

Supplementary table 1. Producer accuracies (PA), user accuracies (UA) and overall accuracies (OA) of the classified raster outputs for Begtrup Vig (Tang.Nu.), Knebel Vig and Isefjorden (Vildtang).

| Location           | Date                    | Class        | PA  | UA | OA                                   |
|--------------------|-------------------------|--------------|-----|----|--------------------------------------|
| <b>Begtrup Vig</b> | 01.11.2018 + 09.04.2019 | <i>Fucus</i> | 65  | 85 | <b>(<math>\bar{x}</math>) = 0.77</b> |
|                    |                         | Substrate    | 79  | 61 |                                      |
| <b>Knebel Vig</b>  | 14.08.2020              | <i>Fucus</i> | 96  | 21 | <b>0.88</b>                          |
|                    |                         | Substrate    | 4   | 79 |                                      |
|                    | 13.11.2020              | <i>Fucus</i> | 92  | 30 | <b>0.81</b>                          |
|                    |                         | Substrate    | 8   | 70 |                                      |
|                    | 22.03.2021              | <i>Fucus</i> | 90  | 19 | <b>0.86</b>                          |
|                    |                         | Substrate    | 10  | 81 |                                      |
|                    | 10.05.2021              | <i>Fucus</i> | 75  | 17 | <b>0.79</b>                          |
|                    |                         | Substrate    | 25  | 83 |                                      |
|                    | 28.09.2021              | <i>Fucus</i> | 98  | 27 | <b>0.855</b>                         |
|                    |                         | Substrate    | 2   | 73 |                                      |
|                    | <b>Overall accuracy</b> |              |     |    | <b>(<math>\bar{x}</math>) = 0.83</b> |
| <b>Isefjorden</b>  | 16.03.2021 (before)     | <i>Fucus</i> | 94  | 8  | <b>0.93</b>                          |
|                    |                         | Substrate    | 6   | 92 |                                      |
|                    | 16.03.2021 (after)      | <i>Fucus</i> | 100 | 11 | <b>0.95</b>                          |
|                    |                         | Substrate    | 0   | 89 |                                      |
|                    | 12.05.2021              | <i>Fucus</i> | 71  | 4  | <b>0.84</b>                          |
|                    |                         | Substrate    | 29  | 96 |                                      |
|                    | 14.09.2021              | <i>Fucus</i> | 96  | 19 | <b>0.89</b>                          |
|                    |                         | Substrate    | 4   | 81 |                                      |
|                    | 16.11.2021              | <i>Fucus</i> | 87  | 8  | <b>0.90</b>                          |
|                    |                         | Substrate    | 13  | 92 |                                      |
|                    | 05.05.2022 (before)     | <i>Fucus</i> | 82  | 10 | <b>0.86</b>                          |
|                    |                         | Substrate    | 18  | 90 |                                      |
|                    | 05.05.2022 (after)      | <i>Fucus</i> | 79  | 8  | <b>0.86</b>                          |
|                    |                         | Substrate    | 21  | 92 |                                      |
|                    | <b>Overall accuracy</b> |              |     |    | <b>(<math>\bar{x}</math>) = 0.89</b> |

Supplementary table 2.a. Biomass harvest yields all locations. Fixed effect: Treatment (control, tips, thinning, full). Text in bold indicates significant differences in the relevant parameter between the different fixed effects. For significant test results, the accompanying pair wise comparisons (PWC) are shown with bold text indicating significant differences between pair wise comparisons.

| Test type and results            |                 |           |                  |                      |
|----------------------------------|-----------------|-----------|------------------|----------------------|
| Kruskall-Wallis                  | H (3) = 59.2807 |           |                  | <b>P &lt; 0.0001</b> |
| Dunn's PWC (Bonferroni adjusted) | <b>T1</b>       | <b>T2</b> | <b>Statistic</b> | <b>P</b>             |
|                                  | control         | full      | 7.5580122        | <b>&lt; 0.0001</b>   |
|                                  | control         | thinning  | 3.7173455        | <b>0.001</b>         |
|                                  | control         | tips      | 3.5896297        | <b>0.002</b>         |
|                                  | full            | thinning  | -3.7192633       | <b>0.001</b>         |
|                                  | full            | tips      | -3.8693943       | <b>&lt; 0.001</b>    |
|                                  | thinning        | tips      | -0.1350197       | 1.000                |

