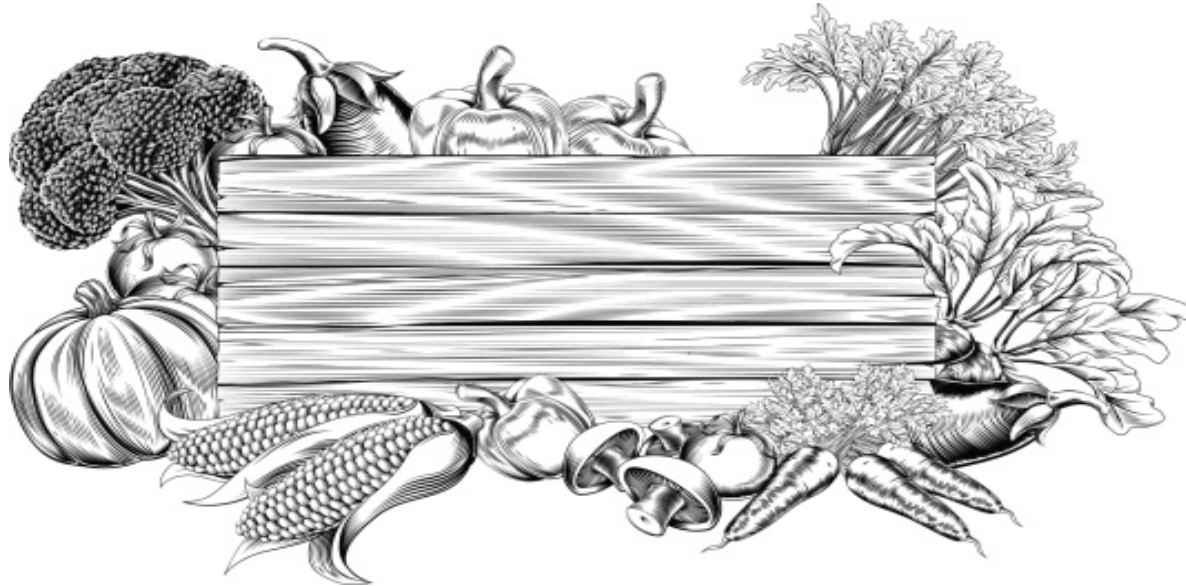


THE BACH BIODYNAMIC RESEARCH AND PLANTING CALENDAR

Based on indications given by Rudolf Steiner



2017

Introduction

Welcome to the 2017 edition of the Bach Biodynamic Planting and Research calendar. This year's calendar will continue to investigate the various lunar and cosmic rhythms that affect the germination of seeds and subsequent growth and vitality of plants, based on indications given by Rudolf Steiner in his 1923 agricultural lectures.¹ In particular, the waxing and waning 28-day cycle of the moon (the synodic cycle) and the periods when the moon is closest (perigee) and furthest (apogee) from the earth will also be studied. This rhythm is known as the anomalistic lunar cycle. Previous trials in this calendar have demonstrated that perigee offers one of the best times to plant, and that planting two days before a full moon, as advocated by Rudolf Steiner in his 1923 lectures also is of benefit to above ground crops. Previous research has tentatively shown that planting below ground crops may best be done during a new moon. This year's calendar will not advocate planting root crops two days before a new moon based on 2016 research results. This will be discussed in more detail in the research section of this calendar.

Additionally, this calendar also contains the dates when the planets are in their ascending phases. Steiner spoke in his 1923 agricultural lectures, which form the foundation of the biodynamic movement, of how the planets have a significant effect on the growth of plants. The inner planets, Venus and Mercury, affect the growth of short-lived annuals, and the outer planets affect the growth of longer-lived plants, specifically those with rind or bark. Steiner gives the following examples:

If someone wishes to plant an oak, it is of no little importance whether or no he has a good knowledge of the periods of Mars; for an oak, rightly planted in the proper Mars period, will thrive differently from one that is planted in the Earth thoughtlessly, just when it happens to suit. Or, if you wish to plant coniferous forests, where the Saturn-forces play so great a part, the result will be different if you plant the forest in a so-called ascending period of Saturn, or in some other Saturn period (p. 108).

An ascending planet is one that is moving from the horizon towards mid-heaven (the point directly above you). With respect to shorter-lived perennial crops (blueberries, raspberries, grapes, etc.), I believe the best combination for growing these plants would be to plant seed in a waxing lunar phase (ideally two days before a full moon) with an inner planet (Venus or Mercury), or ideally both, ascending. The ideal combination for planting fruit trees from seed would be to do so when Venus and Mars are both ascending, during a waxing phase. As most fruit trees today are started from grafts, the question as to whether this is also a good time to graft is one I cannot answer, as Steiner did not give direct indications regarding grafting. The following table shows the dates when the planets are in ascending phases this year (northern hemisphere).

¹ Steiner, R. (2004). Agricultural Course, The Birth of the Biodynamic Method. Eight Lectures given in Koberwitz, Silesia, between 7 and 16 June 1924. Rudolf Steiner Press. These lectures can also be read online at www.rsarchive.org.

| | |
|---------|---|
| Mercury | Mar 9-Apr 3; Jun 22-Jul 22; Oct 9-Nov 25 |
| Venus | Jan 1-12 |
| Mars | Jan1-Feb 1 |
| Jupiter | (rising from Western horizon) April 8-Jul 6 |
| Saturn | (rising from Western horizon) Jun 18-Sep14 |

Because of the addition of ascending planetary phases to this calendar, and the corresponding research that supports ascending planets as an aid to plant growth (see research section), the dynamic of planting times using this calendar is quite fluid. For example, apogee has been clearly demonstrated as a poor planting time in the research that I have conducted. However, if apogee occurs on or close to two days before a full moon, the affect of the full moon will still be of benefit to plant growth, but not as affective if the full moon had occurred close to perigee. The same can be said of ascending planets, particularly Mercury, which has a positive influence on annuals and bi-annuals as indicated by Rudolf Steiner. Therefore, combinations of the moon waxing, being close to perigee, or Mercury and Venus in ascending phases should all be considered favourable planting times. The table below gives a summary of best planting times:

| | |
|------------------------------|--|
| Two days before a full moon | All crops |
| Perigee | All crops |
| Mercury ascending | Annuals and shrubs (berries) |
| Venus ascedning | Shrubs (berries) and Fruit trees |
| Mars | Fruit trees and Oak trees (Steiner indication) |
| Saturn and Juptier ascending | Coniferous and long-lived trees (Saturn- Steiner indication) |

