

2014 Bach Planting and Research Calendar Results

The 2014 Bach Biodynamic Planting and Research Calendar focused on continuing the exploration into biodynamic approaches to sowing in accordance with cosmic influences that began with the 2013 calendar. The focus for the 2014 calendar was to look at the different synodic and anomalistic phases of the moon, and the effect that these phases had on the germination, growth and yield of vegetable crops. Seeds were planted during both waning and waxing phases of the moon. Additionally, seeds were sown on both apogee (when the moon is furthest from the earth during its 28 day synodic cycle), and during perigee, when the moon is closest to the earth during this cycle. Three outdoor planting trials took place over the months of April, May and June. The vegetables that were planted were radishes (April), lettuce (May), and bush beans (June). Sixteen seeds were planted at each of six different phases of the synodic cycle as follows: 3 days before a full moon, 2 days before a full moon, 3 days before a new moon, 2 days before a new moon, on apogee and on perigee (anomalistic cycle). The trigon days of each of the plantings (fruit, flower, root, leaf) was also recorded for each of the plantings, and the data from the harvest of all of the trials compared the efficacy of the different plantings to synodic, anomalistic, and trigon rhythms.

Additionally, a radish planting trial was conducted to investigate the effect of the April lunar eclipse. Lastly, early trials (radish trial 1) indicated that root crops might best be planted during waning phases, so a small trial was conducted with beets and turnips to further investigate this phenomenon. All of these trials will be further discussed later in this article.

The data in this year's trials has led me to the conclusion that the sowing of seeds is most effective at the following times:

Above ground crops- during a waxing phase of the moon
Below ground crops- during a waning phase of the moon
All seed types- perigee

The 2015 calendar will adopt this practice. It has been my intention in publishing this calendar that a collaborative research model could be developed, where the research indications of the calendar could be undertaken by a wide number of people from a wide geographic scope. This goal has unfortunately not been achieved. Even though there have been many thousands of visits to my website, and many downloads of the calendar, only one person partook in this year's research. All research is made more valid by larger amounts of data that confirm results of research conducted in the same way by different researchers. I hope that in future publications more participation will occur, giving larger data sets and thus giving the results more validity. Having said this, I have conducted the planting trials with vigour and an eye to detail, to ensure that the conclusions drawn from the data are as accurate as possible. I would like to thank Conradin Obrecht in Switzerland for his participation in this year's research.

Radish Trials

This first trial was conducted in two geographic locations more than 8,200 kilometers apart and similar results. The two graphs below show these differences (JB - John Bach CO - Conradin Obrecht). These trials were outdoor trials

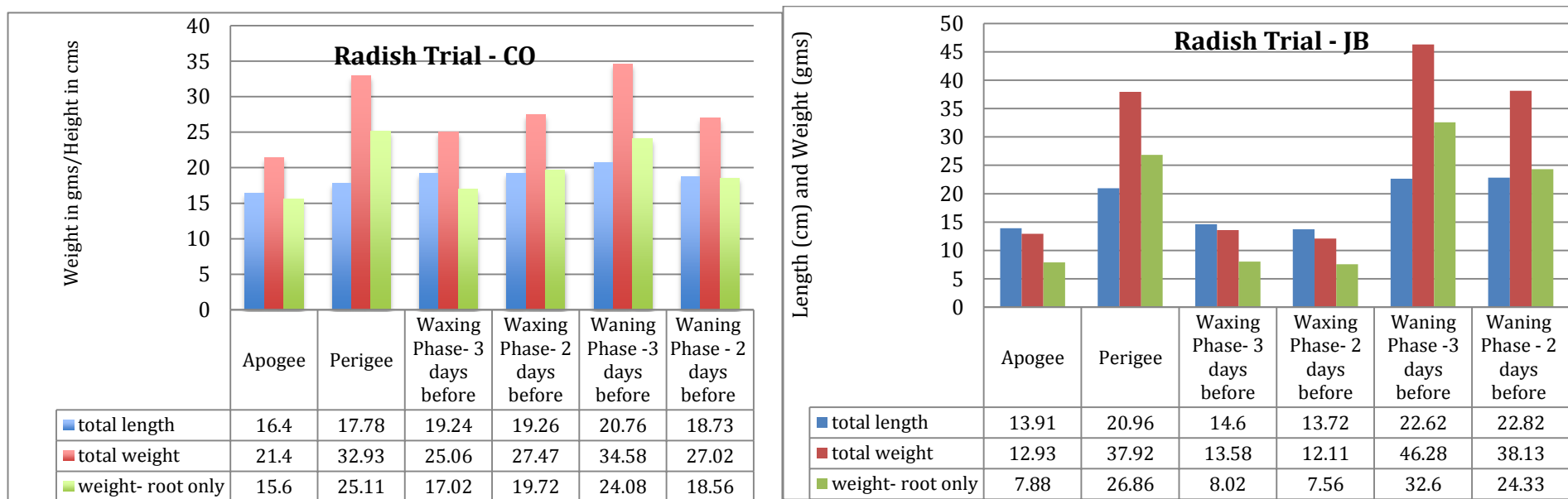


Table 1a: weights of the roots of each trial are given in the table below, from largest (in grams) to smallest.