Supplementary table 2.b. Isefjorden. Biomass harvest yields. Fixed effects: Harvest type: second (2<sup>nd</sup> full harvest of all plots) and origin by original plot treatment type (control, tips, thinning and full (1<sup>st</sup> full harvest). T1 and T2 indicates the two treatments compared. Text in bold indicates significant differences in the relevant parameter between the different fixed effects. For significant test results the accompanying pair wise comparisons (PWC) are shown with bold text indicating significant differences between pair wise comparisons.

| Test type and results |                  |           |                 |                  |
|-----------------------|------------------|-----------|-----------------|------------------|
| ANOVA                 | F (4,12) = 6.111 |           |                 | P = <b>0.006</b> |
| Tukey's PWC           | <b>T1</b>        | <b>T2</b> | <b>Estimate</b> | <b>P</b>         |
|                       | second           | control   | 0.074           | 1.000            |
|                       | second           | full      | -1.170          | 0.244            |
|                       | second           | full      | -2.285          | <b>0.003</b>     |
|                       | second           | thinning  | 0.674           | 0.973            |
|                       | second           | tips      | -0.242          | 0.997            |
|                       | control          | full      | -1.244          | 0.342            |
|                       | control          | full      | -2.359          | <b>0.009</b>     |
|                       | control          | thinning  | 0.600           | 0.987            |
|                       | control          | tips      | -0.316          | 0.995            |
|                       | full             | full      | -1.115          | 0.457            |
|                       | full             | thinning  | 1.844           | 0.409            |
|                       | full             | tips      | 0.928           | 0.643            |
|                       | full             | thinning  | 2.959           | 0.054            |
|                       | full             | tips      | 2.043           | <b>0.030</b>     |
|                       | thinning         | tips      | -0.916          | 0.924            |

Supplementary table 2.c. Begtrup. UAV-based areal cover (%) (data log transformed). T1 and T2 indicates the two treatments compared. Text in bold indicates significant differences in the relevant parameter between the different fixed effects. For significant test results the accompanying pair wise comparisons (PWC) are shown with bold text indicating significant differences between pair wise comparisons.

| <b>Fixed effect</b>                          | <b>Test type and results</b> |                  |               |                  |
|----------------------------------------------|------------------------------|------------------|---------------|------------------|
| Treatment<br>(control, tips, thinning, full) | ANOVA                        | F (2,36) = 3.455 |               | <b>P = 0.042</b> |
|                                              | Tukey's PWC                  | <b>T1</b>        | <b>T2</b>     | <b>Estimate</b>  |
|                                              |                              | full             | thinning      | -0.291           |
|                                              |                              | full             | tips          | -1.007           |
|                                              |                              | thinning         | tips          | -0.716           |
| Time                                         | ANOVA                        | F (1,36) = 7.763 |               | <b>P = 0.008</b> |
|                                              | Tukey's PWC                  | <b>T1</b>        | <b>T2</b>     | <b>Estimate</b>  |
|                                              |                              | Before harvest   | After harvest | -0.897           |
| Treatment x Time                             | ANOVA                        | F (2,36) = 2.798 |               | P = 0.074        |

Supplementary table 2.d. Knebel 2019. UAV-based areal cover (%). T1 and T2 indicates the two treatments compared. Text in bold indicates significant differences in the relevant parameter between the different fixed effects. For significant test results the accompanying pair wise comparisons (PWC) are shown with bold text indicating significant differences between pair wise comparisons.

| Fixed effect                                          | Test type and results |                  |               |                  |
|-------------------------------------------------------|-----------------------|------------------|---------------|------------------|
| Treatment<br>(control,<br>tips,<br>thinning,<br>full) | ANOVA                 | F (3,40) = 5.528 |               | <b>P = 0.024</b> |
|                                                       | Tukey's<br>PWC        | <b>T1</b>        | <b>T2</b>     | <b>Estimate</b>  |
|                                                       |                       | control          | full          | -15.909          |
|                                                       |                       | control          | thinning      | 16.650           |
|                                                       |                       | control          | tips          | 17.440           |
|                                                       |                       | full             | thinning      | 32.558           |
|                                                       |                       | full             | tips          | 33.349           |
|                                                       |                       | thinning         | tips          | 0.790            |
| Time                                                  | ANOVA                 | F (1,40) = 3.741 |               | <b>P = 0.018</b> |
|                                                       | Tukey's<br>PWC        | <b>T1</b>        | <b>T2</b>     | <b>Estimate</b>  |
|                                                       |                       | Before harvest   | After harvest | -19.244          |
| Treatment<br>x Time                                   | ANOVA                 | F (3,40) = 2.323 |               | P = 0.09         |