Planting times to aviod: apogee

Undetermined: two days before a new moon (more research will be conducted this year)

In the last two years, the new moon cycle has corresponded quite closely with perigee. The anomalistic cycle of apogee and perigee last 27.5 days, while the synodic full and new moon cycle lasts about 29.5. That means that the anomalistic cycle slowly retrogrades backwards through the synodic cycle. For this year's calendar that means that the perigee this year falls somewhere in the middle of the synodic cycle in between new and full moons, during the prime planting times of March through May. By about 2020, perigee will

January 2017

Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday

| | | | | | | |
|---|---|----|----|---|-----------------------|----|
| 1 Venus ascending until Jan 12 Mars ascending until Feb 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 Perigee-23:09 Excellent planting days Jan 9-10 | 10 | 11 | 12 full moon- 03:35 Venus ascending phase ends | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 Apogee-17:15 | 23 | 24 | 25 | 26 | 27 new moon- 16:08 | 28 |
| 29 | 30 | 31 | | | | |

Notes: All times in this calendar PST/ January 8-10 also offers an excellent time for starting raspberries, blueberries and other short lived perennials from seed.

retrograde into the full moon cycle, which will offer some extremely good planting times in the Northern hemisphere. It is interesting to note that the Southern hemisphere has been in an excellent planting cycle, with perigee occurring during the full moon cycle during what are the winter-late fall months in the Northern hemisphere. All times in this calendar are Pacific Standard Time (PST).

This calendar was always intended to be a collaborative effort, where those who downloaded it would also participate in one of more of the indicated trials. This has, unfortunately, not occurred, even though this calendar was downloaded about 20,000 times last year. Because of the lack of interest in participation I have decided not to include suggested trial times in this year's addition. This does not, however, mean that I am not interested in having people conduct their own research based on indications given in this calendar- I would most certainly welcome any research done by readers of this calendar. My suggestions would be to plant during favourable and unfavourable times as indicated by the calendar and then measure and weight the plants harvested. It is important that all plants receive the same amount of planting time, light and water, and that they be planted in the same soil. I have found planting in 4 x 8 feet garden boxes works well for this kind of research. Finally, it is also important to note any extremes in temperature that may happen. Early cold weather in particular can have a dramatic effect on later plant development. Extremes in temperature and pest damage have caused me to abort several trials over the last few years, as they created variables in the trials which made the data collected meaningless.

Pest Control Using Ashing

In lecture six of the Agricultural Course, Rudolf Steiner gave practical information on the biodynamic approach to dealing with pest control. This is done through the process of ashing, where the pest that needs to be controlled is burned in a small wood fire. These ashes are then spread over the ground in a process Steiner called peppering. Only small amounts need to be used, and can be spread over a wide area. Steiner spoke of how life forces live in the watery element, and the counter forces to these life forces live in the element of fire. Hence, when we burn a seed, insect or rodent, we create anti-life or anti-reproductive forces in the burned substance. These forces are then spread out over the garden or field when peppering takes place. These forces can be further magnified in a process called potentization, where one part of ashed substance is added to nine parts water, and the mixture is stirred rhythmically for ten minutes. Rhythmical stirring involves stirring one way vigorously in one direction to create a vortex (30 seconds in one direction is sufficient), and then stirring in the opposite direction for the same amount of time, again creating a vortex. In the transition from stirring from one direction to another, stirring should again be vigorous, so as to create a period of what Steiner refers to as 'chaos'. The creation of the vortex draws the necessary cosmic forces into the water/pepper mixture, and the chaos period infuses these forces

February 2017

Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday

| | | | | | | |
|----------------------|--|--------------------------|-----------------------------------|---|------------------------|--------------------|
| | | | 1 Mars ascending phase ends | 2 | 3 | 4 |
| 5 | 6 Perigee-07:00 Fair planting time | 7 | 8 | 9 Lunar Eclipse Feb 11- 03:43 No plant time Feb 9-12 | 10 Full moon- 16:33 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 Apogee-14:15 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 New moon-07:00 | 27 | 28 Ash winged insects | | | | |

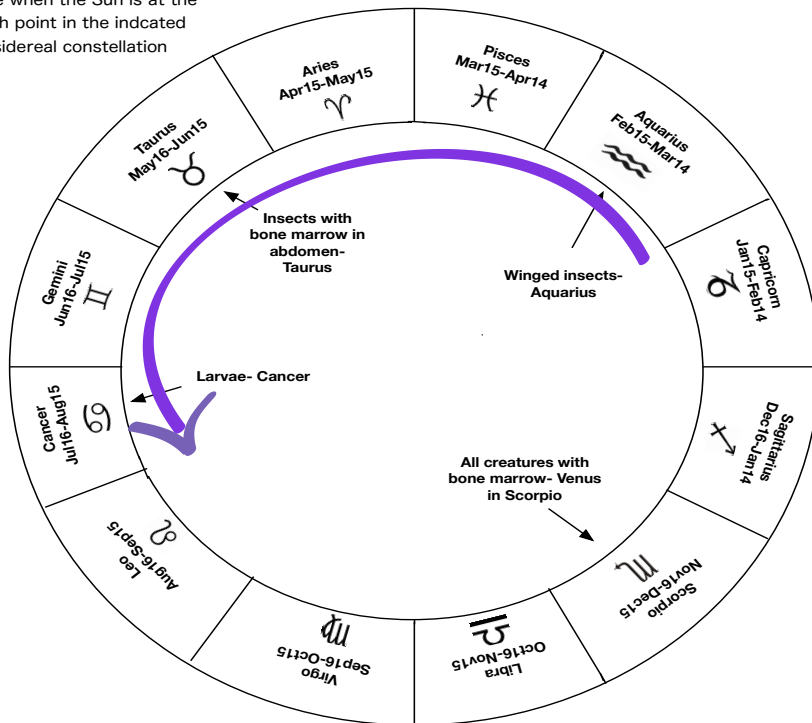
Notes:

into the mixture. After the first ten-minute stirring takes place, the first potentization has occurred (called D1). After this first stirring has been completed, one part of this D1 mixture is added to nine parts water, and the process is again completed to create the second potentization, D2. I then spray the nine parts of the D1 on the field or garden in the areas where pest control is needed. A backpack sprayer can be used for larger areas, and a simple cedar or fir branch can be dipped into a bucket, and then used to whisk the potentized substance onto the soil for smaller areas. This process is then repeated. I recommend stirring up to a D14. In her book *Agriculture of Tomorrow* (I believe to be the most important Agricultural book in the world) Lili Kolisko spoke of how the first seven potentizations work in the physical realm, the seven after that on the etheric realm, and the seven after that on the astral realm. For ashing of pests, it should not be necessary to work further than the ether (or life) body of an organism to create the desired conditions

where these pests will not want to inhabit the peppered or potentized area. This occurs from D7-14 in the potentization process.