CO- perigee (Apr 22)	25.11 grams	13.3 ° C	ascending	JB- waning (3) (Apr 25)	32.6 grams	13.7 ° C	ascending
waning (3) (Apr 25)	24.08 ° C	12.0 ° C	ascending	perigee (Apr 22)	26.86 ° C	13.2 ° C	ascending
waxing (2) (Apr 13)	19.72 ° C	9.8 ° C	descending	waning (2) (Apr 26)	24.33 ° C	13.9 ° C	ascending
waning (2) (Apr 26)	18.56 ° C	11.6 ° C	ascending	waxing(3) (Apr 12)	8.02 ° C	11.1 ° C	descending
waxing (3) (Apr 12)	17.02 ° C	10.0 ° C	descending	apogee (Apr 8)	7.88 ° C	10.5 ° C	descending
apogee (Apr 8)	15.6 ° C	11.0 ° C	descending	waxing (2) (Apr 13)	7.56 ° C	11.4 ° C	descending

Both of the data sets had the largest radishes in the perigee and waning (3 days before a new moon) phases, while radishes sown during apogee in both sets gave poor results. In the Swiss CO data set, 2 of the waxing and one of the waning sets produced average weights that were within 3 grams of each other. In the JB Vancouver data set, there is an enormous difference in the size of radishes sown in the waning/perigee phase as compared to those sown in the waxing/apogee sets.

This large discrepancy in Vancouver root weights between the perigee/waning radishes and the apogee/waxing radishes was in all likelihood partially due to cold weather in the first half of April, when the waxing/apogee radishes were sown, and warmer weather in the last half of April when the waning/perigee radishes were sown. I calculated the average temperatures for the first ten days of each of the trials, and have included them in the above table. In lecture one of his Agricultural Course, Rudolf Steiner stated "...with the forces that come from the Moon on days of the full Moon, something colossal is taking place on the Earth. These forces spring up and shoot into all the growth of plants, but they are unable to do so unless rainy days have gone before...the Earthly forces of growth are

feeble and unable to sustain plants. Through the forces of the Moon, the forces of growth are strengthened to the point where they can then become reproductive forces¹.” Here, with the growth of radishes in this trial, we must say that this has not been the case. Five of the six largest yields for radishes occurred during waning phases. Of these, two happened during perigee, which, in this trial occurred in a waning phase five days before a new moon. The first and most obvious factor that may have affected the results of this trial is the higher temperature that can be demonstrated with most of the larger radish yields, as seen in table 1a. Is it also possible, however, that radishes, and root crops in general grow better and larger during a waning phase, or could it be that other cosmic factors are at play?

In the 1980s and 90s, Harmut Spiess conducted large planting trials over several years to study the growth of different crops and found that different crops respond to different lunar rhythms². He not only found that plants respond to the synodic rhythm of the waxing and waning moon, but also to the anomalistic rhythm of apogee (when the moon is furthest from the earth) and perigee (when the moon is closest to the earth), and the draconian rhythm, where the moon ascends and descends in relation to the ecliptic (the sun’s path through the constellations over the course of a year). These three rhythms are each of slightly different lengths, and because of this, there are always different combinations of these rhythms working onto the earth that make it difficult (but I believe certainly not impossible) to determine which rhythm has the most beneficial effect on the growth of a given crop. With regard to radishes, Spiess found that the most important rhythms that affected growth were the draconian and anomalistic rhythms. Specifically, the best growth was related to perigee, and then to the ascending phase of the draconian cycle. I have included this information in table 1a. Five of the six radish weights occurred during ascending phases, and in the CO trial the best result was on perigee, and in my trial, the second best result was achieved on perigee. Apogee was associated with poor growth and lower root weights. To summarize the important data in this trial: best results were achieved during perigee, during a waning phase, when the moon was in an ascending phase, and when temperatures were warmest. It is commonly known that cold temperatures negatively affect the germination and subsequent growth of seeds. It is also important to note that during this trial a lunar eclipse occurred. Last year, I found that seeds sown within 48 hours of a lunar eclipse had both poor germination and growth. In my Vancouver trial, the radishes sown 2 days before a full moon (waxing 2) were the smallest of the trial. Also, because of the time difference between PST and UT the eclipse in Vancouver occurred 7 hours later than in Switzerland, and because of this they were planted only 31 hours before the eclipse occurred, well within the 48-hour window where seeds should not be sown.

