Analyzing Beekeeping in Aotearoa New Zealand: Changes in Climate, Calendars, and Culture

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New Zealand Beekeeping Calendar Analysis

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Report Submitted to:

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CALENDARS Project: University of Bergen

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CALENDARS Project: Massey University

Professor Leslie Dodson and Professor Kenneth Stafford

Worcester Polytechnic Institute

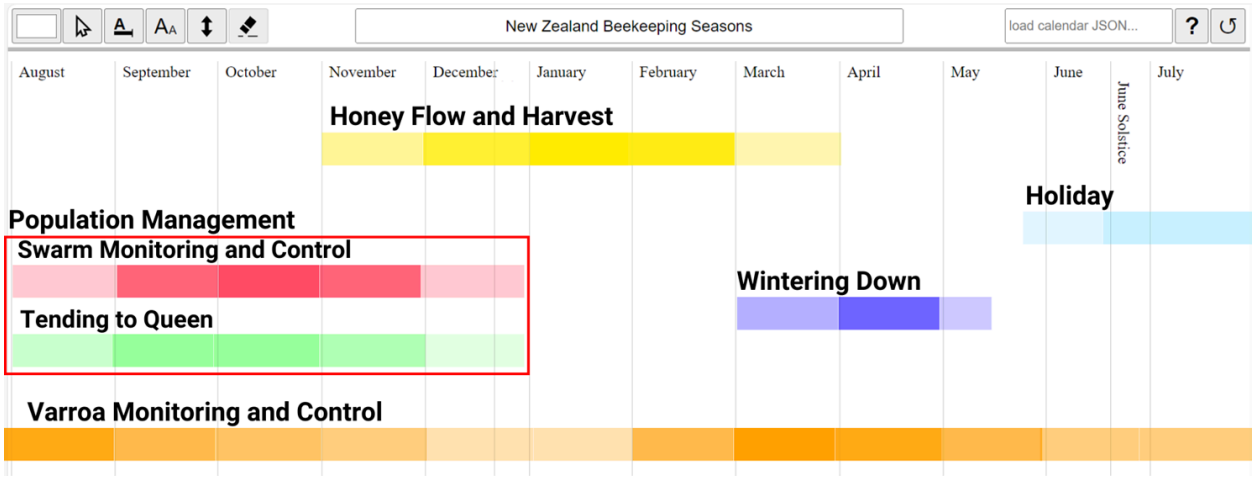
Calendar Analysis

We translated all of our hand-drawn calendars and verbal descriptions of calendars from interviews with beekeepers into the Calendar Tool, resulting in 14 sources of data for comparison. To do this, we color-coded each event beekeepers mentioned in their calendars and recreated them in the Calendar Tool based on this key. The data was analyzed from 10 hand-drawn calendars, two Calendar Tool submissions directly from interviewees, and two from verbalized descriptions during interviews. The coded calendar events came directly from our collected data, and the terms that were used varied greatly from calendar to calendar. The original, unedited hand-drawn calendars from key informants are in the appendix of our report and will also be turned over to the CALENDARS Project as raw data.

Color-Coded Calendar Events Key			
	Honey Events		**Brood events**
	Spring Build Up		**Queen events**
	Wintering Down		**Weather events**
	Swarming Events		**Feeding events**
	Supers and Boxes		**Varroa events**

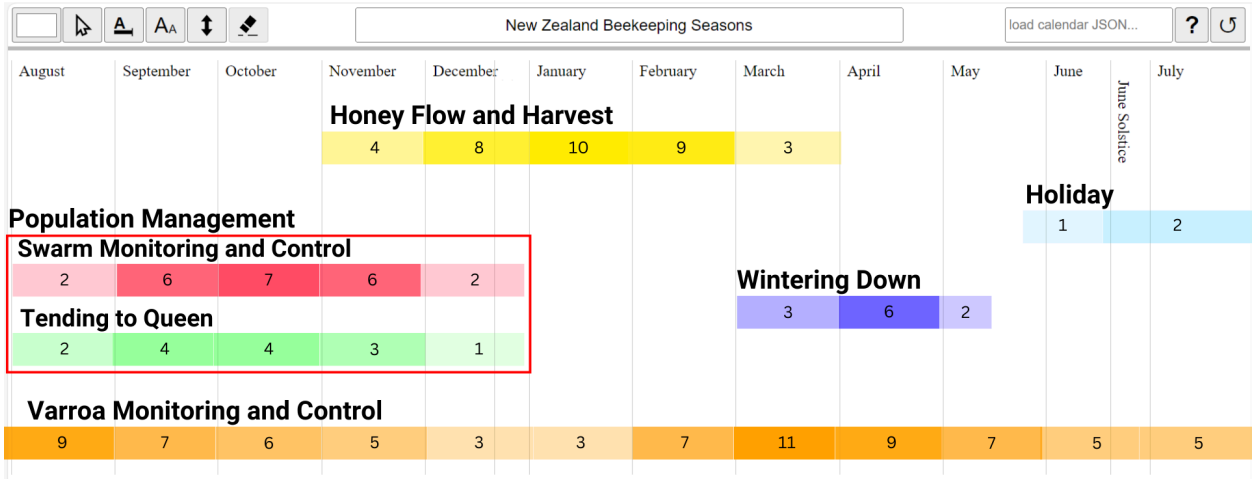
Overall New Zealand Beekeeping Calendar from Full Calendar Data Analysis

The four main seasons of New Zealand beekeeping:



Population management (Red & Green, outlined in Red), honey flow and harvest (Yellow), wintering down (Purple), and holiday (Blue).

The four seasons of New Zealand beekeeping with data:



Labeled by the number of responses for each event in any given month.

Analysis of New Zealand Beekeeping Calendar

We have discerned roughly four seasons in the calendars of New Zealand beekeepers. Much of the variations in the starting and ending points of the seasons come from different locations and microclimates throughout New Zealand, since we conducted interviews throughout the North Island and South Island. There was variation in what beekeepers determined an event to be, so we used those that were most frequently noted on calendars.

Many of our respondents noted the start of the beekeeping season on their calendars as the 1st of August. This start date correlates to the start of the "population management" season. While not all calendars noted this start date, it was the most common start date across all collected calendar data. Some calendars note January as the start date for their beekeeping year. A January start correlates to the beginning of the honey harvest.

New Zealand Beekeeping Seasons

1. **Population Management: August - November**

   The population management season marks the beginning of the beekeeping year in New Zealand. During this time, beekeepers deal with swarms and tend to the queen honeybee. Beekeepers monitor for swarms and split hives if necessary. They also check on the queen, requeen when needed, and make room for the queen to lay. There are lots of brood in the hive during this time as worker bees are created in preparation for nectar collection. Checks for American Foulbrood and treatment for Varroa mites also occur during this season, as treatments must be completed before honey harvest begins. These tasks are critical to preparing the hive for the upcoming honey season.

2. **Honey Flow: December - February**

   Bees produce honey throughout this time, and beekeepers harvest the honey towards the end of the indicated season when the honey flow slows. The honey flow season generally starts at the end of November and ends in March. Some beekeepers split the season into two sections for harvesting: a primary and secondary flow and extract. Many beekeepers consider the honey harvesting season to be the busiest season of their beekeeping year.

3. **Wintering Down: March - Mid-May**

   The wintering down season begins after honey flow stops and extractions are completed; it lasts from mid-March until early May. During this season, beekeepers are preparing the hives for the winter. They check the hive to ensure there is enough food for wintering over and feed if necessary. The queen stops laying, resulting in little to no brood in the hives over winter. Varroa mite treatments are often placed during this time after honey is collected.

4. **Holiday: Mid-May - July**

   After an initial check of food stores, beekeepers tend to go on holiday and have a break from their beekeeping duties. They will occasionally check on the beehive if they are around, ensuring there are still enough stores of food in the hives. After the holiday, the beekeeping year restarts with population management as the hive begins to build up in the springtime and prepare for the honey flow. While only two calendars explicitly indicated the “holiday” season on their calendar directly, many left a gap during this time, implicitly suggesting a break period. Additionally, many beekeepers verbalized in interviews that this was a holiday period.