Supplementary table 2.e. Knebel 2020-22. Development in UAV-based areal cover (%). T1 and T2 indicates the two treatments compared. Text in bold indicates significant differences in the relevant parameter between the different fixed effects. For significant test results the accompanying pair wise comparisons (PWC) are shown with bold text indicating significant differences between pair wise comparisons.

| Fixed effects                                         | Test type and results |                          |            |                      |
|-------------------------------------------------------|-----------------------|--------------------------|------------|----------------------|
| Treatment<br>(control,<br>tips,<br>thinning,<br>full) | LME ANOVA             | F (3,69) = 4.63352       |            | <b>P = 0.0052</b>    |
|                                                       | Tukey's PWC           | <b>T1</b>                | <b>T2</b>  | <b>Estimate</b>      |
|                                                       |                       | control                  | full       | -0.365               |
|                                                       |                       | control                  | thinning   | -4.661               |
|                                                       |                       | control                  | tips       | 6.302                |
|                                                       |                       | full                     | thinning   | -4.297               |
|                                                       |                       | full                     | tips       | 6.667                |
|                                                       |                       | thinning                 | tips       | 10.964               |
| Time                                                  | LME ANOVA             | F (5,69) = 23.43285      |            | <b>P &lt; 0.0001</b> |
|                                                       | Tukey's PWC           | <b>T1</b>                | <b>T2</b>  | <b>Estimate</b>      |
|                                                       |                       | Before harvest 14.5.2020 | 14.8.2020  | -2.38                |
|                                                       |                       | Before harvest 14.5.2020 | 13.11.2020 | -25.35               |
|                                                       |                       | Before harvest 14.5.2020 | 22.3.2021  | -24.02               |
|                                                       |                       | Before harvest 14.5.2020 | 10.5.2021  | -16.99               |
|                                                       |                       | Before harvest 14.5.2020 | 28.9.2021  | -29.41               |
|                                                       |                       | 14.8.2020                | 13.11.2020 | -22.97               |

|                     |                |                                                                         |           |           |                   |              |
|---------------------|----------------|-------------------------------------------------------------------------|-----------|-----------|-------------------|--------------|
|                     |                | 14.8.2020                                                               | 22.3.2021 | -21.64    | <b>&lt;0.0001</b> |              |
|                     |                | 14.8.2020                                                               | 10.5.2021 | -14.61    | <b>0.002</b>      |              |
|                     |                | 14.8.2020                                                               | 28.9.2021 | -27.03    | <b>&lt;0.0001</b> |              |
|                     |                | 13.11.2020                                                              | 22.3.2021 | 1.33      | 0.999             |              |
|                     |                | 13.11.2020                                                              | 10.5.2021 | 8.36      | 0.208             |              |
|                     |                | 13.11.2020                                                              | 28.9.2021 | -4.06     | 0.872             |              |
|                     |                | 22.3.2021                                                               | 10.5.2021 | 7.03      | 0.390             |              |
|                     |                | 22.3.2021                                                               | 28.9.2021 | -5.39     | 0.676             |              |
|                     |                | 10.5.2021                                                               | 28.9.2021 | -12.42    | 0.013             |              |
|                     |                |                                                                         |           |           |                   |              |
| Treatment x<br>Time | LME<br>ANOVA   | F (15,69) = 1.140                                                       |           |           | P = 0.339         |              |
|                     | Tukey's<br>PWC | <b>Time</b>                                                             | <b>T1</b> | <b>T2</b> | <b>Estimate</b>   | <b>P</b>     |
|                     |                | Before<br>harvest<br>14.5.20                                            | control   | full      | -15.312           | 0.161        |
|                     |                |                                                                         | control   | thinning  | -12.031           | 0.355        |
|                     |                |                                                                         | control   | tips      | 2.188             | 0.990        |
|                     |                |                                                                         | full      | third     | 3.281             | 0.969        |
|                     |                |                                                                         | full      | tips      | 17.500            | 0.085        |
|                     |                |                                                                         | thinning  | tips      | 14.219            | 0.215        |
|                     |                | 14.8.20                                                                 | control   | full      | 21.875            | <b>0.019</b> |
|                     |                |                                                                         | control   | thinning  | 2.812             | 0.980        |
|                     |                |                                                                         | control   | tips      | 14.375            | 0.206        |
|                     |                |                                                                         | full      | third     | -19.062           | <b>0.051</b> |
|                     |                |                                                                         | full      | tips      | -7.500            | 0.731        |
|                     |                |                                                                         | thinning  | tips      | 11.562            | 0.390        |
|                     |                | 13.11.2020                                                              | control   | full      | 35.469            | 0.999        |
|                     |                |                                                                         | control   | thinning  | 10.281            | 0.756        |
|                     |                |                                                                         | control   | tips      | 6.625             | 1.000        |
|                     |                |                                                                         | full      | third     | -25.188           | 0.825        |
|                     |                |                                                                         | full      | tips      | -28.844           | 0.998        |
|                     |                |                                                                         | thinning  | tips      | -3.656            | 0.731        |
|                     |                | 22.03 + 10.05 + 28.9.2021 No significant differences between treatments |           |           |                   |              |