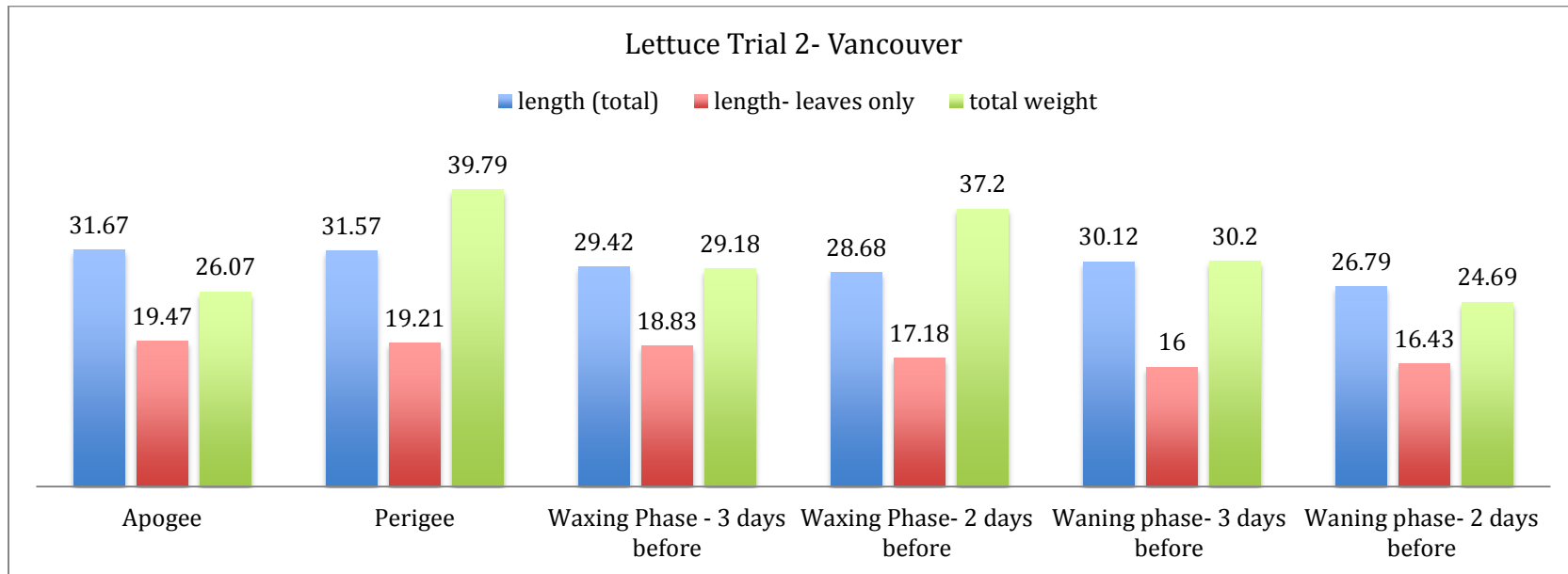
Tr 1 waxing (3)	7.12 grams	ascending	Tr 2 waxing (3)	2.3 grams	ascending
waxing (2)	21.89 “	ascending	waxing (2)	7.3 “	ascending
perigee	18.69 “	ascending	perigee	12.19 “	ascending
waning (3)	12.68 “	descending	waning (3)	6.68 “	descending
waning (2)_	15.66 “	ascending	waning (2)_	15.66 “	ascending
apogee	6.68 “	descending	apogee	6.68 “	descending

¹ This series of lectures, given in 1923 is available at www.rsarchive.org for free.