Insect and Animal Ashing Chart (sidereal)

All Ashing for insects is done when the Sun is at the high point in the indicated sidereal constellation



It is, however, of paramount importance that the pest in question be burned at the correct time. In the case of insects, the timing of this correlates to the sun's passage through the constellations. Weeds should be ashed two-days before a new moon. The chart shows the progression given by Rudolf Steiner, where winged insects are ashed in the constellation of Aquarius, those with bone marrow in their abdomen (beetles) in Taurus, and larvae (I include slugs and snails in this category) are ashed in Cancer. The ashing takes place when the sun is in the mid-point of the constellation in question. The ashing for creatures with a bony system, with a spine and skeleton, is somewhat different. Here the creature should be ashed when Venus is in the sign of Scorpio. All of these dates are achieved by using a sidereal zodiac, which shows the true position of the sun as it passes through the zodiac. I have included all of the dates of the sun's high point through the zodiac in the table below.

| | |
|----------|----------|
| Aquarius | Feb 28 |
| Pisces | March 30 |
| Aries | April 30 |
| Taurus | May 31 |
| Gemini | July 2 |
| Cancer | August 3 |

Venus is in the high sign of Scorpio on Dec 9th-10th.

2016 Research Results

Planting trial 1

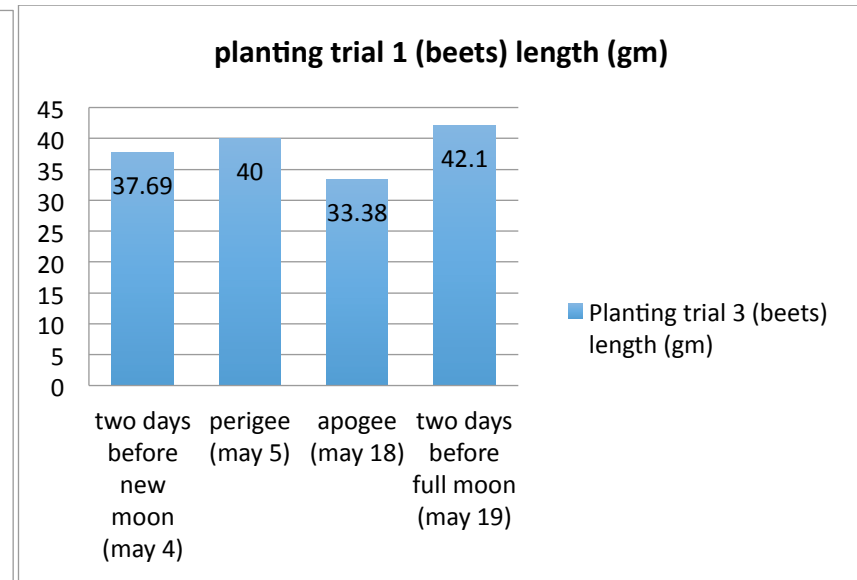
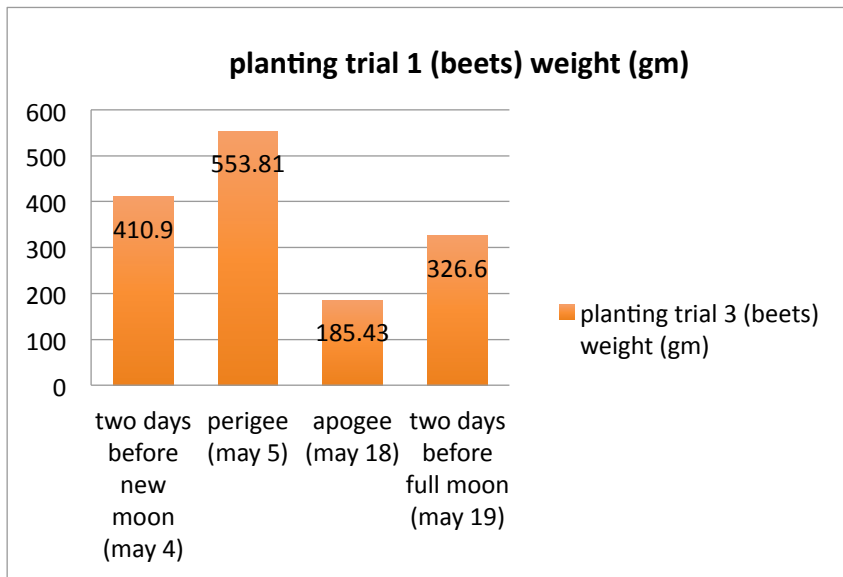
The first trial in 2016 was a beet trial conducted from May 4th (two days before a new moon) and May 19th, two days before a full moon. Here, a typical pattern for below ground crops resulted. The best weights for individual plants and for the total weight of all plants occurred at perigee and two days before a new moon. It is important to note that perigee, which in my research almost always gives higher yields, occurred one day before the new moon of May 4th, and in all likelihood positively affected the yields for the May 4th beet planting two days before a new moon. The total length of the plants in this trial mirrored the weights fairly closely.

March 2017

Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday

| | | | | | | |
|------------------------|----------------------|----|----|---|--|--------------------|
| | | | 1 | 2 | 3 Perigee-00:25 Good planting day | 4 |
| 5 | 6 | 7 | 8 | 9 Mercury- Ascending phase begins March 9- April 3 | 10 Excellent planting days- mar 9-10 | 11 |
| 12 Full moon- 07:54 | 13 | 14 | 15 | 16 | 17 | 18 Apogee-10:26 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 Solar Eclipse | 27 New moon-19:59 | 28 | 29 | 30 Perigee-05:40 Excellent planting day | 31 | |

Notes:



I have also included the total weights for this trial, but the data is here somewhat skewed, as the May 4th row was partially damaged by chickens. I have also included the total plants from each of the planting dates in this trial. There is a large discrepancy in the number of plants that survived to maturity in this trial. The 8 plants of the May 4th damaged trial reduce the usefulness of the trial, but it is interesting to note that the perigee May 5th trial, which had fewer plants than the plantings two days before a new moon and the apogee plantings, had much larger beets and as a result the total weight was greater than the other plantings with more plants. It is also interesting to note the large discrepancy in the apogee planting as compared to the planting two days before a full moon. These plantings were only one day apart, were from the same seed packet, and the rows were only 8 inches apart.