Supplementary table 2.f. Isefjorden 2021-22. Development in UAV-based areal cover (%). T1 and T2 indicates the two treatments compared. Text in bold indicates significant differences in the relevant parameter between the different fixed effects. For significant test results the accompanying pair wise comparisons (PWC) are shown with bold text indicating significant differences between pair wise comparisons.

| Fixed effects                                         | Test type and results |                    |               |                      |
|-------------------------------------------------------|-----------------------|--------------------|---------------|----------------------|
| Treatment<br>(control,<br>tips,<br>thinning,<br>full) | LME ANOVA             | F (3,69) = 19.9050 |               | <b>P &lt; 0.0001</b> |
|                                                       | Tukey's PWC           | <b>T1</b>          | <b>T2</b>     | <b>Estimate</b>      |
|                                                       |                       | control            | full          | 16.552               |
|                                                       |                       | control            | thinning      | 4.016                |
|                                                       |                       | control            | tips          | 3.510                |
|                                                       |                       | full               | thinning      | -12.536              |
|                                                       |                       | full               | tips          | -13.042              |
|                                                       |                       | thinning           | tips          | -0.505               |
| Time                                                  | LME ANOVA             | F (5,69) = 40.4313 |               | <b>P &lt; 0.0001</b> |
|                                                       | Tukey's PWC           | <b>T1</b>          | <b>T2</b>     | <b>Estimate</b>      |
|                                                       |                       | Before harvest     | After harvest | 18.58                |
|                                                       |                       | 16.3.21            | 16.3.21       |                      |
|                                                       |                       | Before harvest     | 12.5.21       | 16.56                |
|                                                       |                       | 16.3.21            |               |                      |
|                                                       |                       | Before harvest     | 14.9.21       | -1.04                |
|                                                       |                       | 16.3.21            |               |                      |
|                                                       |                       | Before harvest     | 16.11.21      | -9.51                |
|                                                       |                       | 16.3.21            |               |                      |
|                                                       |                       | Before harvest     | 5.5.22        | -10.95               |
|                                                       |                       | 16.3.21            |               |                      |
|                                                       |                       | After harvest      | 12.5.21       | -2.02                |
|                                                       |                       | 16.3.21            |               |                      |
|                                                       |                       | After harvest      | 14.9.21       | -19.62               |
|                                                       |                       | 16.3.21            |               |                      |
|                                                       |                       | After harvest      | 16.11.21      | -28.09               |
|                                                       |                       | 16.3.21            |               |                      |
|                                                       |                       | After harvest      | 5.5.22        | -29.52               |
|                                                       |                       | 16.3.21            |               |                      |
|                                                       |                       | 12.5.21            | 14.9.21       | -17.60               |
|                                                       |                       | 12.5.21            | 16.11.21      | -26.07               |