² http://www.forschungsring.de/fileadmin/ibdf/pdf/spiess/spbd00_01.pdf

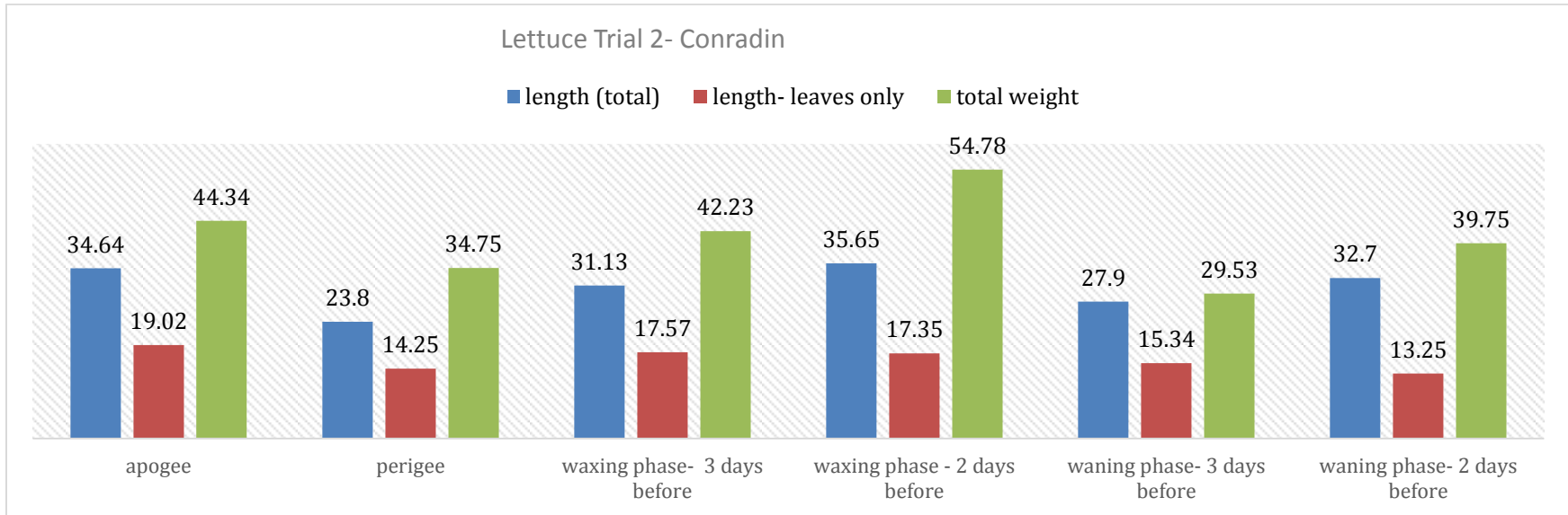
Lettuce Trials

The second trial for the 2014 calendar was an outdoor lettuce trial in May. I planted a fast growing variety of lettuce, and germinated the seeds indoors in my solarium and let them grow with a combination of artificial and natural light for the first 17 days. The solarium is attached to the main house, and maintained a temperature between 15-20 degrees Celsius for all of the lettuce trials. The Swiss trials were all sown directly outdoors. The results for both trials are shown both graphically below. The Vancouver trial demonstrated clearly an almost perfect growth distribution for what I believe to be the best and worst planting times for above ground crops. The results show perigee again giving the largest yields, then followed by the waxing phase 2 days before a full moon. The poorest results were for the waning phase two days before a new moon, and apogee. The waxing and waning phases 3 days before full and new moons were almost the same. By contrast, the Swiss data gave somewhat different results.



For above ground crops, I would expect the best yields during the waxing and perigee phases of the trial, and the poorest results during the waning phase of the trial and apogee. As expected, the Swiss waxing phases yields were both good, and the waning phase yields were poor by comparison. What surprised me was the apogee yields were second highest in the trial, and the perigee yield was second lowest, only ahead of the waning trial three days before a new moon. To what could the good apogee and poor perigee results be attributed? I speculate that the poor perigee results were obtained again because of temperatures during the first days of sowing, but in this case, I believe the temperatures were too high. The daily highs for the first three days of the perigee trial were 26, 26 and 28 degrees Celsius. I have been trying to grow lettuce indoors under light, and in the summer most of these trials failed, as the combined heat of the house and the lights used for the trial often exceeded 30 degrees Celsius. Under these conditions, I found lettuce germination to be very poor. By contrast, the highs for the first three days of the apogee trial were 20, 20, and 19 degrees Celsius, ideal for lettuce. This is, of course, only speculation to explain what I consider to be unexpected results. In the winter months, as I write this, I am planning some indoor planting trials where temperatures and light levels can be controlled precisely. The high outside

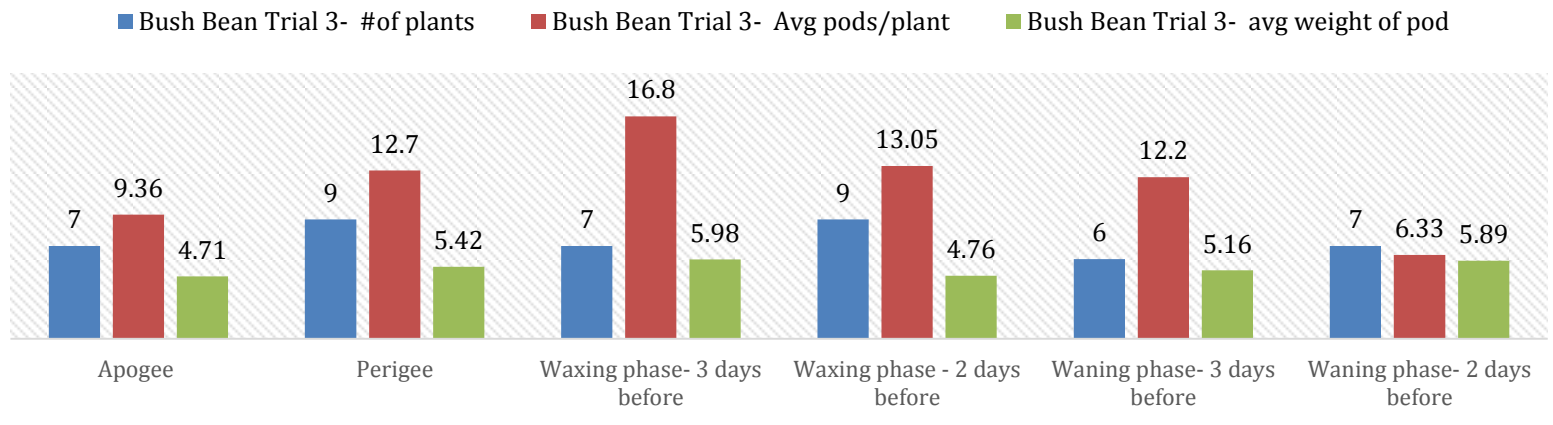
temperatures of the summer are no longer affecting indoor temperatures, and I plan on conducting a six month indoor trial of both lettuce (above ground), and radishes(below ground), to see if regular patterns emerge under well controlled trials.