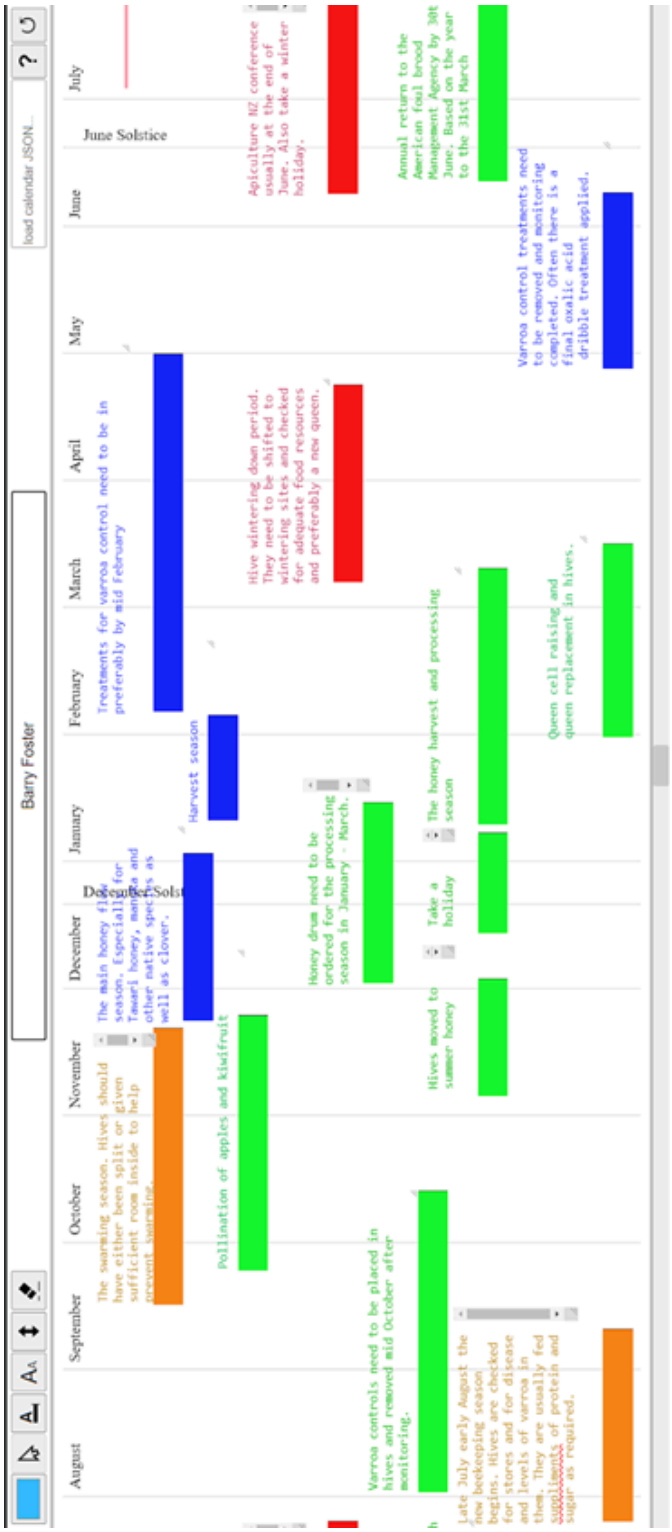
Calendar Data

Unedited Calendar Submissions From Key Informants

Frank Lindsay Calendar Tool Submission:

Edited Calendar Tool Submissions by Key Informants

Barry Foster Calendar Tool Submission (we extended the bars to the size of the textbox he created):

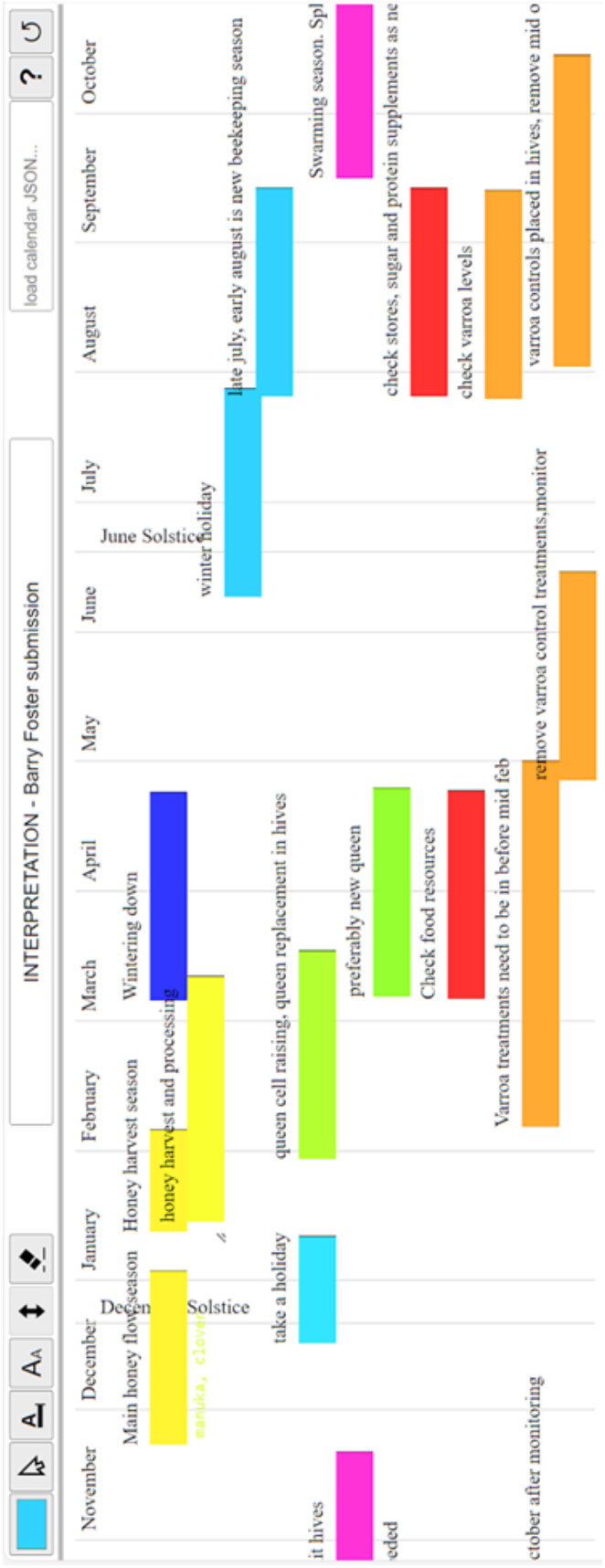


Alistair Little Calendar Tool Submission (we extended the bars to the size of the textbox he created and added the different colors):

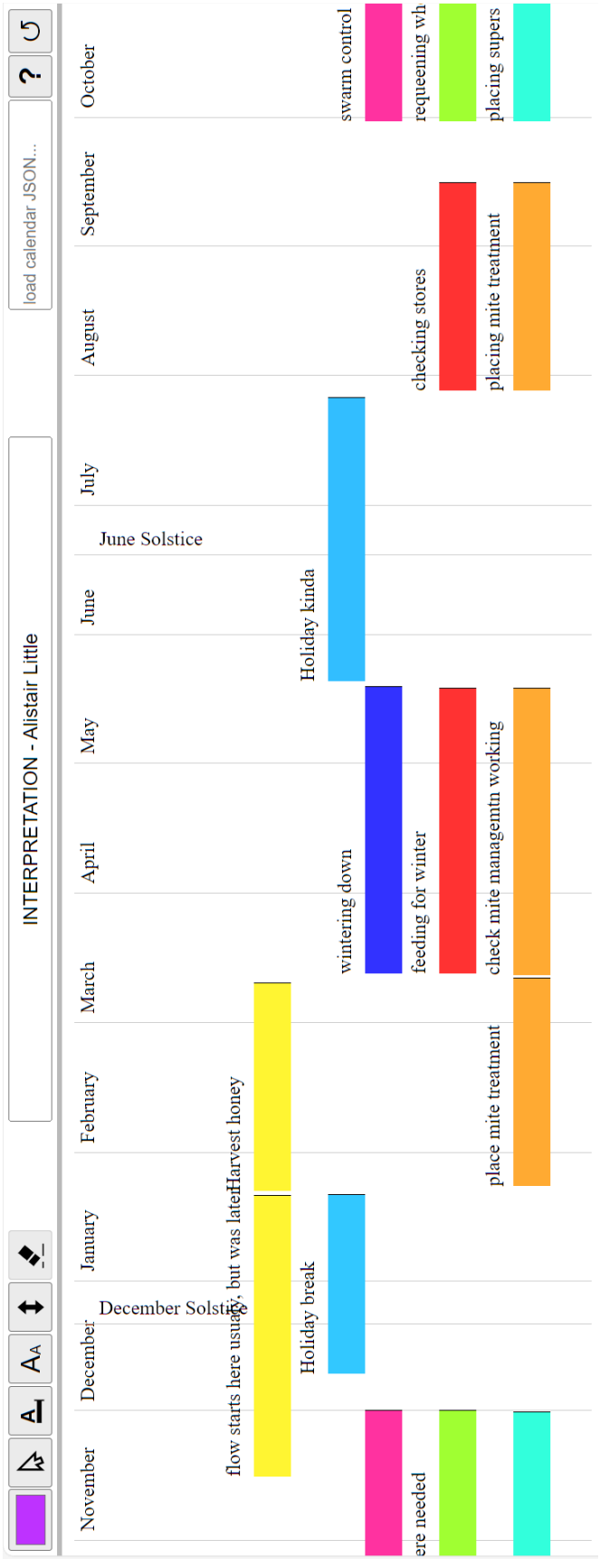
Interpretation of Calendar Data with Online Calendar Tool

Interpretation from Key Informant Calendar Tool Submissions

Online Interpretation of Barry Foster's Calendar Tool Submission:

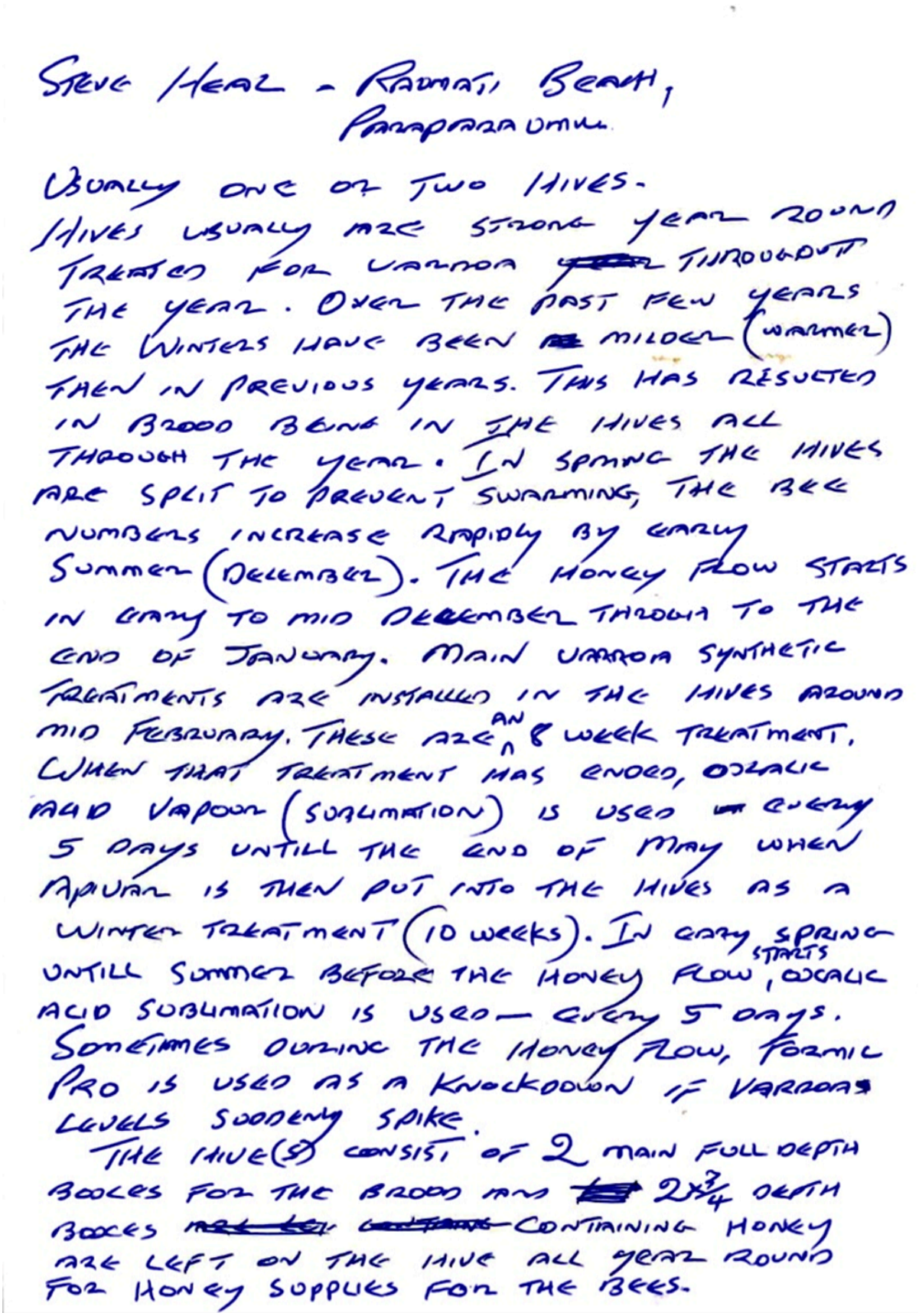


Online Interpretation of Alistair Little's Calendar Tool Submission:



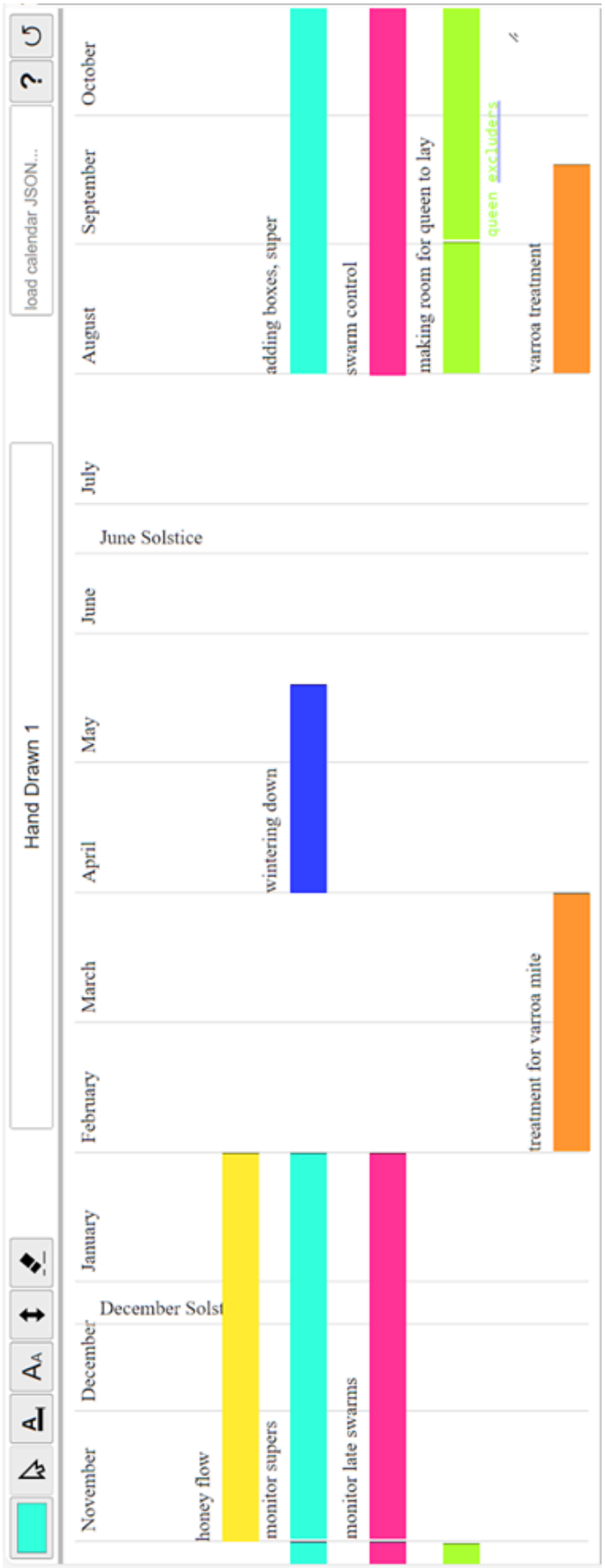
Hand-Drawn Beekeeping Calendars and Interpretations using Calendar Tool:

1. Steve Heal, Paraparaumu, North Island NZ

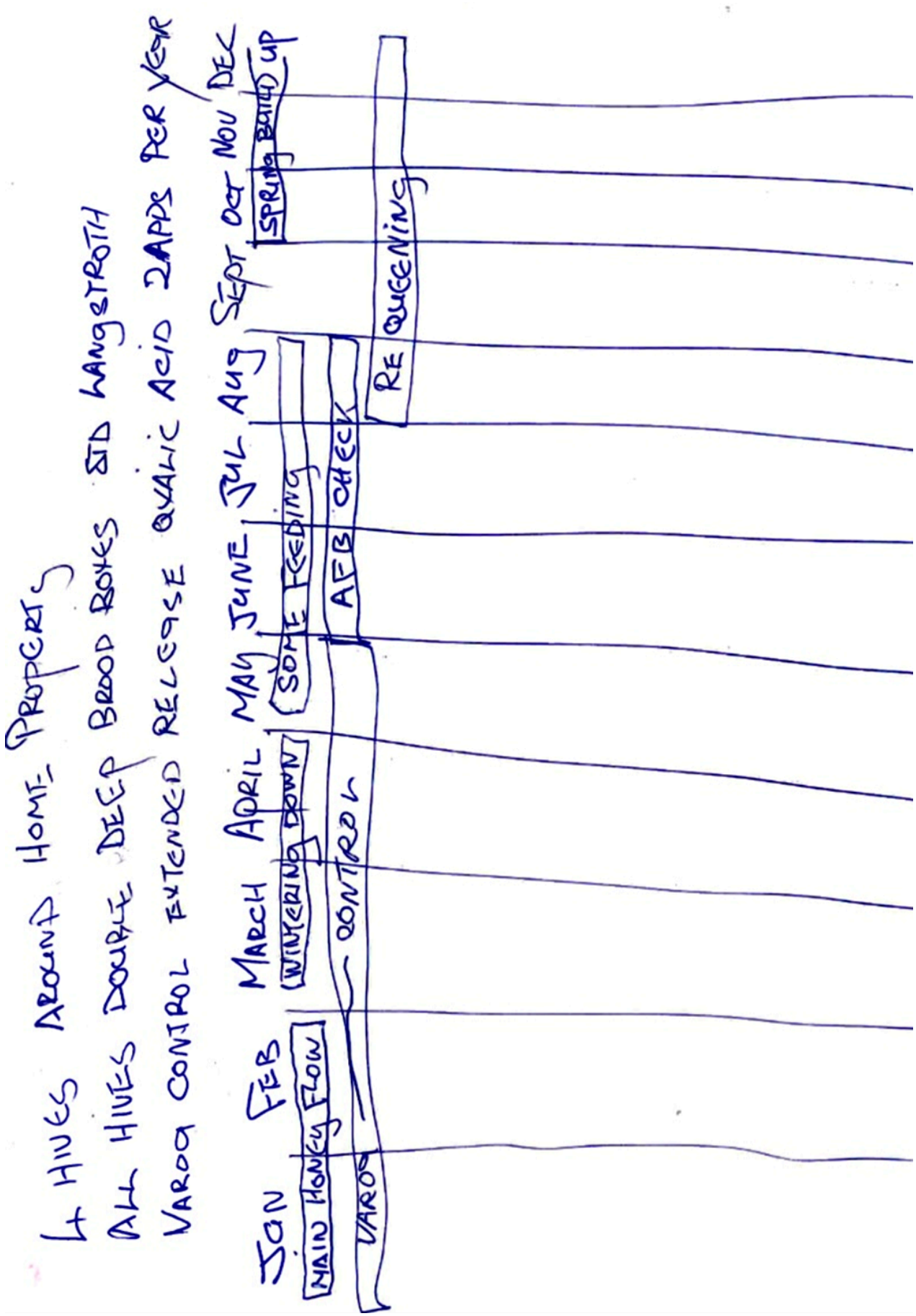


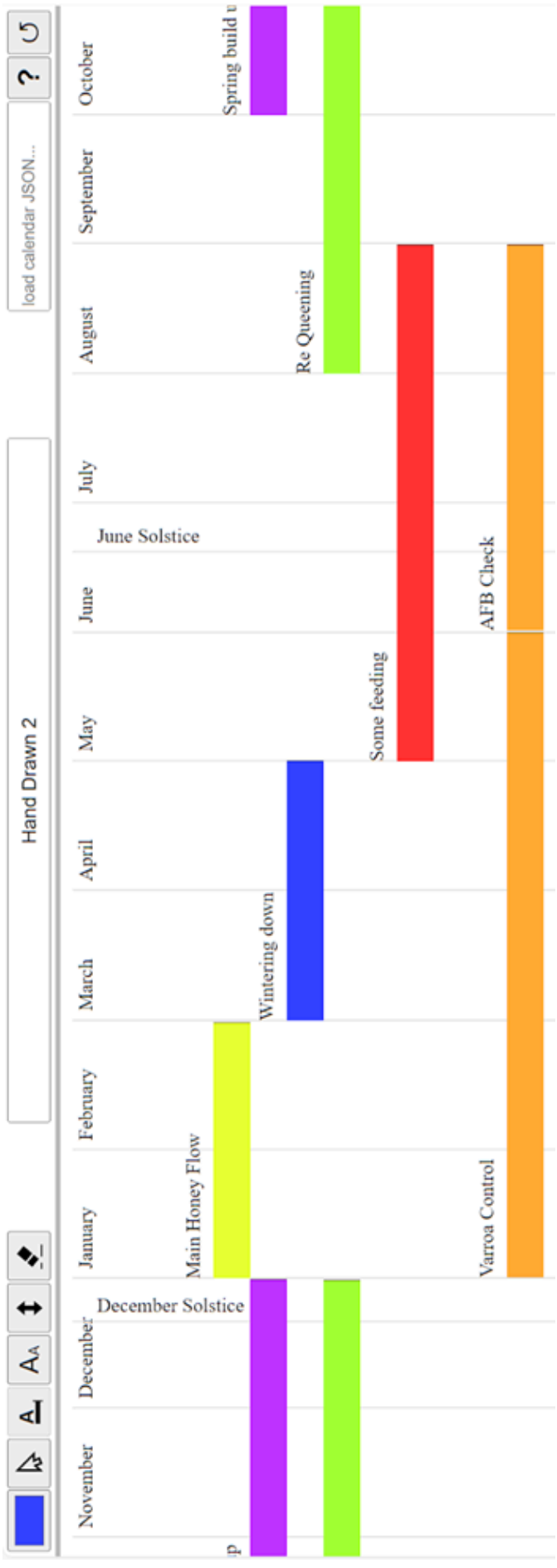
STEVE HEAL - RAUMATI BEACH, PARAPARAUMU.

USUALLY ONE OR TWO HIVES.
HIVES USUALLY ARE STRONG YEAR ROUND TREATED FOR VARROA ~~[illegible]~~ THROUGHOUT THE YEAR. OVER THE PAST FEW YEARS THE WINTERS HAVE BEEN ~~[illegible]~~ MILDER (WARMER) THEN IN PREVIOUS YEARS. THIS HAS RESULTED IN BROOD BEING IN THE HIVES ALL THROUGH THE YEAR. IN SPRING THE HIVES ARE SPLIT TO PREVENT SWARMING, THE BEE NUMBERS INCREASE RAPIDLY BY EARLY SUMMER (DECEMBER). THE HONEY FLOW STARTS IN EARLY TO MID DECEMBER THROUGH TO THE END OF JANUARY. MAIN VARROA SYNTHETIC TREATMENTS ARE INSTALLED IN THE HIVES AROUND MID FEBRUARY. THESE ARE AN 8 WEEK TREATMENT. WHEN THAT TREATMENT HAS ENDED, OXALIC ACID VAPOUR (SUBLIMATION) IS USED ~~[illegible]~~ EVERY 5 DAYS UNTILL THE END OF MAY WHEN APIVAR IS THEN PUT INTO THE HIVES AS A WINTER TREATMENT (10 WEEKS). IN EARLY SPRING STARTS UNTILL SUMMER BEFORE THE HONEY FLOW, OXALIC ACID SUBLIMATION IS USED — EVERY 5 DAYS. SOMETIMES DURING THE HONEY FLOW, FORMIC PRO IS USED AS A KNOCKDOWN IF VARROA LEVELS SUDDENLY SPIKE.
THE HIVE(S) CONSIST OF 2 MAIN FULL DEPTH BOXES FOR THE BROOD AND ~~[illegible]~~ 2 3/4 DEPTH BOXES ~~[illegible]~~ CONTAINING HONEY ARE LEFT ON THE HIVE ALL YEAR ROUND FOR HONEY SUPPLIES FOR THE BEES.

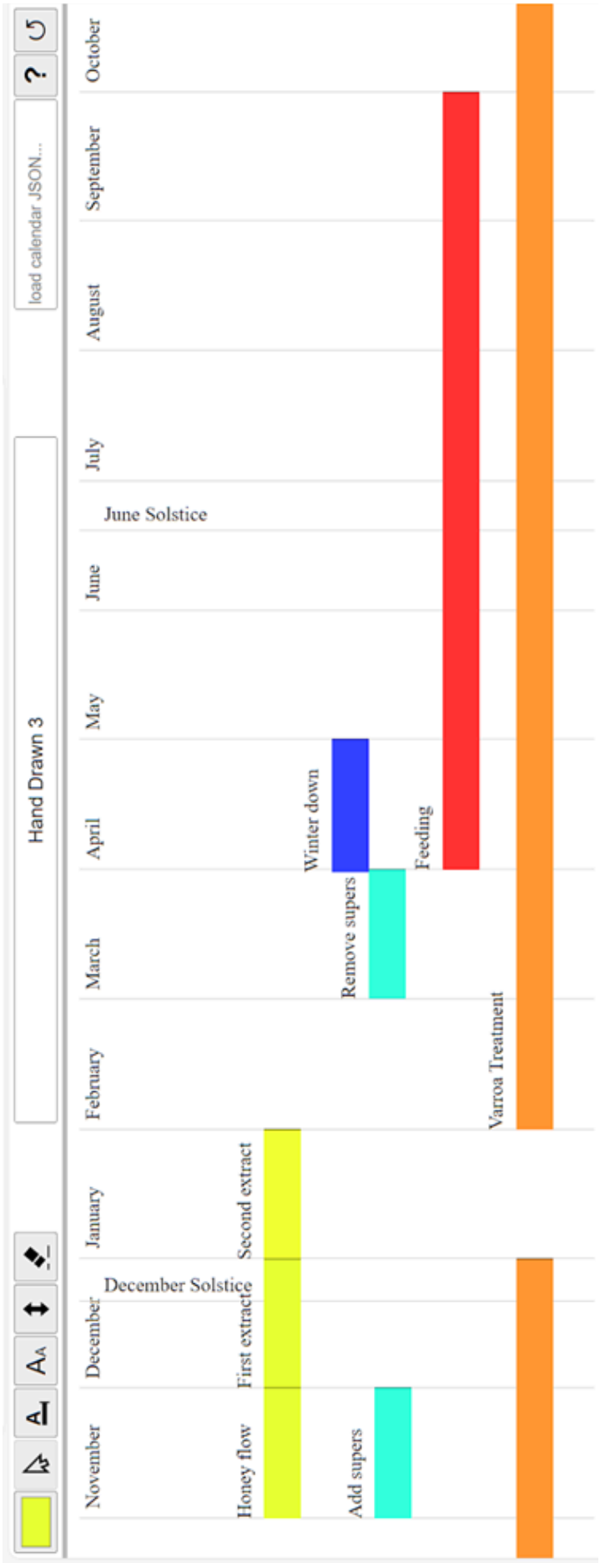

load calendar JSON...
Hand Drawn 1
November
December
January
February
March
April
May
June
July
August
September
October
December Solst
June Solstice
honey flow
monitor supers
monitor late swarms
wintering down
treatment for varroa mite
adding boxes, super
swarm control
making room for queen to lay
queen excluders
varroa treatment

2. Name and location unknown




load calendar JSON...
Hand Drawn 2
November
December
January
February
March
April
May
June
July
August
September
October
December Solstice
June Solstice
Main Honey Flow
Wintering down
Some feeding
Re Queening
AFB Check
Varroa Control
Spring build u

3. Jony Plimeter, New Zealand


load calendar JSON...
Hand Drawn 3
November
December
January
February
March
April
May
June
July
August
September
October
December Solstice
June Solstice
Honey flow
First extract
Second extract
Add supers
Remove supers
Winter down
Feeding
Varroa Treatment

June / July / August (Winter)

no/few brood treats

over Winter

so more varroa

- need to treat in Winter or very early in Spring

Spring

Sept / Oct / Nov

Earlier production of drone brood

- Earlier swarms (some in August)

usually swarming Nov → Dec

Mar / Apr / May

Autumn

?