|                     |                |                                                                 |           |           |                      |                   |
|---------------------|----------------|-----------------------------------------------------------------|-----------|-----------|----------------------|-------------------|
|                     |                | 12.5.21                                                         | 5.5.22    | -27.51    | <b>0.041</b>         |                   |
|                     |                | 14.9.21                                                         | 16.11.21  | -8.47     | <b>0.010</b>         |                   |
|                     |                | 14.9.21                                                         | 5.5.22    | -9.91     | 0.996                |                   |
|                     |                | 16.11.21                                                        | 5.5.22    | -1.44     |                      |                   |
| Treatment x<br>Time | LME<br>ANOVA   | F (15,69) = 5.1511                                              |           |           | <b>P &lt; 0.0001</b> |                   |
|                     | Tukey’s<br>PWC | <b>Time</b>                                                     | <b>T1</b> | <b>T2</b> | <b>Estimate</b>      | <b>P</b>          |
|                     |                | Before<br>harvest<br>16.3.21                                    | control   | full      | -3.250               | 0.938             |
|                     |                |                                                                 | control   | thinning  | -1.250               | 0.996             |
|                     |                |                                                                 | control   | tips      | -1.250               | 1.000             |
|                     |                |                                                                 | full      | third     | 2.000                | 0.985             |
|                     |                |                                                                 | full      | tips      | 3.500                | 0.925             |
|                     |                |                                                                 | thinning  | tips      | 1.500                | 0.993             |
|                     |                | After harvest<br>16.3.21                                        | control   | full      | 49.063               | <b>&lt;0.0001</b> |
|                     |                |                                                                 | control   | thinning  | 12.156               | 0.145             |
|                     |                |                                                                 | control   | tips      | 12.344               | 0.135             |
|                     |                |                                                                 | full      | third     | -36.906              | <b>&lt;0.0001</b> |
|                     |                |                                                                 | full      | tips      | -36.719              | <b>&lt;0.0001</b> |
|                     |                |                                                                 | thinning  | tips      | 0.188                | 1.000             |
|                     |                | 12.5.21                                                         | control   | full      | 35.469               | <b>&lt;0.0001</b> |
|                     |                |                                                                 | control   | thinning  | 10.281               | 0.269             |
|                     |                |                                                                 | control   | tips      | 6.625                | 0.643             |
|                     |                |                                                                 | full      | third     | -25.188              | <b>0.0002</b>     |
|                     |                |                                                                 | full      | tips      | -28.844              | <b>&lt;0.0001</b> |
|                     |                |                                                                 | thinning  | tips      | -3.656               | 0.915             |
|                     |                | 14.9.21                                                         | control   | full      | 6.250                | 0.684             |
|                     |                |                                                                 | control   | thinning  | 0.531                | 0.100             |
|                     |                |                                                                 | control   | tips      | -1.810               | 0.988             |
|                     |                |                                                                 | full      | third     | -5.719               | 0.740             |
|                     |                |                                                                 | full      | tips      | -8.063               | 0.483             |
|                     |                |                                                                 | thinning  | tips      | -2.344               | 0.976             |
|                     |                | 16.11.21 + 5.5.22 No significant differences between treatments |           |           |                      |                   |

Supplementary table 2.g. Isefjorden. Second harvest UAV-based areal cover (%). T1 and T2 indicates the two treatments compared. Text in bold indicates significant differences in the relevant parameter between the different fixed effects. For significant test results the accompanying pair wise comparisons (PWC) are shown with bold text indicating significant differences between pair wise comparisons.

| Fixed effects                                      | Test type and results |                    |               |                  |
|----------------------------------------------------|-----------------------|--------------------|---------------|------------------|
| Original treatment (control, tips, thinning, full) | ANOVA                 | F (3,24) = 3.752   |               | <b>P = 0.024</b> |
|                                                    |                       | <b>T1</b>          | <b>T2</b>     | <b>Estimate</b>  |
|                                                    |                       | control            | full          | -4.063           |
|                                                    |                       | control            | thinning      | 4.625            |
|                                                    |                       | control            | tips          | -2.000           |
|                                                    |                       | full               | thinning      | 8.688            |
|                                                    |                       | full               | tips          | 2.063            |
|                                                    |                       | thinning           | tips          | -6.625           |
| Time                                               |                       | F (1,24) = 875.665 |               | <b>P = 0.021</b> |
|                                                    |                       | <b>T1</b>          | <b>T2</b>     | <b>Estimate</b>  |
|                                                    |                       | Before harvest     | After harvest | -56.734          |
| Treatment x Time                                   |                       | F (3,24) = 1.782   |               | P = 0.177        |