Bush Bean Trial

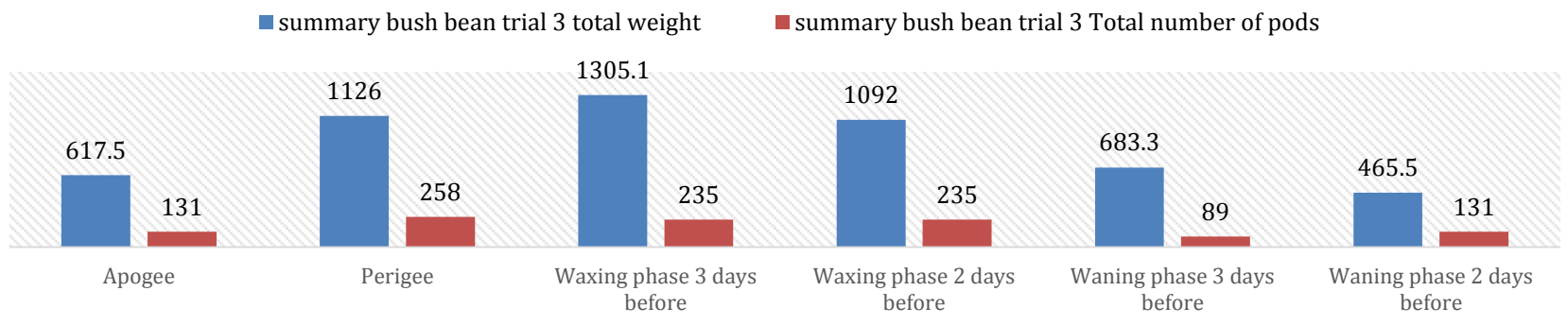
The final trial of the 2014 calendar was conducted in May of 2014. My data set is the only one conducted for this trial. The weather for the duration for this trial was very close to ideal, with temperatures generally staying within a range of the low to mid 20s for daytime highs and between 12 and 15 degrees Celsius for night-time lows.

Bush Bean Trial 3- Averages



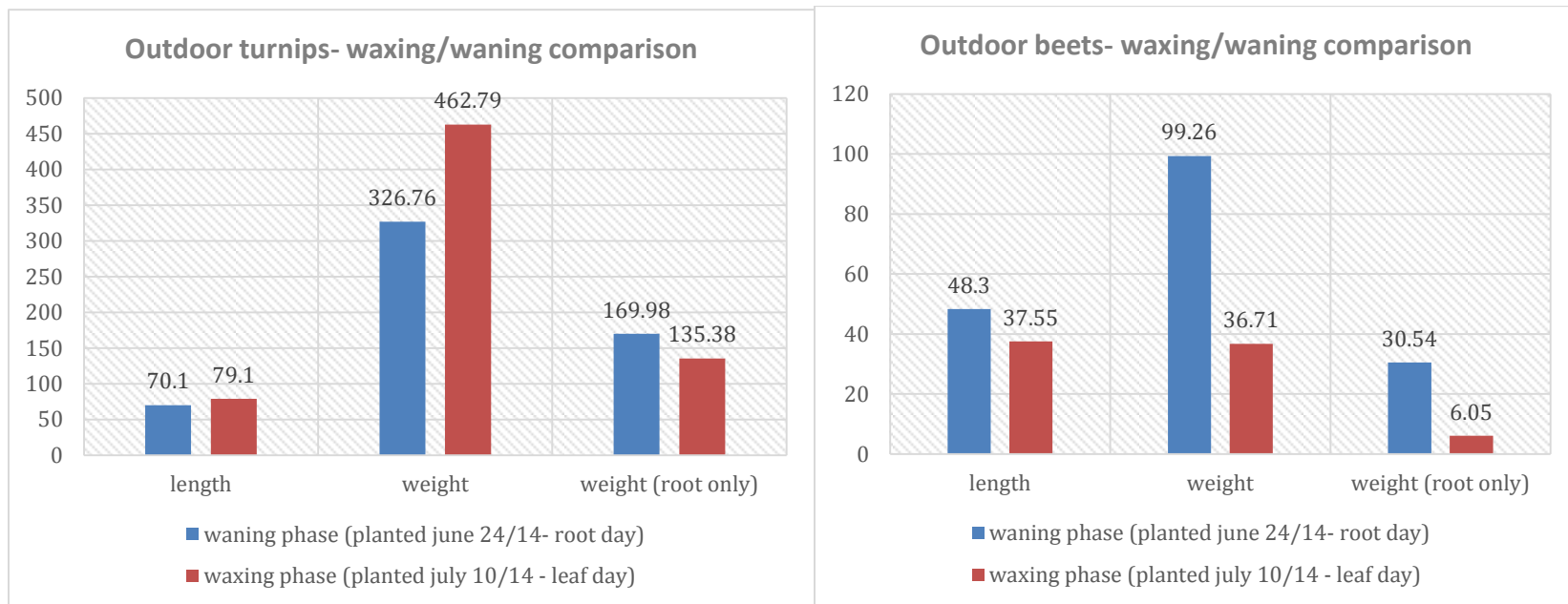
Most of the data in this set also fits with the picture of cosmic influences that has been developed through the research of Harmut Spiess. The per plant data averages showed the waxing sets with the highest numbers, as did perigee, and the lowest numbers in apogee, followed by the waning sets. These numbers become more pronounced when the total for all of the plants are given. This data shows the numbers of plants that made it to maturity. Not only did the perigee and waxing sets yield higher numbers per plant, they also had somewhat better survival rates, and were less susceptible to damping off. Interestingly, the average weight per pod was similar for most of the trials. Instead of producing high numbers of smaller pods, the plants of the apogee and waning phases produced fewer pods, but of similar size to the waxing and perigee plants. Also of note is that perigee in this trial occurred during a waning phase (5 days after the full moon). This implies that perigee is a benefit to all plant growth, regardless of whether it occurs in a waxing or waning phase. Perigee should be considered a good time to plant both above and below ground crops. It is also important to note the moon in its draconian rhythm was at close to its highest ascending point (in Gemini) at perigee, indicated by Spiess as being a favourable planting time for beans.