April 2017

Sunday

Monday

Tuesday

Wednesday

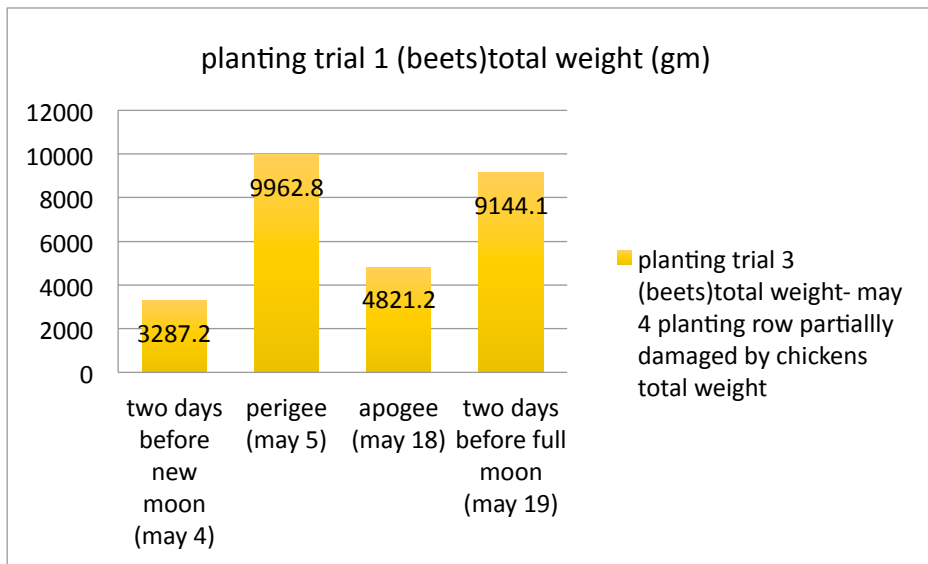
Thursday

Friday

Saturday

| | | | | | | |
|----|--|----|----------------------|--|----|---|
| | | | | | | 1 |
| 2 | 3 Mercury- ascending phase ends | 4 | 5 | 6 | 7 | 8 Jupiter ascending until July 6 Good planting day |
| 9 | 10 Full moon-23:09 | 11 | 12 | 13 | 14 | 15 Apogee-03:06 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 New moon-05:18 | 27 Perigee-09:19 Good planting day | 28 | 29 |
| 30 | | | | | | |

Notes: Plant long lives trees on April 8



| | |
|----------|-----------|
| May 4th | 8 plants |
| May 5th | 18 plants |
| May 18th | 26 plants |
| May 19th | 28 plants |

Past results of this calendar have found that apogee is a poor time to plant, and this has again been demonstrated by this data. It is also interesting that planting exactly two days before a full moon gave higher results, which was a specific indication given by Steiner. Previous research in this calendar has shown that planting exactly two days before a full moon does give higher results than planting even one day before. This has been very clearly demonstrated with apogee occurring three days before a full moon.

Planting Trial 2

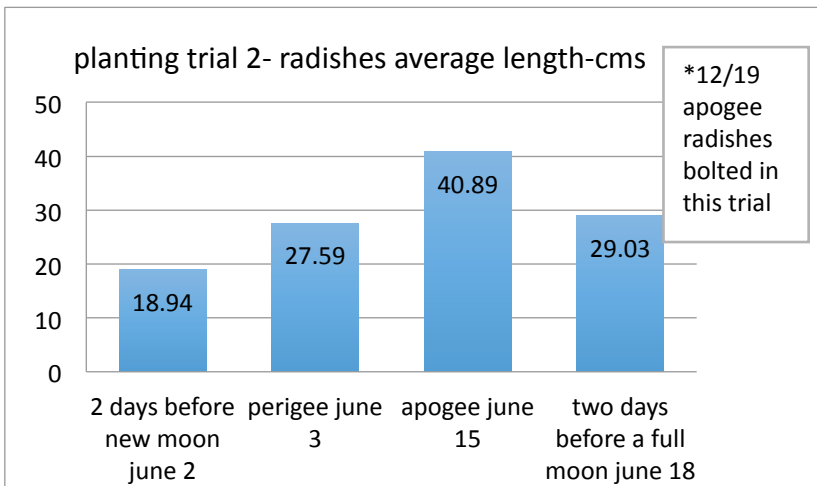
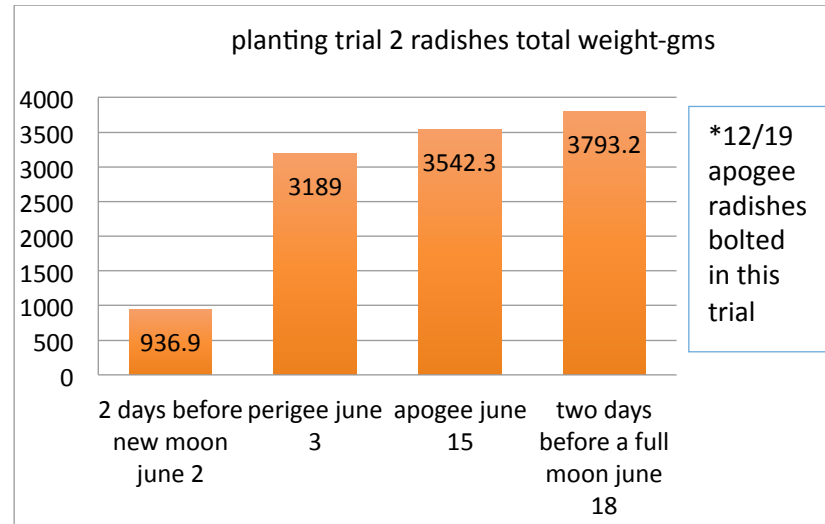
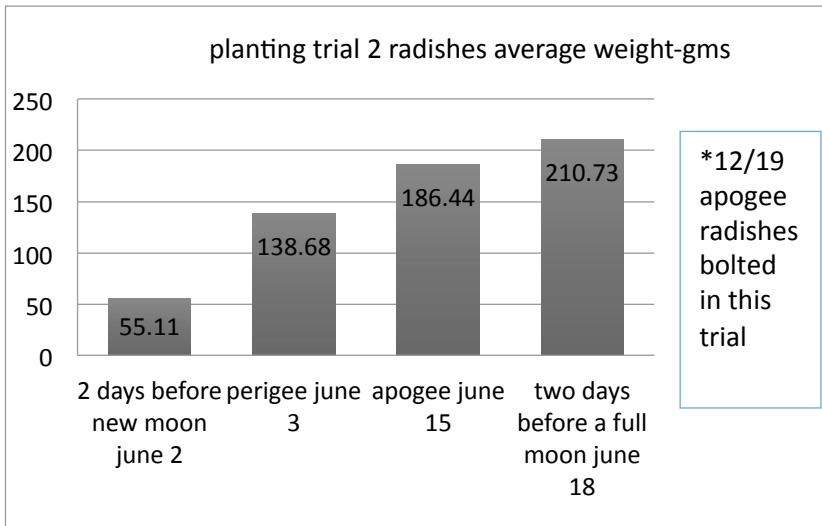
Planting trial 2 was a radish trial conducted from June 2nd to June 18th. What was of interest in this trial was that a high percentage of the radishes planted on apogee bolted (12/19- 63%). All of the trials that I conduct receive the same number of planting days, use the same seed, and receive the same amount of water.