Supplementary table 2.h. Visual and UAV based areal cover (%). Fixed effects: Areal cover (%) estimate (visual, UAV-based)

| Test type and results |            |           |
|-----------------------|------------|-----------|
| Wilcoxon              | W = 3726.5 | P = 0.135 |

Supplementary table 3. *Fucus vesiculosus* tissue contents of iodine, total arsenic, cadmium, mercury, lead, dry matter (DM), nitrogen (N), carbon (C), phosphorus (P) and ash for all harvest treatments (tips, thinning or full harvest) for all campaigns, Begtrup, Knebel and Isefjorden, at selected dates. FW = fresh weight. DM = dry matter. Limit values of selected elements according to the EU legislation for dietary supplements (EU 2023) and legislation in France (Burtin 2003) and the U.S.A. (Mabeau and Fleurence 1993). Note that the full harvest of every third individual and full harvest of all are similar for the purpose of tissue contents. Data are presented as mean values  $\pm$  standard deviation (n=3).

| Location<br>and date       | Treatment<br>(harvest) | Iodine<br>(mg/kg<br>DM) | Arsenic<br>(mg/kg<br>DM)      | Cadmium<br>(mg/kg<br>DM) | Mercury<br>(mg/kg<br>DM) | Lead<br>(mg/kg<br>DM)  | DM<br>(%FW)             | N<br>(%DM)             | C<br>(%DM)               | P<br>(%DM)             | Ash<br>(%DM)            |
|----------------------------|------------------------|-------------------------|-------------------------------|--------------------------|--------------------------|------------------------|-------------------------|------------------------|--------------------------|------------------------|-------------------------|
| Begtrup<br>(01.11.2018)    | Full                   | 391 $\pm$ 8             | 33.3 $\pm$ 4.3                | 0.63<br><br>$\pm$ 0.19   |                          | 0.63<br><br>$\pm$ 0.12 | 25.11<br><br>$\pm$ 1.54 | 2.58<br><br>$\pm$ 0.12 | 37.01<br><br>$\pm$ 0.31  | 0.14<br><br>$\pm$ 0.01 | 31.07<br><br>$\pm$ 1.82 |
|                            | Tips                   | 397 $\pm$ 7             | 31.9 $\pm$ 1.3                | 0.38<br><br>$\pm$ 0.02   |                          | 0.69<br><br>$\pm$ 0.09 | 17.79<br><br>$\pm$ 1.36 | 1.06<br><br>$\pm$ 0.06 | 29.75<br><br>$\pm$ 1.93  | 0.17<br><br>$\pm$ 0.01 | 32.81<br><br>$\pm$ 1.77 |
| Isefjorden<br>(21.03.2021) | Full                   | 303 $\pm$ 10            | 30.1 $\pm$ 0.9                | 0.75<br><br>$\pm$ 0.02   | 0.13 $\pm$ 0.01          | 0.63<br><br>$\pm$ 0.05 | 33.34<br><br>$\pm$ 3.36 | 2.59<br><br>$\pm$ 0.25 | 39.60<br><br>$\pm$ 0.13  | 0.28<br><br>$\pm$ 0.01 |                         |
|                            | Tips                   | 376 $\pm$ 66            | 37.5 $\pm$ 0.5                | 0.80<br><br>$\pm$ 0.01   | 0.25 $\pm$ 0.14          | 0.60<br><br>$\pm$ 0.08 | 32.11<br><br>$\pm$ 3.17 | 2.30<br><br>$\pm$ 0.16 | 34.64<br><br>$\pm$ 2.28  | 0.36<br><br>$\pm$ 0.01 |                         |
| Knebel<br>(14.05.2020)     | Full                   | 245 $\pm$ 22            | 19.4 $\pm$ 1.1                | 0.60<br><br>$\pm$ 0.08   | 0.18 $\pm$ 0.02          | 0.54<br><br>$\pm$ 0.18 | 25.13<br><br>$\pm$ 0.80 | 0.70<br><br>$\pm$ 0.11 | 49.85<br><br>$\pm$ 22.25 | 0.17<br><br>$\pm$ 0.01 |                         |
|                            | Tips                   | 171 $\pm$ 2             | 23.5 $\pm$ 1.0                | 0.46<br><br>$\pm$ 0.01   | 0.40 $\pm$ 0.21          | 5.01<br><br>$\pm$ 0.85 | 20.44<br><br>$\pm$ 1.96 | 1.36<br><br>$\pm$ 0.44 | 34.23<br><br>$\pm$ 2.52  | 0.16<br><br>$\pm$ 0.01 |                         |
| Knebel<br>(14.08.2020)     | Full                   |                         | 14.1 $\pm$ 1.1                | 0.40<br><br>$\pm$ 0.04   | 0.11 $\pm$ 0.02          | 0.23<br><br>$\pm$ 0.01 | 24.39<br><br>$\pm$ 4.50 | 0.65<br><br>$\pm$ 0.06 | 37.25<br><br>$\pm$ 1.57  | 0.14<br><br>$\pm$ 0.01 |                         |
|                            | Tips                   |                         | 10.3 $\pm$ 0.1                | 0.26<br><br>$\pm$ 0.01   | 0.33 $\pm$ 0.15          | 0.20<br><br>$\pm$ 0.02 | 33.08<br><br>$\pm$ 1.39 | 2.91<br><br>$\pm$ 0.28 | 44.13<br><br>$\pm$ 4.76  | 0.17<br><br>$\pm$ 0.02 |                         |
| Knebel<br>(13.11.2020)     | Tips                   |                         | 23.0 $\pm$ 1.4                | 0.63<br><br>$\pm$ 0.04   | 0.23 $\pm$ 0.10          | 0.27<br><br>$\pm$ 0.03 | 24.21<br><br>$\pm$ 0.90 | 3.51<br><br>$\pm$ 0.94 | 53.52<br><br>$\pm$ 13.45 | 0.34<br><br>$\pm$ 0.03 |                         |
| Knebel<br>(21.03.2021)     | Full                   | 226 $\pm$ 25            | 27.4 $\pm$ 0.7                | 0.57<br><br>$\pm$ 0.02   | 0.28 $\pm$ 0.07          | 0.17<br><br>$\pm$ 0.02 | 22.00<br><br>$\pm$ 0.95 | 2.14<br><br>$\pm$ 0.25 | 37.67<br><br>$\pm$ 2.95  | 0.24<br><br>$\pm$ 0.01 |                         |
|                            | Tips                   | 290 $\pm$ 36            | 25.2 $\pm$ 1.5                | 0.59<br><br>$\pm$ 0.02   | 0.41 $\pm$ 0.10          | 0.23<br><br>$\pm$ 0.03 | 29.52<br><br>$\pm$ 0.19 | 1.73<br><br>$\pm$ 0.10 | 37.84<br><br>$\pm$ 3.21  | 0.23<br><br>$\pm$ 0.01 |                         |
| <b>Limit<br/>values</b>    |                        | <b>6</b>                | <b>&lt;3.0</b><br>(Inorganic) | <b>&lt;3.0</b>           | <b>&lt;0.1</b>           | <b>&lt;3.0</b>         |                         |                        |                          |                        |                         |

