Like many dairy farmers, I try to maximize the time and money I spend on my farm. To that end, I have planted some unconventional combination of crops over the years. In 2014, I grew two crops that do well in the short, cold season of northern maine—brassicas and small grains.

 My project tested kale and forage turnips. The idea was to intersow brassica into the small grain—the grain would be harvested at the ordinary time; the grain residue and the brassicas would be harvested later in the season and fed to the cows. Four acres were used to test the two brassica crops in oats; four acres were used to test the brassicas in spring wheat. The goal was to produce both a grain crop and a high quality forage with a minimum of expense and tillage.

Plot 1-- oats sown in May with kale sown at the same time.

Plot 2-- oats sown in May-- kale sown into the oats after ten days.

Plot 3-- oats sown in May with forage turnips sown at the same time.

Plot 4-- oats sown in May-- forage turnips sown into the oats after ten days.

Plot 5-- spring wheat sown in May with kale sown at the same time.

Plot 6—spring wheat sown in May-- kale sown into the spring wheat after ten days.

Plot 7-- spring wheat sown in May with forage turnips sown at the same time.

Plot 8-- spring wheat sown in May-- forage turnips sown into the spring wheat after ten days.

 The oats and wheat were harvested as grain at the appropriate harvest times-- September. The grain was cut relatively high in order to leave a substantial amount of straw/crop residue in the field with the brassicas and in order to not damage the growing brassicas.

 The stands of brassicas were measured for plants per square foot before the grain harvest and one week after the grain harvest. Approximately 30-45 days after grain harvest, the brassicas were harvested as livestock feed( see below).

 The brassica/grain residue were harvested with a flail chopper and fed to our dairy herd. No problems arose with off-flavored milk. Tons per acre were recorded. A standard feed analysis was conducted for each plot through Dairy One in New York.

Yield per acre --tons per acre.

Grain

Plot 1- 1200 lbs oats

Plot 2-- 900 lbs oats

Plot 3-- 1300 lbs oats

Plot 4-- 1200 lbs. oats

Plot 5-- 700 lbs. wheat

Plot 6-- 800 lbs wheat

Plot 7-- 950 lbs wheat

Plot 8-- 900 lbs wheat

Brassicas plus straw-- ton per acre

Plot 1—NA

Plot 2—NA

Plot 3— 900 lbs.

Plot 4—800 lbs.

Plot 5—NA

Plot 6— NA

Plot 7—800 lbs.

Plot 8—700 lbs.

 The kale in all four plots where it was sown failed to produce a harvestable crop. Although it sprouted well and initially appeared to be growing well, it did not compete well with the weeds in the feed—nor did it grow well as a companion crop with either wheat or oats. At harvest time, most of the kale had been smothered out. At harvest time for brassicas, the kale that was there was too small to harvest.

 Forage test results showed that the straw/brassica grrenchop was of moderate value as feed. Available protein ranged from roughly 6 % to 11%, with no significant difference int the plots harvested.

 The forage turnips did better than the kale—though they did not do as well as hoped. Yields were lower than originally anticipated. In addition, our location received a foot of heavy wet snow just before the planned harvest time for the brassicas. Although the snow did melt after almost two weeks, the forage turnips had been flattened to the ground, making harvest with any machinery very difficult. These conditions made the already low yield even lower. Quality of forage also suffered. Moose damage on the forage turnips in October was also significant.

 Weed pressure in each plot was recorded on a scale of 1-10 and as a sample of weeds per square meter. This was measured and recorded just prior to grain harvest and just prior to harvesting the brassica crop.

Weed pressure before grain harvest:

Plot 1—8

Plot 2—8

Plot 3—4

Plot 4—5

Plot 5—9

Plot 6—8

Plot 7—3

Plot 8—4

Weed pressure before brassica harvest:

Plot 1—10

Plot 2—10

Plot 3—4

Plot 4—5

Plot 5—10

Plot 6—10

Plot 7—3

Plot 8—4

Weed pressure was excessive in all the plots sown to kale. In general weed pressure affected yields of brassica more than it affected yields of grain.

 Density of brassicas in each plot—plants per square meter. This was measured and recorded just prior to grain harvest and just prior to harvesting the brassica crop.

Density of brassicas—just prior to grain harvest-- plants/square meter

Plot 1—4

Plot 2—6

Plot 3—36

Plot 4—48

 Plot 5—2

Plot 6—5

Plot 7—60

Plot 8—52

Density of brassicas—just prior to brassica harvest-- plants/square meter

Plot 1—0

Plot 2—0

Plot 3—30

Plot 4—44

 Plot 5—2

Plot 6—4

Plot 7—54

Plot 8—40

 Plots 3 and 7—where the forage turnips were sown at the same time as the grains—performed somewhat better than the plots where the brassicas were sown after a ten day delay. This project provides some evidence that sowing brassicas and grains at the same time would be the better practice in general.

 The primary result of this project was to determine that forage turnips perform far better in our conditions than kale when sown with spring wheat or oats. Although conditions also determined that the forage turnips did not perform particularly well as a green chop crop in the small grain residue (as planned), there are potentials for using forage turnips sown into small grains, given the results of this project. For example, we estimated that 200 lbs of baby turnip greens could be harvested per acre in the plots sown with forage turnips with either wheat or oats. These greens could be sold as a cash crop(Even at $2/ pound, this would add considerably to the financial viability of the grain/brassica crop.) In addition, there is evidence that the presence of the forage turnips in the grain field may help prepare the ground for a subsequent crop, much in the same way tillage radishes perform. Although this project was not designed to test the function of the forage turnips in preparing the soil for next year’s crops, the root systems and organic matter contributed by the turnips must have a positive impact on preparing the ground for next planting season. Thirdly, even in adverse climactic conditions such as those experienced in New Sweden in 2014 (early snow, moose), the forage turnips could be effectively grazed instead of being chopped with a green chopper. Because of the location of the fields in this project, grazing was not practical for our farm.

 In our conditions, our plan of green chopping grain residue and brassicas did not end up being a viable, profitable option. However, the project did raise the possibility of intersowing brassicas into grain for the purpose of harvesting the brassicas as human food; it also raised the possibility of using the brassicas as a crop to prepare ground for future crops.

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