May 2017

Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday

| | | | | | | |
|----|------------------------|----|-----------------------|---|--------------------|----|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 Good planting day | 9 | 10 Full moon-14:23 | 11 | 12 Apogee-12:52 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 New moon- 12:46 Perigee-18:24 Fair planting day | 26 | 27 |
| 28 | 29 | 30 | 31 Ash beetles | | | |

Notes:



All of the plants in this trial were in the same raised bed, but for some reason, the apogee radishes bolted at a much high rate than the radishes in other lunar phases. The bolting rates for the other plantings of this trial are as follows: June 2 - 1/17 (6%), June 3- 1/23 (4%), June 18- 2/18 (11%). The apogee radishes bolted at a rate of 63%, with the next highest rate being the June 18th planting which bolted at a rate of only 11%. This is a truly remarkable statistic. I have found that apogee is usually the weakest of planting times. With plants that take more time to mature, yields are almost always lower. But it seems with radishes, at least in this case, the plants wanted to bypass the root development stage and go straight to seeding. The heights of the apogee plants were, naturally, larger than for the other plantings, but the average and

total weights for the apogee plants was also high - second to the plantings two days before a full moon. But the radishes themselves were small, woody and inedible, as is the case when root plants bolt. When this is taken into account, the perigee and two days

June 2017

Sunday
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Thursday
Friday
Saturday

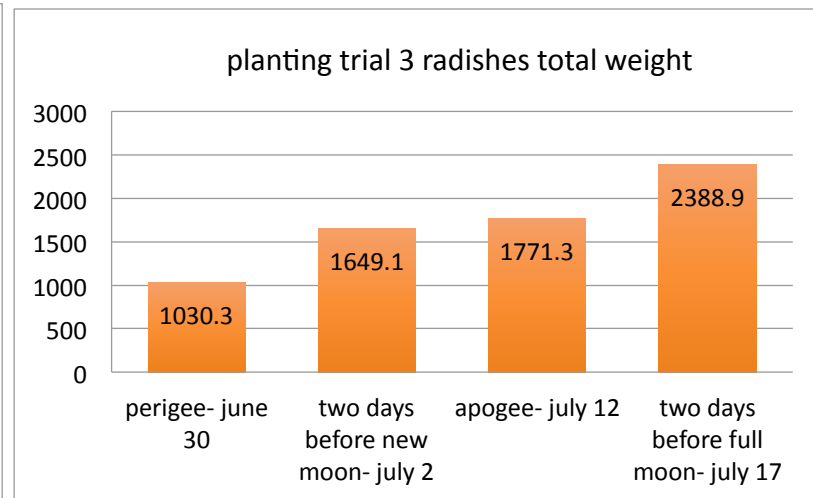
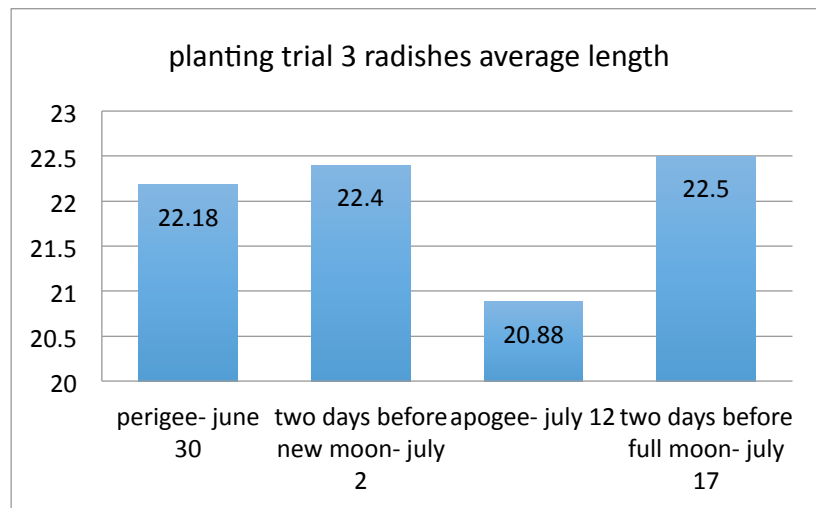
| | | | | | | |
|---|----|----|------------------------|--|--|----|
| | | | | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 Fair planting day | 8 Apogee-15:22 | 9 Full moon-06:11 | 10 |
| 111 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 Saturn ascending until Sept 14 | 19 | 20 | 21 | 22 Mercury- ascending phase begins(June 22- July 22) | 23 New moon-19:32 Perigee-03:50 Good planting day | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | |

Notes: Plant shrubs and berries (short lived perennials) and also conifers from seed- June 23

before a new moon results were the best. As with the previous trial plantings one day apart showed a huge variation. The plantings of June 2 (two days before a new moon) were much smaller than those of June 3 (perigee). The same seed was used, and the rows were only eight inches apart from each other. This result has also been demonstrated in previous trials. Planting on perigee and planting exactly two days before a new moon usually produce the best results.

Planting Trial 3- Radishes

Planting trial 3 was again a radish trial, which took place from June 30th- July 17th, using the seeds from the same package as in trial 2. This trial started only 12 days after radish trial 2 ended, but gave significantly different results. The apogee radishes did not bolt and were in fact quite healthy and gave the largest average weight per radish in the entire trial. The radishes in this trial were somewhat smaller because they were harvested after 35 days, were in the previous trial harvest took place after 44 days. I felt that I harvested the radishes in trial 2 a little bit later than I should have.