Bush Bean Trial 3 -total weight and number of pods



Outdoor Beet and Turnip Trial

The results of the April radish trial which showed higher yields during a waning phase were intriguing to me, so I decided to see if the same result would occur with other root crops. I planted 25 turnips and 25 beets on June 24/2014, two days before new moon, and then again on July 10/2014, two days before full moon. The temperatures for the months of June through September were very uniform, as mentioned above, and provided ideal conditions for research. I had earlier constructed two identical planting boxes, each 8 feet by 4 feet, and filled them with composted horse manure from the same source for each of the planting boxes. The first ten beets and turnips in each row were harvested after 75 days. The results of the trial confirmed the earlier results of the April radish trial, with both beets and turnips giving larger root yields during a waning phase.



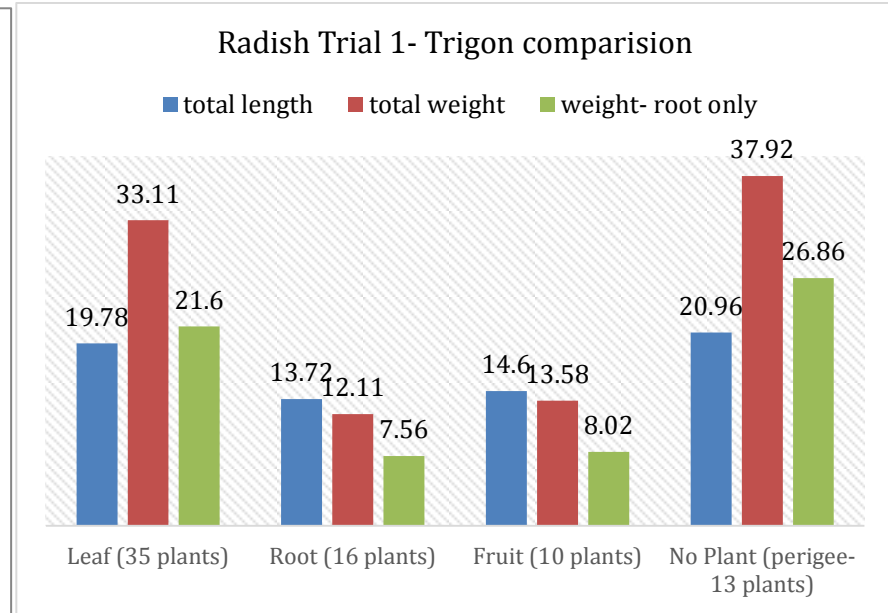
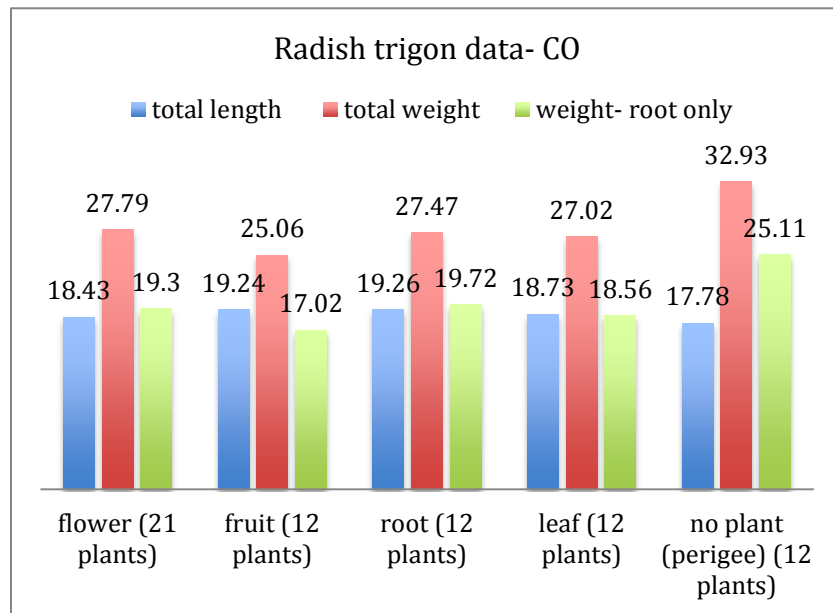
Also of interest was that the total weight of the waxing phase turnips was larger than that of the waning phase turnips, but the roots of the waning phase turnips were larger, implying that during a waning phase lunar forces of growth are directed to the root of a plant, while during a waxing phase, lunar forces are directed to the above ground portion of the plant. This was also seen in the beet trial, to a lesser extent, where the total weight to root weight for the waning trial was 2.75:1, and for the waxing trial was 5:1. The waning planting dates in this trial occurred during a descending lunar phase, and the waxing planting dates occurred during a ascending phase. Beets and turnips were not part of Spiess research, so there is nothing with which this data can be compared.