Dec / Jan / Feb

Summer

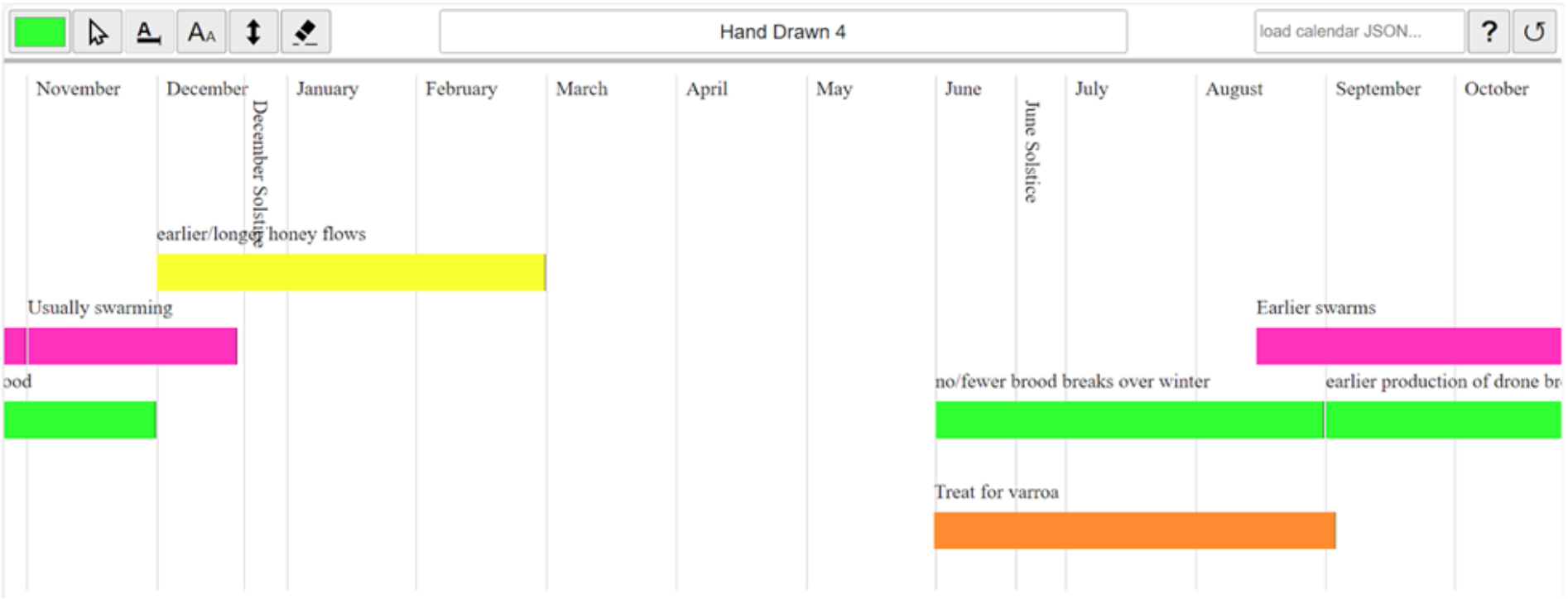
Earlier / longer honey flows

though no necessarily more honey

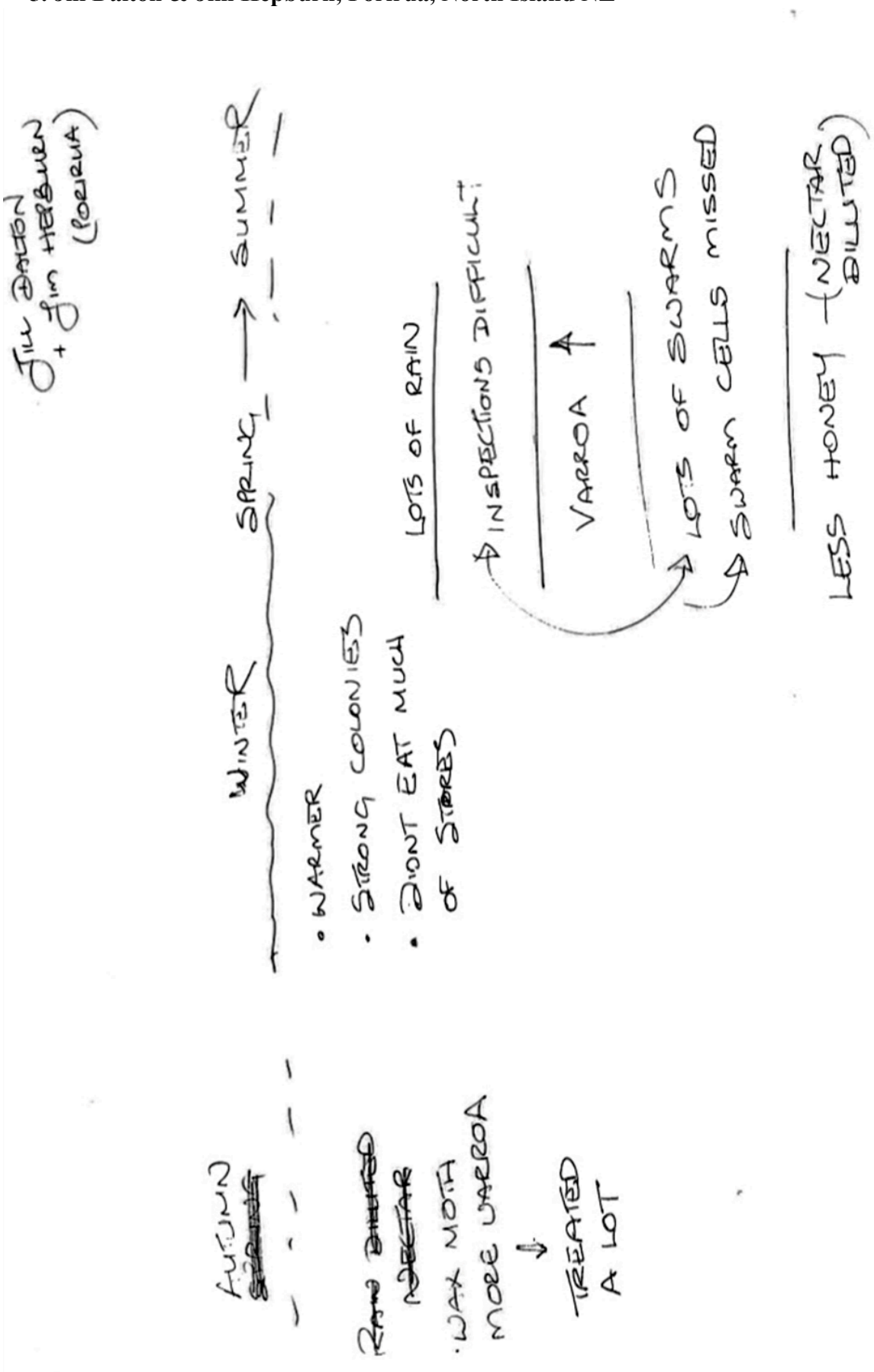
Lower Hutt

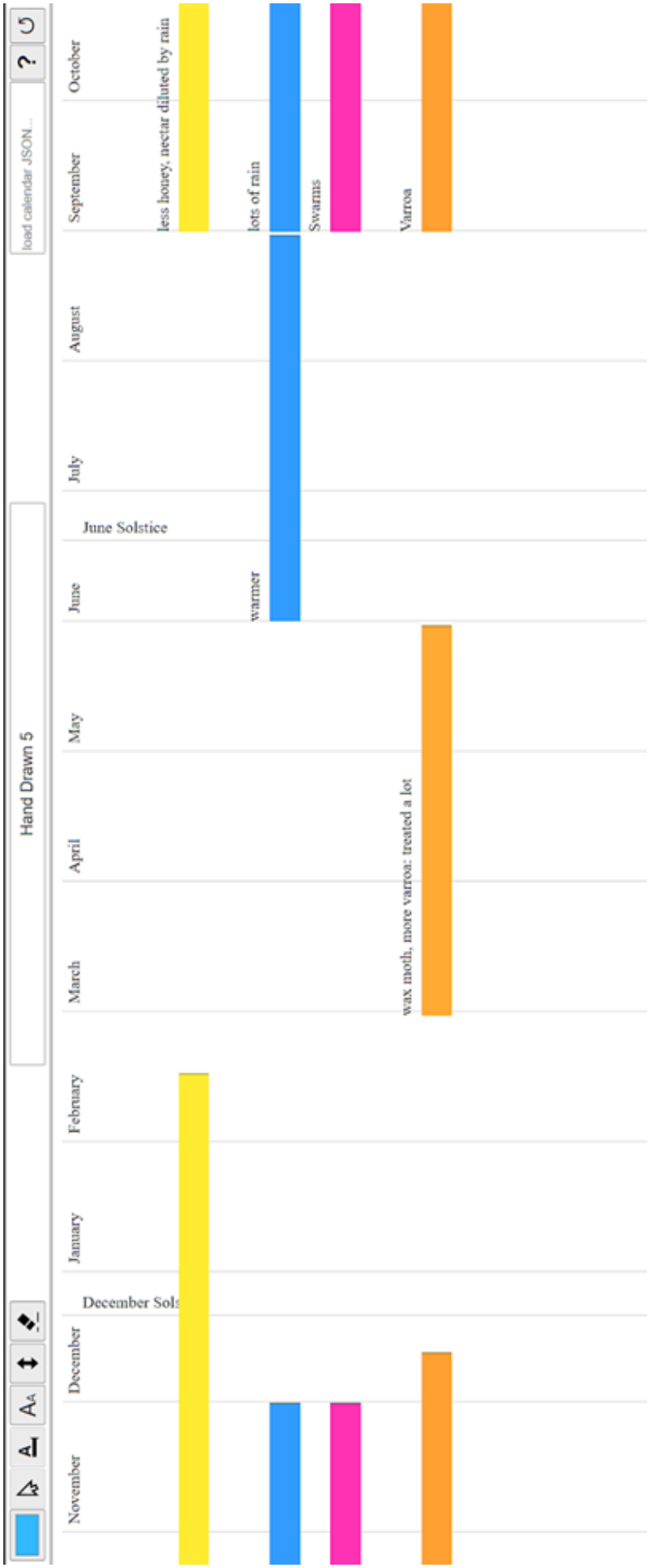
Richard

richardm braczek @ gmail.com

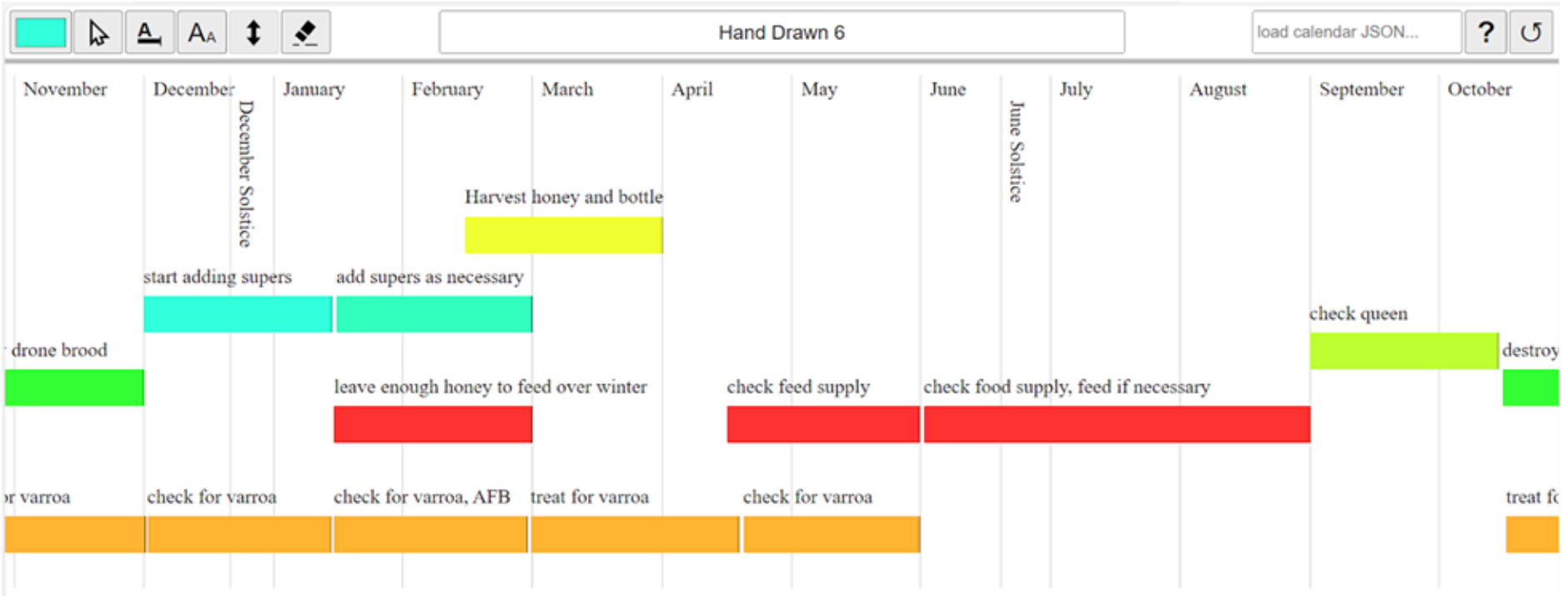

Hand Drawn 4
load calendar JSON...
November
December
January
February
March
April
May
June
July
August
September
October
December Solstice
June Solstice
earlier/longer honey flows
Usually swarming
Earlier swarms
ood
no/fewer brood breaks over winter
earlier production of drone br
Treat for varroa

5. Jill Dalton & Jim Hepburn, Porirua, North Island NZ




load calendar JSON...
Hand Drawn 5
November
December
January
February
March
April
May
June
July
August
September
October
December Sols
June Solstice
less honey, nectar diluted by rain
lots of rain
warmer
Swarms
wax moth, more varroa: treated a lot
Varroa

6. Dave Henderson, North Island NZ


Hand Drawn 6
load calendar JSON...
November
December
January
February
March
April
May
June
July
August
September
October
December Solstice
June Solstice
Harvest honey and bottle