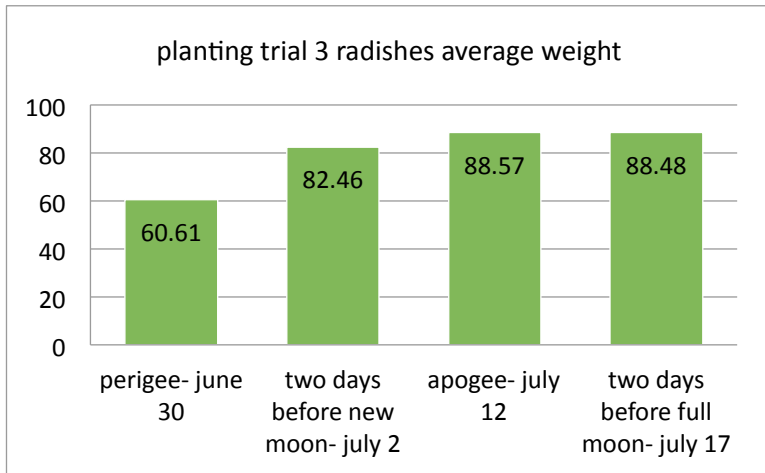
Also of note was the smaller size of the radishes in the perigee plantings. The radishes were well formed, healthy and quite edible, but were that smallest radishes of the trial, both in average and total weight. By contrast, the radishes for the two days before full

July 2017

Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday

| | | | | | | |
|----------------------|----|----|-------------------|---|--|--|
| | | | | | | 1 |
| 2 | 3 | 4 | 5 Apogee-21:28 | 6 Jupiter ascending phase ends Good planting day | 7 | 8 Full moon-21:08 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 Perigee-05:11 Good planting day | 22 *Mercury- ascending phase ends |
| 23 New moon-02:47 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | 31 | | | | | |

Notes: *Mercury here enters a phase where it hangs in its highest position until Aug 5, fluctuating slightly within an approximate 1 ½ degree range.



| Perigee (June 30) | 2days before new moon (July 2) | Apogee (July 12) | 2days before full moon- (July 17) |
|-------------------|--------------------------------|------------------|-----------------------------------|
| 17/30 | 20/30 | 20/30 | 27/30 |

moon planting were 46% larger

for average weight, and the total weight of these radishes was huge 232% greater than for perigee, and 34% larger than for the apogee radishes. Part of this is due to the high germination rates of the two days before a full moon set, where 27/30 radishes planted made it to the harvest date. The chart below shows the totals harvested for each planting of this trial. What could possibly explain this significant difference in results between these two trials? Firstly, weather as a

factor can be ruled out- the weather for the two trials was ideal- daily highs were between 18-24 degrees celsius and there were no cold spells during this time. I believe that the difference in the results for these two trials was due to the position of Venus and Mercury during this trial.

Both of these planets entered ascending phases part way through trial three. Venus began ascending on July 6th, and Mercury on July 8th. Rudolf Steiner indicated in the Agricultural lectures that the ascending phases of planets were very important, and should be considered when deciding the best time to plant. This was discussed above, in the introduction to this calendar, but bears repeating here. Steiner specifically spoke of how the “annual life of the plant-its limitation to a short length of life- is connected with those planets whose period of revolution is short” (p. 27). He also adds:

If someone wishes to plant an oak, it is of no little importance whether or no he has a good knowledge of the periods of Mars; for an oak, rightly planted in the proper Mars period, will thrive differently from one that is planted in the Earth thoughtlessly, just when it happens to suit. Or, if you wish to plant coniferous forests, where the Saturn-forces play so great a part, the result will be different if you plant the forest in a so-called ascending period of Saturn, or in some other Saturn period (p. 27).

In trial 3 both Mercury and Venus began ascending just before the apogee and full moon plantings- which gave the largest radishes and best germination rates. I began looking at these planetary ascending phases in the 2016 calendar, and will continue to do so in the future. I believe that these ascending phases can themselves make for favorable planting times when they occur, but more

August 2017

Sunday

Monday

Tuesday

Wednesday

Thursday

Friday

Saturday

| | | | | | | |
|---|---------------------------------------|----|--------------------|--------------------------------------|--|----|
| | | 1 | 2 Apogee-05:56 | 3 Ash larvae, slugs and snails | 4 | 5 |
| 6 Lunar Eclipse Aug 6 -21:20 No plant time Aug 6-9 | 7 Full moon-11:12 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 Perigee-06:16 Fair planting day | 19 |
| 20 | 21 New moon-11:31 Solar Eclipse | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 Apogee-04:26 | 31 | | |

Notes:

research will need to be conducted to confirm this. Based on the research that has been conducted this year, I have slightly adjusted my planting recommendations for favorable planting times. There are several variables that make up what constitutes a good planting time based on cosmic influences. Some were given by Steiner, and in the research that I have done, these have proven to be true, most of the time. These influences are that of the full moon (specifically two days before a full moon), and of the ascending phases of the planets (only one set of data). With regards to the influence of the full moon, I have found this effect to be most pronounced with above ground crops. I have, in the last two years, tentatively recommended planting below ground crops during a new moon. I have never been completely comfortable with this recommendation, and this year's results show that the influence of the new moon may not be beneficial to the growth of below ground crops. In trial 2 the poorest results for radishes occurred two days before a new moon. In trial 1 good results for the growth of beets was obtained in average weights and lengths of plants two days before a new moon, but there were only eight plants in this trial, as chickens that escaped from their enclosure ate many of the plants in this row. The remaining plants had more room to grow and less competition for soil nutrients, so I do not consider the data for two days before a new moon to be valid. In 2015 mixed results were achieved- carrots had good average weights but poor germination, which allowed for individual carrots to thrive with less competition. Bush beans also did well in a new moon phase in 2015, and good results were obtained for radishes during a new moon phase in 2015.

