection of the plant’s development. Some of the varieties we liked were: Fedco ~Purple Peacock Gene Pool & Piracicaba, Territorial Seed ~ Apollo and Summer Purple, High Mowing ~ De Cicco, and Johnny’s ~ Happy Rich.

In summation, there is a big universe of sprouting, Chinese and other broccolis that can bring in good sales, especially with the new awareness and health benefits of consuming a higher level of greens in the American diet.