start adding supers
add supers as necessary
check queen
drone brood
destroy
leave enough honey to feed over winter
check feed supply
check food supply, feed if necessary
r varroa
check for varroa
check for varroa, AFB
treat for varroa
check for varroa
treat fo

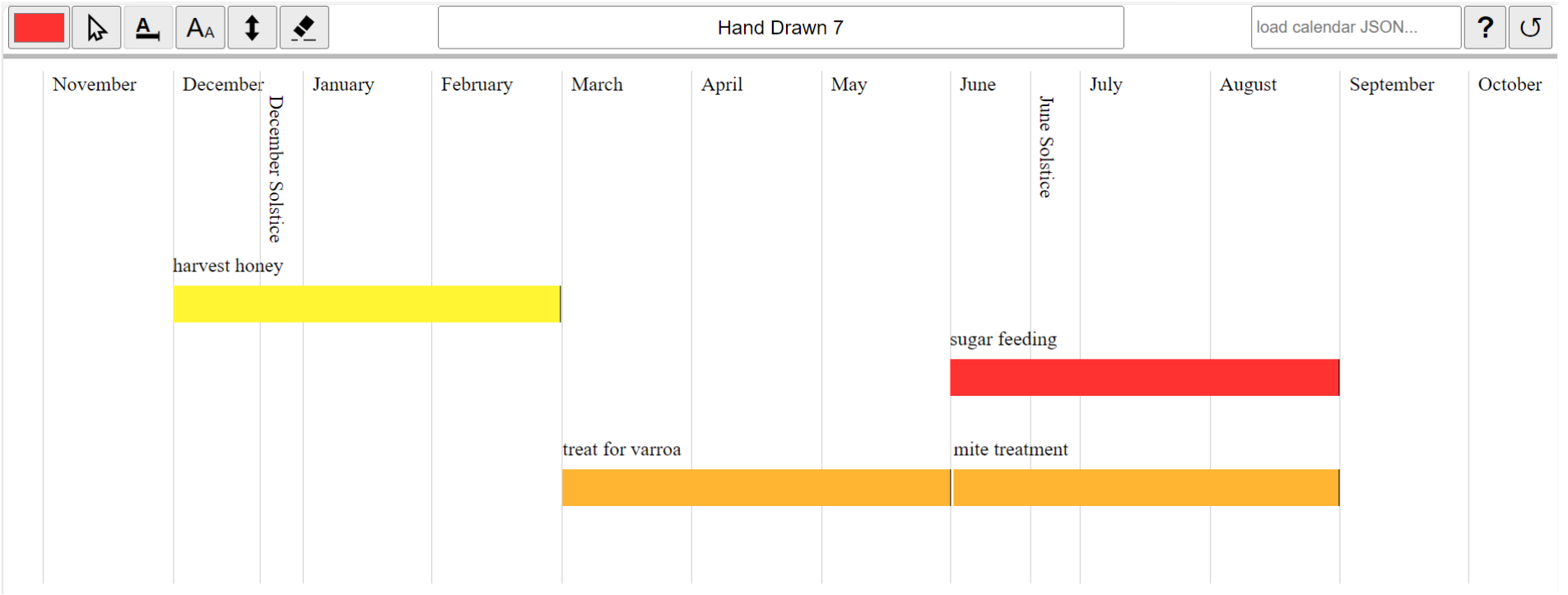
7. Name and location unknown

Winter- sugar feeding and mite treatment

Spring - plant flowers, take out mites.

Summer- Harvest honey

Fall- Treat for Varoa;


Hand Drawn 7
load calendar JSON...
November
December
January
February
March
April
May
June
July
August
September
October
December Solstice
June Solstice
harvest honey
sugar feeding
treat for varroa
mite treatment

Spring

- ~~Usually~~ last year very wet.
- bees not getting out
- hard to do inspections get treatment in

this Spring couple of frosts
lots of hives swarming later

Drier Spring -

Treat varroa with oxalic acid strips / Bayoral
Oxalic acid vaporizing

Summer

Good amts honey last year

- late to fill boxes this summer

haven't extracted yet.

some hives - very strong a couple weak

- hives swarmed early / before Nov / Q not laying well
- not well mated?