Trigon Data

All of the data presented above has been framed in the context best planting times in relation to the synodic waxing and waning lunar rhythm, and also the anomalistic rhythm, where apogee and perigee have been studied. This data can also be studied in the context of the planting approach of Maria Thun, where the moon's passage through the zodiac is used to determine best planting times. Over the years, Thun developed a theory that plants grew and developed differently when the moon was in one of the twelve zodiacal constellations. She grouped the twelve signs of the zodiac into four trigons (a trine is a 120° angle, formed, in this case, between the different constellations). As the moon travels through these four trigons, each with three constellations, different crops are grown by type. The groupings are as follows:

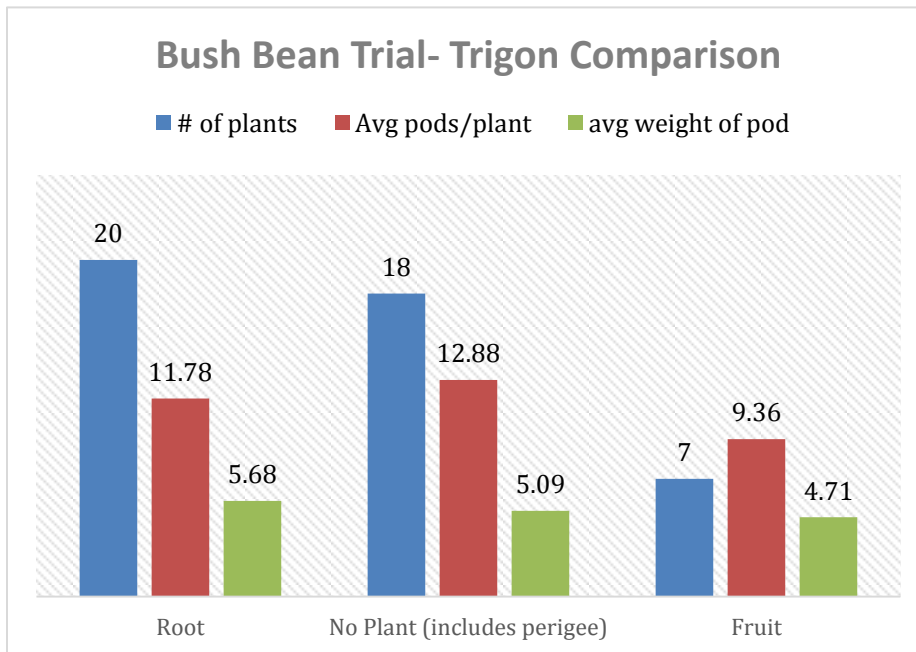
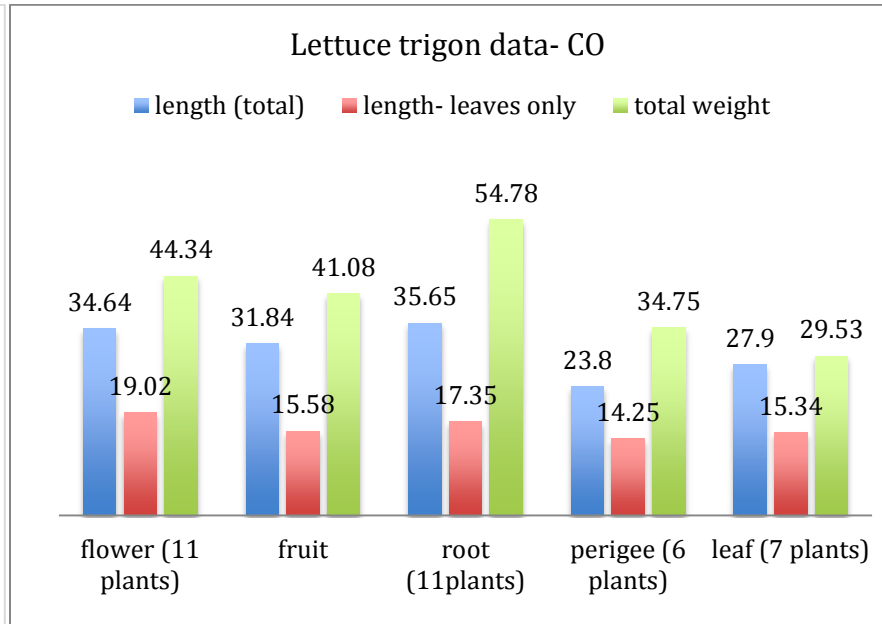
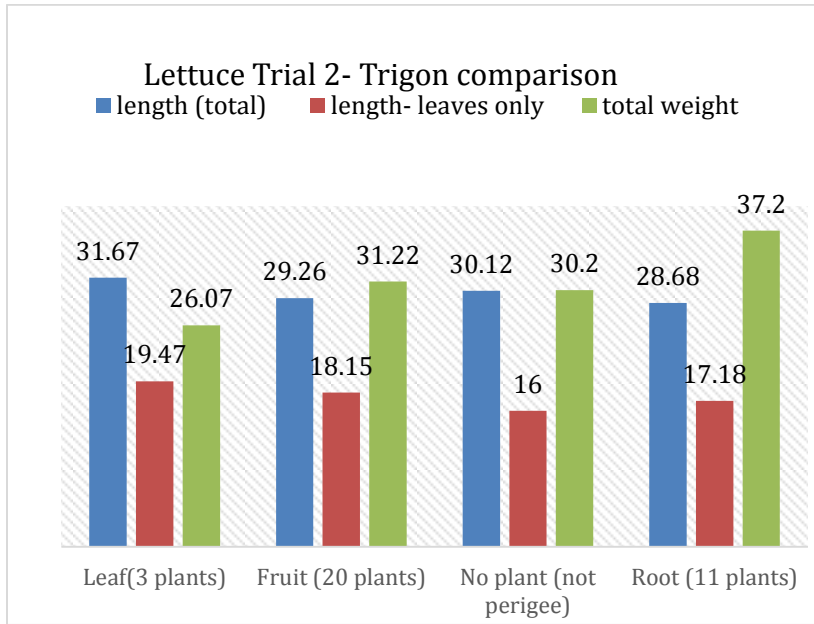
- Root crops (Earth element): Taurus, Capricorn, Virgo
- Leaf crops (Water element): Cancer, Pisces, Scorpio
- Flower crops (Light element): Gemini, Aquarius, Libra
- Fruit/Seed crops (Fire/warmth element): Aries, Leo, Sagittarius