Supplementary table 4. Chemical composition statistical summary table. Text in bold indicates significant differences in tissue composition between biomass harvested by tips harvest (the most new and distal biomass) or full harvest (total biomass including the old and more proximal biomass).

| Parameter | Fixed effect           |          | Test type and results |                     |
|-----------|------------------------|----------|-----------------------|---------------------|
| DM        | Treatment (tips, full) | T-test   | T (30.654) = -0.10447 | P = 0.9175          |
| Ash       | Treatment (tips, full) | T-test   | T (3.9964) = -1.881   | P = 0.3006          |
| C         | Treatment (tips, full) | Wilcoxon | W = 142               | P = 0.5559          |
| N         | Treatment (tips, full) | Wilcoxon | W = 104               | P = 0.414           |
| P         | Treatment (tips, full) | Wilcoxon | W = 87                | P = 0.08591         |
| I         | Treatment (tips, full) | Wilcoxon | W = 62                | P = 0.5834          |
| As        | Treatment (tips, full) | Wilcoxon | W = 132               | P = 0.928           |
| Cd        | Treatment (tips, full) | T-test   | T (30.968) = 1.2411   | P = 0.2239          |
| Hg        | Treatment (tips, full) | Wilcoxon | W = 32                | <b>P = 0.005021</b> |
| Pb        | Treatment (tips, full) | Wilcoxon | W = 121               | P = 0.6255          |

## References

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