Autumn

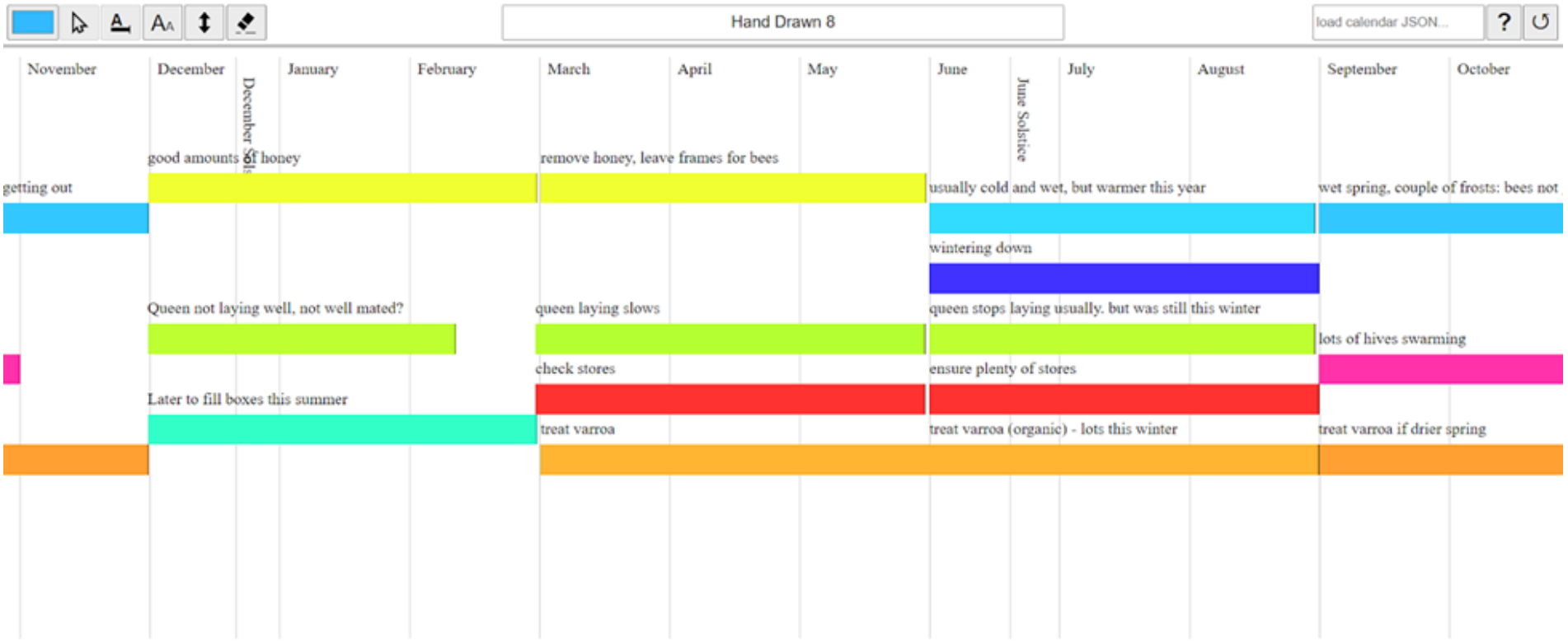
- wrap hives polystyrene
- check stores
- Q slows laying
- remove honey leave 10 frames for bees
- treat varroa.
- apivar or Apitraz followed by api Life var organic treatment over winter

Winter

- usually cold/wet Queen ~~may~~ usually stop laying / at least slows down (winter down / plenty stores)

- this winter warmer
Queen laying
Bees active
lots + lots of varroa in hives
Started oxalic acid vaporizing

Upper Hutt
Michele
michele.vandaalen@gmail.com


Hand Drawn 8
load calendar JSON...
November
December
January
February
March
April
May
June
July
August
September
October
December Sol
June Solstice
good amounts of honey
remove honey, leave frames for bees
getting out
usually cold and wet, but warmer this year
wet spring, couple of frosts: bees not
wintering down
Queen not laying well, not well mated?
queen laying slows
queen stops laying usually. but was still this winter
lots of hives swarming
check stores
ensure plenty of stores
Later to fill boxes this summer
treat varroa
treat varroa (organic) - lots this winter
treat varroa if drier spring

9. Janine Davie, Porirua, North Island NZ

Janine Davie - Porirua

February - treatment for varroa mite
March " " "

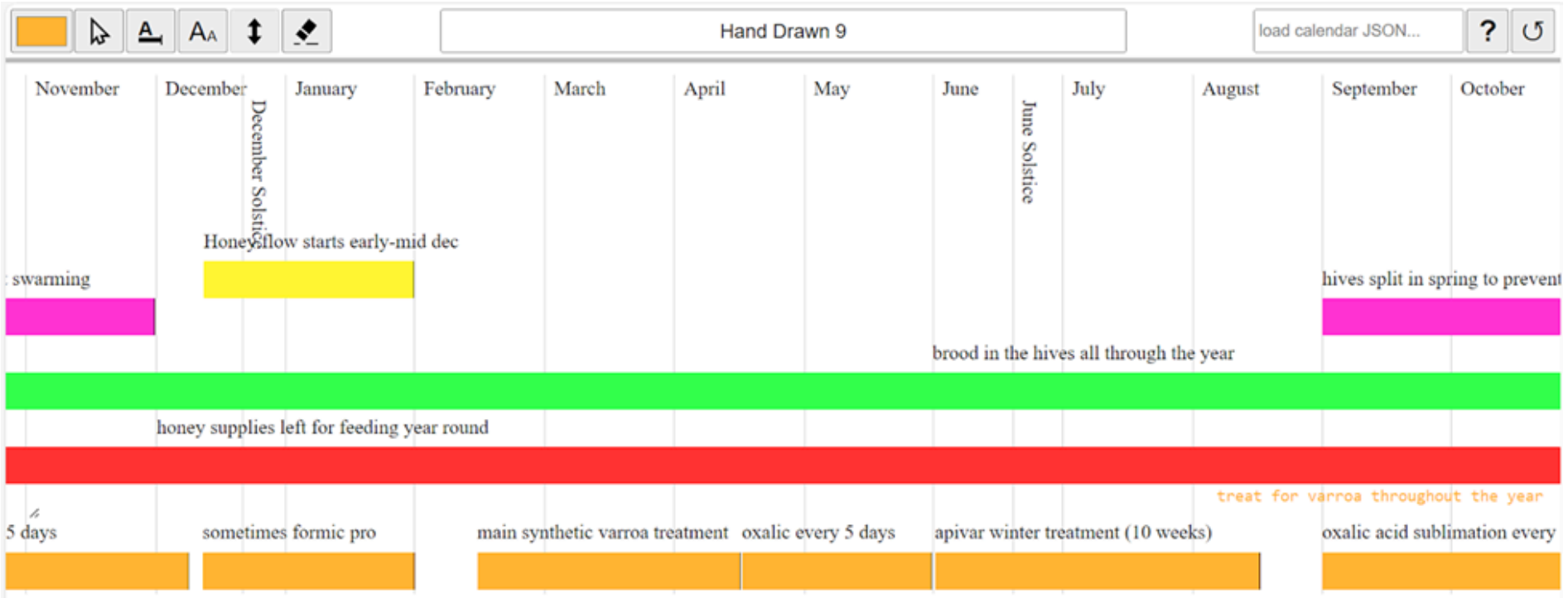
April Winding down.