The data from the three trials in this year's calendar can be presented according to the different trigons.



Both of the data sets for the April radish trial show the no-plant perigee time as the best for this crop. For the CO Swiss data set, the root day came third, and for my data set, the root day was last. For my data set the leaf day was second, while for the CO data set, the flower day came in second. In this data set there is a lack of consistency with the associated trigon for the crop planted. The data

suggests, as mentioned above, that the cosmic factors most strongly associated with strong radish development and growth are related to the anomalistic cycle (perigee), and the waning moon of the synodic cycle. The poor root day for the Vancouver was also likely affected by colder temperatures, as well as by an impending lunar eclipse, as was discussed above.



The trigon data for the May lettuce trial interestingly showed long leaf lengths in my Vancouver trial, but the total weights for the plants was the lowest for the entire group. This was also the case for the Swiss trial, where the weights on a leaf day were the lowest of the entire group. I believe that these low numbers can be attributed to planting during the weakest phase of the anomalistic phase cycle for the Vancouver lettuce (apogee), and the weakest phase of the synodic cycle for above ground crops (just before a new moon). The low apogee number for the Vancouver trials surprised me, as apogee occurred during the waxing cycle, but was eight days away from a full moon. This data does not suggest an inverse relationship to trigon planting times and yields; it simply suggests that when a favourable trigon planting time is used during an unfavourable planting time in either the anomalistic or synodic lunar rhythms, there is no beneficial effect. This implies that trigons do not affect the

germination of seeds and the subsequent growth of plants significantly.

This pattern is again present in the bush bean trial that I conducted in June. As mentioned above, the temperatures during most of this trial were ideal for outdoor growing. The trigon data for bush beans again shows that the favourable trigon day (fruit) was not able to give the impetus to strong growth when the seeds were sown during a poor anomalistic phase (apogee), and also a fairly weak synodic period (three days after a new moon. Based on this information, and on the data from last year's trial, I have concluded that trigons are ineffectual in their influence on the germination of seeds and the subsequent growth and yields of plants. The number of plants that I have used to come to this conclusion is small, and I will continue to study all calendar sowing methodologies to gather further data through planting trials. However, this data does not stand alone, and confirms work conducted by Harmut Spiess and by Walter Goldstein and Bill Barber.

Conclusions and Future Directions

The data from this year's work has changed my approach to planting below ground, or root crops. In last year's calendar, I recommended that all sowing is best done during a waxing phase. Based on the data from the radish trial and also from the turnip/beet trial, which both showed better results in a waning phase, I am now going to recommend that below ground crops be sown two or three days before a new moon. I will research Spiess' recommendation to plant carrots in a waxing phase (three days before a full moon, moon in Virgo) in the 2015 calendar. This year's results have shown that perigee is a good planting time for all crops, with some of the best yields occurring with plantings done on the day of perigee. In the 2015 calendar, perigee and the day before perigee will be designated as 'all plant days'. A waxing phase where perigee occurs close to a full moon should be considered as the best planting time for above ground crops, and a waning phase where perigee occurs close to a new moon should be considered as the best planting time for below ground crops. In 2015, I will broaden my research to cover a wider variety of crops, to determine if the advice given here is applicable to all crops, or whether cosmic influences are more crop specific. Also, I will continue to study the affects of the draconian rhythm, which was started in the 2014 calendar. The complete excel data sheet with all of the data sets used in the graphs of this report can be found on my website at www.bachbiodynamics.com. This report will also be included in the 2015 calendar, which can be downloaded for free, also on my website.

Any comments or questions can be sent to me via e-mail at jbbach1@yahoo.ca, or on the blog section of the website.