How can we explain the poor results this year with the trial 2 radishes? I believe that the positive results that have been obtained in the past two years for data two days before a new moon is the result of the influence of perigee. During the 2015 and 2016 growing seasons (March-August in the northern hemisphere), perigee occurred just before the waning moon cycle; often perigee would occur two or three days before new moon. I have almost always found that perigee was a strong time to plant and produced good germination and average weights per plant. One of the only times this has not occurred was in trial three this year. In this trial all of the planting dates produced good results, which I believe was due to the occurrence of Mercury and Venus ascending at the same time- a truly powerful impulse for plant growth. This occurred after both perigee and two days before a new moon, which excluded these two planting times from the beneficial influence provided by these ascending planets. The anomalistic month (perigee and apogee) is 27.5 days, while the synodic month (full and new moon), is two days longer at 29.5 days. This means that perigee retrogrades- slips backwards- versus the synodic cycle. Last year perigee was just before a new moon in the spring. This year that will not occur until late summer. I believe that in order for a cosmic influence to have an effect on the synodic cycle it must occur *before* a new or full moon. In trial 2, perigee occurred the day *after* the two days before a new moon planting. The ascending phases of Venus and Mercury occurred several days *before* the apogee and full moon plantings. Mercury was in an ascending phase until

September 2017

Sunday

Monday

Tuesday

Wednesday

Thursday

Friday

Saturday

| | | | | | | |
|----|------------------------|-----------------------|--|--------------------------------------|----|----|
| | | | | | 1 | 2 |
| 3 | 4 Good planting day | 5 | 6 Full moon-00:04 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 Perigee-09:05 Good planting day | 14 Saturn ascending phase ends | 15 | 16 |
| 17 | 18 | 19 New moon- 22:30 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 Apogee-23:51 | 27 | 28 | 29 | 30 |

Notes: Plant conifers from seed Sept 4

August 22 and Venus continued to ascend until the end of the year. Therefore, moving forward I will not ascribe two days before a new moon as a beneficial planting time for below ground crops. I will conduct a spring radish trial this year to test this theory more accurately. Also, perigee is before the full moon cycle this January, so I may try to conduct some indoor temperature controlled trials during this time to test this theory further. I have been working on developing an inexpensive way to test growth cycles using artificial lights and heat. Based on this year’s findings, the best planting times should be considered as those which happen two days before a full moon, on perigee, or during an ascending phase of Mercury or Venus for annuals and shrubs, and the outer planets for trees. The following chart indicates this information, parts of which still need more research in order to be confirmed, but will form the direction of this calendar in the future. This planting calendar is a research-based calendar, and its direction will be dictated by its research results. Best planting times:

| | |
|------------------------------|--|
| Two days before a full moon | All crops |
| Perigee | All crops |
| Mercury ascending | Annuals and shrubs (berries) |
| Venus ascending | Shrubs (berries) and Fruit trees |
| Mars | Fruit trees and Oak trees (Steiner indication) |
| Saturn and Jupiter ascending | Coniferous trees (Saturn- Steiner indication) |

Planting times to avoid: apogee

Undetermined: two days before a new moon

Trigon Planting Trial

This year I also conducted a planting trial to specifically test the effectiveness of the trigon method of planting developed by Maria Thun, and which is the method followed by almost all biodynamic calendars. My past research has shown that this method is not an effective predictor of plant growth and development. In simple terms I have found that it just doesn’t work. Most other researchers have also not been able to find a correlation between Thun’s trigons (the moon in various constellations) and the development of different parts of a plant (flower, root, leaf, fruit). The idea that constellations affect plant growth is also contrary to indications given by Rudolf Steiner in the *Agricultural Course*. In lecture six he said the following:

October 2017

Sunday

Monday

Tuesday

Wednesday

Thursday

Friday

Saturday

| | | | | | | |
|---|---|------------------------|----|----------------------|----|----|
| 1 | 2 | 3 Good planting day | 4 | 5 Full moon-11:41 | 6 | 7 |
| 8 Perigee-22:52 Good planting day | 9 Mercury ascending phase begins | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 New moon-12:12 | 20 | 21 |
| 22 | 23 | 24 Apogee-19:26 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 | | | | |

Notes:

Now that we are passing here from plants to animals [Steiner was discussing the issue of pest control], we come to the 'animal circle'- that is the Zodiac. It was not called so in a meaningless way. ***To attain our end in the plant world we can stop at the planetary system.*** For the animal world that is not enough. There we need ideas that reckon with the surrounding sphere of the fixed stars, notably the fixed starts of the Zodiac (p.113).

Why does Steiner indicate that in order to combat pests homeopathically we need to use the forces of the zodiac? This is because the zodiac bears the astral forces that are used by animals and human beings. Plants only have an etheric and physical body, where animals and humans both have an astral body, which gives them, among other things, a sentient constitution (the ability to have feelings and emotions, hunger, instinct, etc.). An argument has been made that in Steiner's lectures on bees that a reference is made to plants needing astral forces in order to help their development. In lecture 3 of *Bees*² Steiner speaks of how, in order for there to be an abundant nectar flow, there needs to be sunny weather when the sun is in sidereal Aries in early May (the sun is in sidereal Aries from April 15-May 15). This would seem to indicate that plant development is indeed influenced by the constellations. But here we must ask the question: what is the purpose of nectar? For the plant, nectar serves one purpose only- to attract pollinators. Without the need to attract pollinators, nectar is not needed, which is why plants which are airborne pollinators like grass (they use the wind to do their pollination) don't produce nectar. When we understand the purpose of nectar in this way, we can see that its purpose is related to attracting creatures with an astral body- birds and insects. I believe that nectar is used to attract insects that use their astral forces to find nectar, and that when we are talking specifically about the constellations and their relation to plants, it has to do solely with the production of nectar, a substance that needs the astral forces of the zodiac to attain its purpose.

Having said this, the trial that I conducted this year was one that took place over the course of 32 days from the end of October through mid November, with daily plantings. I have wanted to find, over the past several years, a quick growing plant that I could use for indoor planting trials over the colder months. I have found this plant in fall rye, which germinates very well (almost always 100%) and grows very quickly. I used a combination of artificial light and natural light in the solarium attached to my house. The artificial lights were connected to a timer and gave the plants ten hours of light per day. Nine fall rye seeds were planted in a small pot each day, and were allowed to grow for ten days. Each of the pots was given one watering at the time of planting, and then five days later. After ten days the plants were carefully taken from their pots and all of the soil washed from their roots. They were then

² Steiner, R (1998). *Bees- Lectures by Rudolf Steiner* Anthroposophic Press

November 2017

Sunday

Monday

Tuesday

Wednesday

Thursday

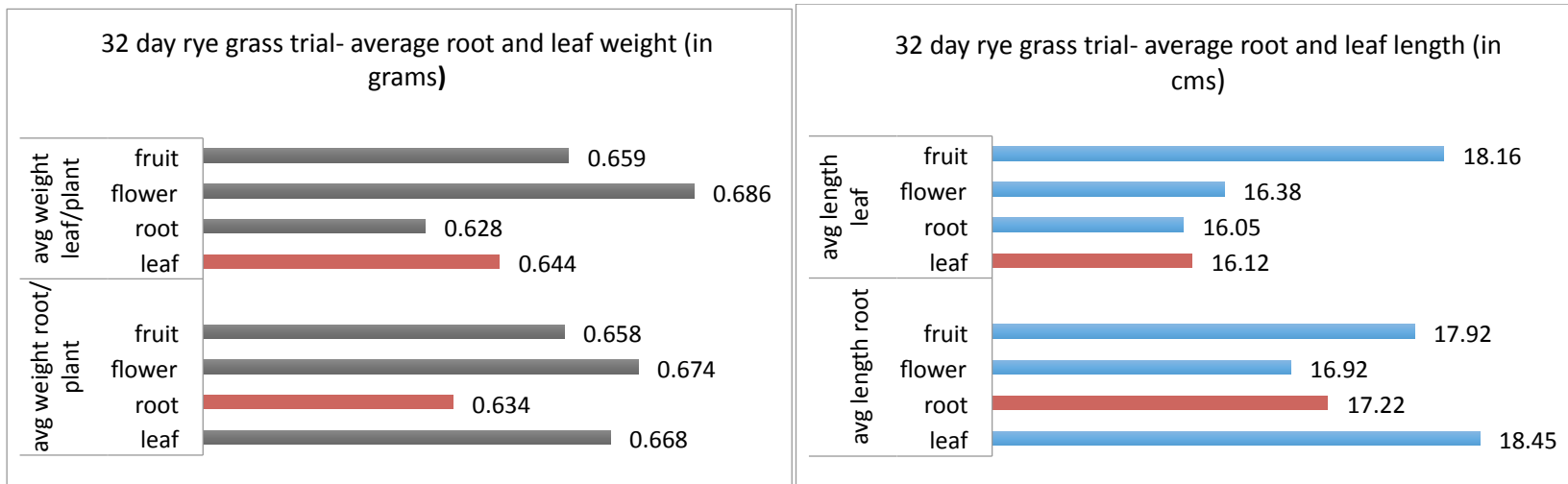
Friday

Saturday

| | | | | | | |
|--|----|--------------------|-----------------------------|----|----------------------|------------------------------------|
| | | | 1 Excellent planting day | 2 | 3 Full moon-22:24 | 4 |
| 5 Perigee-16:10 Excellent planting day | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 New moon-03:42 |
| 19 | 20 | 21 Apogee-10:53 | 22 | 23 | 24 | 25 Mercury ascending phase ends |
| 26 | 27 | 28 | 29 | 30 | | |

Notes:

laid on paper towel for ten minutes and then weighed and measured. Only the leaf and roots of the plants could be measured, as the plants were not grown to maturity, where they would have produced seed. According to the trigon method of planting, the plants sown on root days should have larger, more developed roots, and the plants sown on leaf days should have larger, more developed leaves and stems.



Number of plants per trial:

| Root | Flower | Leaf | Fruit |
|-----------|-----------|-----------|-----------|
| 63 plants | 81 plants | 72 plants | 69 plants |

From these graphs it can be seen that no correlation existed between the leaf and root development of rye grass over a ten day period and the corresponding trigon days. The leaf and stalk weights for rye grass planted on leaf days was .644 grams/plant, which was smaller than the corresponding flower and fruit days. The root weights were .644 grams/plant, which was also smaller than the corresponding flower and fruit days. The average leaf/stalk lengths for the plants planted on a leaf day was 16.12 cms/plant, which was smaller than the corresponding fruit and flower days, while the average root length of 17.22 cms/plant was smaller than for the corresponding fruit and leaf days. Out of the four data sets, the best results were achieved on flower days twice, fruit days once, and leaf days once. This trial in itself was quite small in nature, but when added to the previous research that I

December 2017

Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday

| | | | | | | |
|----------------------|--|----|----|----|-----------------------------|---|
| | | | | | 1 Excellent planting day | 2 |
| 3 Full moon-07:48 | 4 Perigee-00:43 Excellent planting day | 5 | 6 | 7 | 8 | 9 Ash rodents (creatures with a skeleton) |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 New moon-22:31 | 18 Apogee-17:28 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| | | | | | | 31 |

Notes:

have conducted, and that has also been conducted by other researchers, the Thun method of planting using trigons has not been demonstrated to be effective.

I do not make these statements lightly or to denigrate those who are involved with the publication of Thun calendars. I have done this research and made these statements because it is my sincere belief that Anthroposophy and the agricultural method of Anthroposophy known as biodynamics will have a crucial role to play in the near future if the world and humanity is to evolve in a spiritual way and avoid catastrophe. The environmental and spiritual movement that is developing around concerns of the use of chemicals and pesticides in our food and environment, global warming, and genetically modified food is opening an important window for the biodynamic movement and for Anthroposophy which will allow for this all important spiritual impulse to gain a stronger foothold in the world. It is essential that this opportunity not be missed. It is our responsibility as Anthroposophists and biodynamic practitioners to make certain that the methods that we employ, especially those like biodynamics that lend themselves to research in the physical world, are effective and backed by meaningful research whenever possible.

As mentioned above, it has been a disappointment to me that there has not been more research conducted around the issue of best planting times. When I developed this calendar it was my intent that it be a collaborative calendar where those who downloaded and read the calendar would also participate in some of the indicated planting trials that were suggested. This never happened. I have always enjoyed this work and will continue with biodynamic research, but more work needs to be done by other biodynamic practitioners, and by those who publish biodynamic calendars. The above ten day trial using rye grass was very simple to carry out, and could be conducted by anyone interested in this work. It could even be conducted in an apartment without land. It is my sincere hope that more research be carried out by a wider group in a collaborative effort to further research the issue of trigons and other lunar rhythms that are used by biodynamic gardeners and farmers.

Future Directions

In the coming years I will continue to conduct research into lunar and planetary rhythms and their effect on the growth of plants, but I will also be expanding my research to other areas of agriculture, looking at the concept of mulching and its influence not just on plant growth, but on soil health as well. This is an important aspect of the permaculture movement, and there are diverse views and

strategies on the best methods available. Of particular interest to me is the work of Paul Gautchi in Washington state, USA, who uses wood chips as a cover, and also the work of Ray Archuleta, who has developed a system that uses live cover which is then rolled flat and planted into. Those who are interested can click on the following links for more information:

Paul Gautschi's work: <https://vimeo.com/28055108>

Ray Archuleta's work: <https://www.youtube.com/watch?v=nWXCLVCJWTU>

I am grateful for the support that people have expressed in this calendar, and wish all who have an interest in the biodynamic method and with organic gardening in general a happy and successful 2017 growing year. If you have any questions/comments regarding this calendar, please do not hesitate to contact me at the email address below.

Sincerely, John Bach

www.bachbiodynamics.com

email: jbbach1@yahoo.ca