May - July fairly quiet

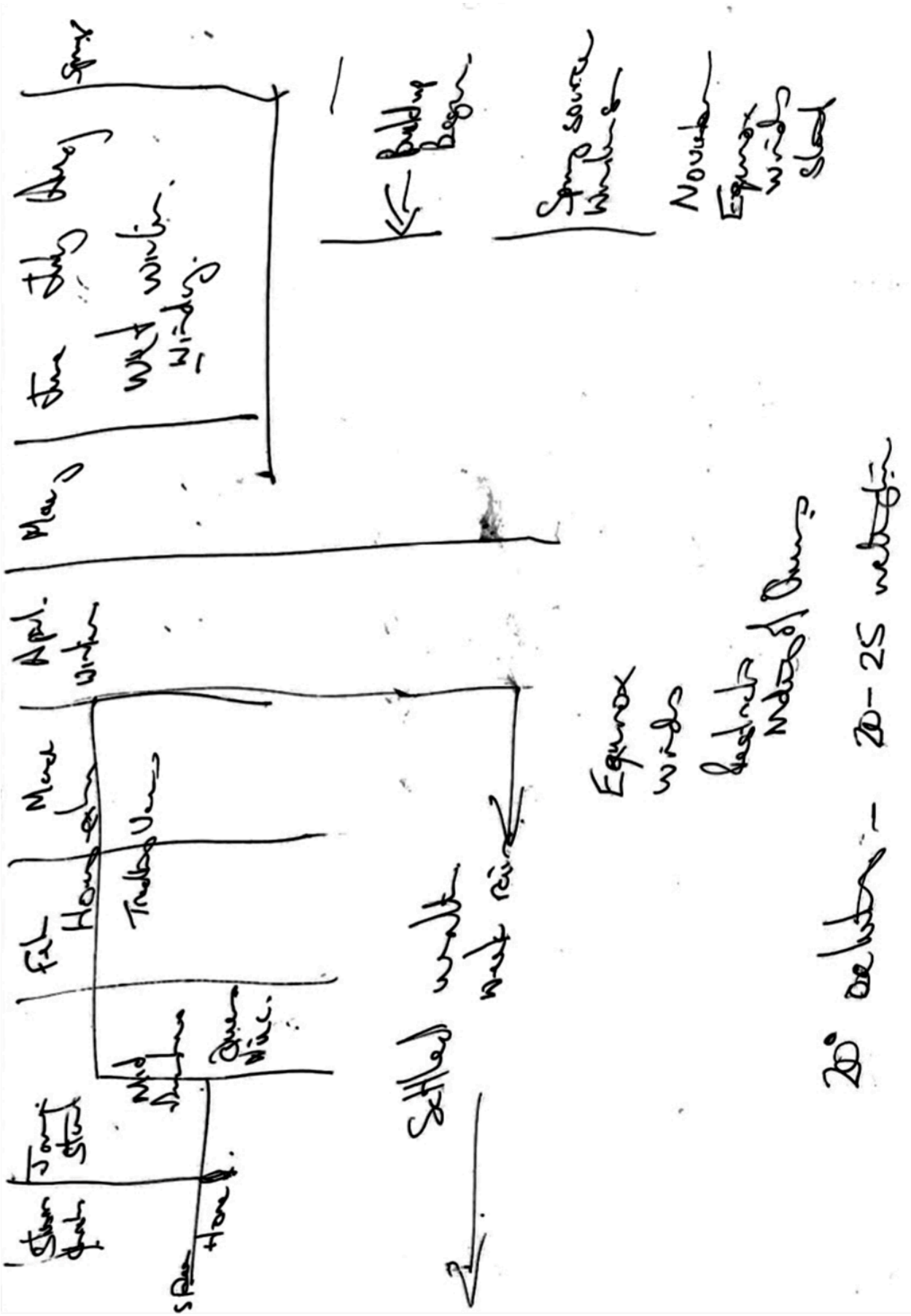
August - starting to ramp up
- varroa treatment.
- making sure there is room in the hive for queen to lay

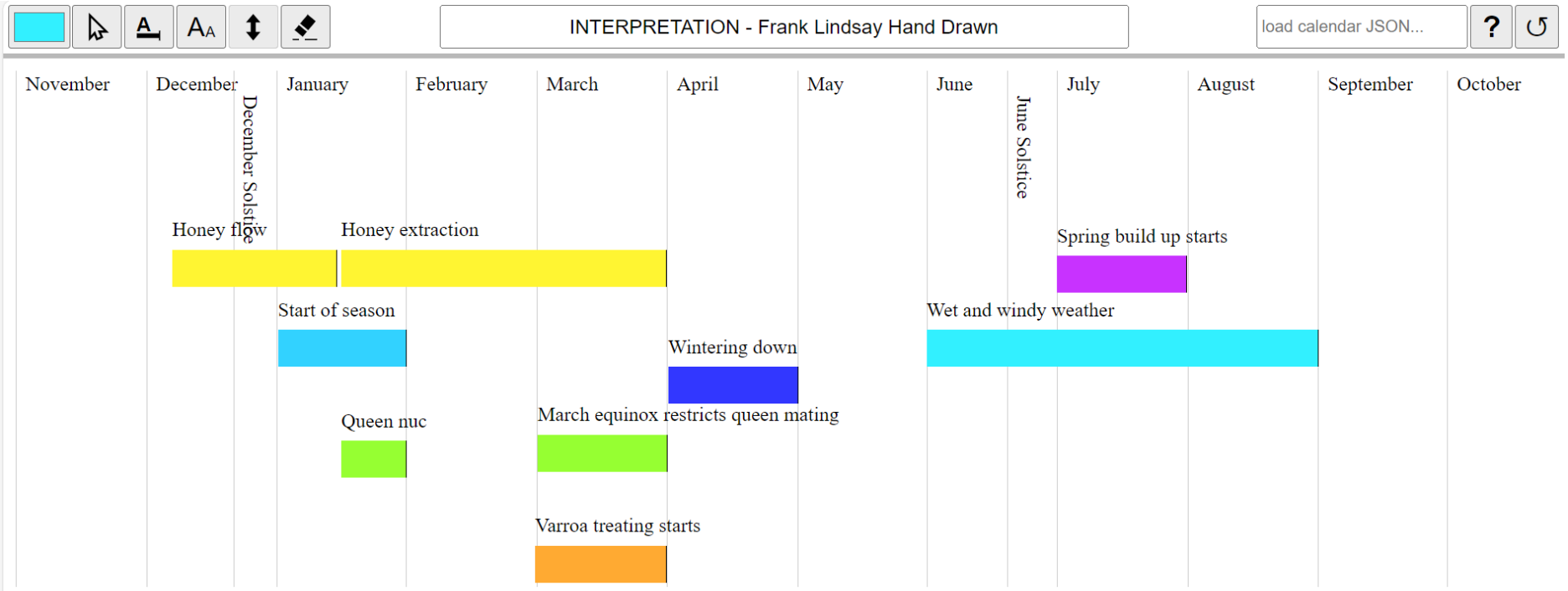
September - Adding boxes, supers, queen excluders
October swarm control

November - January
honey flow, keeping an eye on supers, any late swarms.


Hand Drawn 9
load calendar JSON...
November
December
January
February
March
April
May
June
July
August
September
October
December Solstice
June Solstice
Honeyflow starts early-mid dec
swarming
hives split in spring to prevent
brood in the hives all through the year
honey supplies left for feeding year round
treat for varroa throughout the year
5 days
sometimes formic pro
main synthetic varroa treatment
oxalic every 5 days
apivar winter treatment (10 weeks)
oxalic acid sublimation every

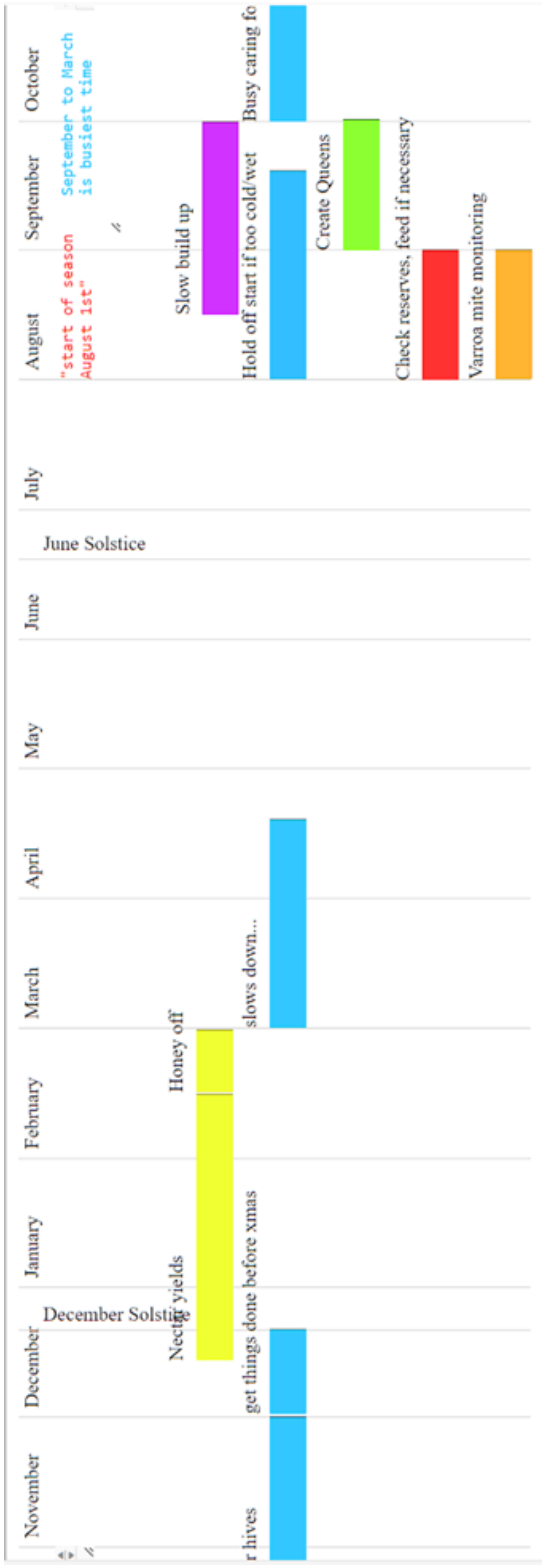
10. Frank Lindsay, Wellington, North Island NZ




INTERPRETATION - Frank Lindsay Hand Drawn
load calendar JSON...
November
December
January
February
March
April
May
June
July
August
September
October
December Solstice
June Solstice
Honey flow
Honey extraction
Spring build up starts
Start of season
Wet and windy weather
Wintering down
Queen nuc
March equinox restricts queen mating
Varroa treating starts

Interpretations from Verbalized Beekeeping Calendars During Interviews

Online Interpretation of Rae Butler's Verbalized Calendar:



Online Interpretation of Bill McDonald's Verbalized Calendar: